

ECONOMIC SCIENCE FOR RURAL DEVELOPMENT

Proceedings of the
International Scientific Conference

No 45 Integrated and Sustainable Regional Development
Marketing and Sustainable Consumption

No 45

Jelgava

2017

ISSN 1691-3078

ISSN 2255-9930 on line

ISBN 978-9984-48-261-3

Abstracted / Indexed: ISI Web of Science, AGRIS, CAB Abstracts, EBSCOHost Academic Search Complete databases and Google Scholar

<http://www.esaf.llu.lv/journals-and-proceedings>

<https://apps.webofknowledge.com/>

www.fao.org/agris/

<https://www.cabdirect.org/>

<http://search.ebscohost.com/login.aspx?direct=true&db=a9h&jid=25AP&site=ehost-live>

<https://scholar.google.lv/>

Programme Committee of International Scientific Conference

| | | |
|----------------------------|---------------------------------|--|
| <i>Professor</i> | Baiba Rivza | Latvia University of Agriculture, Latvia |
| <i>Professor</i> | Andra Zvirbule | Latvia University of Agriculture, Latvia |
| <i>Professor</i> | Irina Pilvere | Latvia University of Agriculture, Latvia |
| <i>Professor</i> | Barbara Freytag-Leyer | Fulda University of Applied Sciences, Germany |
| <i>Professor</i> | Bo Ohlmer | Swedish University of Agricultural Sciences, Sweden |
| <i>Professor</i> | Wim J.M. Heijman | Wageningen University, the Netherlands |
| <i>Professor</i> | Bartosz Mickiewicz | West Pomeranian University of Technology, Poland |
| <i>Professor</i> | Maria Parlinska | Warsaw University of Life Sciences - SGGW, Poland |
| <i>Professor</i> | Alina Danilowska | Warsaw University of Life Sciences - SGGW, Poland |
| <i>Professor</i> | Janina Sawicka | Warsaw University of Life Sciences - SGGW, Poland |
| <i>Professor</i> | Joanna Szwacka-Mokrzycka | Warsaw University of Life Sciences - SGGW, Poland |
| <i>Professor</i> | Jacques Viaene | University of Gent, Belgium |
| <i>Professor</i> | Arild Sæther | University of Agder, Norway |
| <i>Professor</i> | Vilija Alekneviene | Aleksandras Stulginskis University, Lithuania |
| <i>Professor</i> | Rogier Schulte | Teagasc -The Agriculture and Food Development Authority of Ireland, Ireland |
| <i>Professor</i> | Csaba Forgacs | Budapest Corvinus University, Hungary |
| <i>Professor</i> | Elena Horska | Slovak University of Agriculture, Slovakia |
| <i>Senior researcher</i> | Magnar Forbord | Centre for Rural Research, Norway |
| <i>Professor</i> | Ingrida Jakusonoka | Latvia University of Agriculture, Latvia |
| <i>Professor</i> | Aina Dobeles | Latvia University of Agriculture, Latvia |
| <i>Professor</i> | Modrite Pelse | Latvia University of Agriculture, Latvia |
| <i>Associate professor</i> | Gunita Mazure | Latvia University of Agriculture, Latvia |
| <i>Associate professor</i> | Janis Kuisis | Latvia University of Agriculture, Latvia |
| <i>Associate professor</i> | Anita Auzina | Latvia University of Agriculture, Latvia |
| <i>Associate professor</i> | Gunta Grinberga-Zalite | Latvia University of Agriculture, Latvia |
| <i>Assistant professor</i> | Dina Popluga | Latvia University of Agriculture, Latvia |

Time schedule of the conference

Preparation of the proceedings and organization: December 2016 – April 2017

Conference: 27-28 April 2017

Researchers from the following higher education institutions, research institutions, and professional organizations presented their scientific papers at the conference:

| | |
|--|-----------|
| Agency for Restructuring and Modernisation of Agriculture in Leczna | Poland |
| AGH University of Science and Technology | Poland |
| Aleksandras Stulginskis university | Lithuania |
| BA School of Business and Finance | Latvia |
| College of Law | Latvia |
| Estonian University of Life Sciences | Estonia |
| Gdynia Maritime University | Poland |
| Groupe ESC Troyes | France |
| Institute of Agricultural Resources and Economics | Latvia |
| Institute of Soil Science and Plant Cultivation State Research Institute | Poland |
| Kaunas University of Technology | Lithuania |
| Kuban State University | Russia |
| Latvia University of Agriculture | Latvia |
| Lithuanian Institute of Agrarian Economics | Lithuania |
| Maxwell School of Syracuse University | USA |
| Pennsylvania State University | USA |
| Plekhanov Russian University of Economics | Russia |
| Pope John Paul II State School of Higher Education in Biala Podlaska | Poland |
| Poznan University of Economics and Business | Poland |
| Rezekne Higher Education Institution | Latvia |
| Riga Teacher Training and Educational Management Academy | Latvia |
| Riga Technical University | Latvia |
| "RISEBA" University of Business, Arts and Technology | Latvia |
| Russian State Agrarian University - Moscow Timiryazev Agricultural Academy | Russia |
| Samara State University of Economics | Russia |
| Slovak University of Agriculture in Nitra | Slovakia |
| St. Francis Xavier University | Canada |
| State Employment Agency of Latvia | Latvia |
| State Revenue Service of the Republic of Latvia | Latvia |
| State University of Applied Sciences in Konin | Poland |
| Sumy State University | Ukraine |
| Siauliai University | Lithuania |
| Tallinn University of Technology | Estonia |
| The General Jonas Zemaitis Military Academy of Lithuania | Lithuania |
| The State University of Applied Sciences in Elblag | Poland |
| The University of Economics and Culture | Latvia |
| Transilvania University of Brasov | Romania |
| Turiba University Ltd | Latvia |
| University of Agriculture in Krakow | Poland |
| University of Latvia | Latvia |
| University of Warmia and Mazury in Olsztyn | Poland |
| UTP University of Science and Technology | Poland |
| Vidzeme University of Applied Sciences | Latvia |
| Vilnius Gediminas Technical University | Lithuania |
| Vytautas Magnus University | Lithuania |
| Warsaw University of Life Sciences – SGGW | Poland |
| West Pomeranian University of Technology Szczecin | Poland |

Editorial Board

The Editorial Board of the edition of the International Scientific Conference Proceedings:

| | | |
|------------------|------------------------------|--|
| <i>Professor</i> | Vilija Alekneviene | Aleksandras Stulginskis University, Lithuania |
| <i>Professor</i> | Alina Danilowska | Warsaw University of Life Sciences - SGGW, Poland |
| <i>Professor</i> | Csaba Forgacs | Budapest Corvinus University, Hungary |
| <i>Professor</i> | Barbara Freytag-Leyer | Fulda University of Applied Sciences, Germany |
| <i>Professor</i> | Wim J.M. Heijman | Wageningen University, the Netherlands |
| <i>Professor</i> | Elena Horska | Slovak University of Agriculture, Slovakia |
| <i>Professor</i> | Bartosz Mickiewicz | West Pomeranian University of Technology, Poland |
| <i>Professor</i> | Bo Ohlmer | Swedish University of Agricultural Sciences, Sweden |
| <i>Professor</i> | Maria Parlinska | Warsaw University of Life Sciences - SGGW, Poland |
| <i>Professor</i> | Irina Pilvere | Latvia University of Agriculture, Latvia |
| <i>Professor</i> | Baiba Rivza | Latvia University of Agriculture, Latvia |
| <i>Professor</i> | Arild Sæther | University of Agder, Norway |
| <i>Professor</i> | Rogier Schulte | Teagasc -The Agriculture and Food Development Authority of Ireland, Ireland |
| <i>Professor</i> | Jacques Viaene | University of Gent, Belgium |
| <i>Professor</i> | Andra Zvirbule | Latvia University of Agriculture, Latvia |

Editor – in-chief

Anita Auzina, Associate professor

Responsible compilers of the proceedings:

Gunta Grinberga-Zalite, Associate professor

Simona Zvirgzdina, Lecturer

Assistants to the responsible compilers:

Dzesija Zeiferte

The authors are responsible for the content and language of their papers.

Reviewers

Every article included into the Proceedings was subjected to a scientific, including international review.

All reviewers were anonymous for the authors of the articles.

The following 105 reviewers from scientific and academic institutions of 8 countries (Estonia, Germany, Latvia, Lithuania, Poland, Russia, Slovakia and USA) have written 105 reviews.

| | |
|-------------------------------|--|
| Gita Actina | <i>Dr.oec.</i> , researcher of energy sector, Institute of Physical Energetics, Latvia |
| Mieczysław Adamowicz | <i>Dr.hab., prof.</i> ; Pope John Paul II State School of Higher Education in Biala Podlaska, Poland |
| Liena Adamsone | <i>Dr.oec.</i> , Riga Technical University, Entrepreneurship development specialist, Latvia |
| Rolan Alborov | <i>Dr.sc., prof.</i> ; Izhevsk State Agricultural Academy, Russia |
| Sandris Ancans | <i>Mg.oec.</i> ; Latvia University of Agriculture, Latvia |
| Dzintra Atstaja | <i>Dr.oec., prof.</i> ; BA School of Business and Finance, Latvia |
| Anita Auzina | <i>Dr.oec., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Alberts Auzins | <i>Dr.oec.</i> ; "Edo Consult" Ltd, Latvia |
| Voldemars Bariss | <i>Dr.phil., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Baiba Bela | <i>Dr.sc.soc., assoc.prof.</i> ; University of Latvia, Latvia |
| Iluta Berzina | <i>Dr.oec.</i> , Latvian Council of Science expert in economics, Latvia |
| Laima Berzina | <i>Dr.sc.ing., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Dina Bite | <i>Dr.sc.soc., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Denisow Bozena | <i>Dr.hab.</i> ; University of Life Sciences in Lublin, Poland |
| Agnieszka Brelik | <i>Dr.hab., prof.</i> ; West Pomeranian University of Technology Szczecin, Poland |
| Zane Bulderberga | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Ceslovas Christauskas | <i>Dr., assoc.prof.</i> ; Kaunas University of Applied Sciences, Lithuania |
| Bozena Denisow | <i>Dr.hab., PhD</i> , University of Life Sciences in Lublin, Poland |
| Konstantins Didenko | <i>Dr., prof.</i> , Corresponding member of LAS, LSC expert, Latvia |
| Aina Dobeļe | <i>Dr.oec., prof.</i> ; Latvia University of Agriculture, Latvia |
| Signe Dobelniece | <i>Dr.phil.soc.d., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Nina Drejerska | <i>Dr.</i> ; Warsaw University of Life Sciences – SGGW, Poland |
| Hanna Dudek | <i>Dr.hab.</i> , Warsaw University of Life Sciences – SGGW, Poland |
| Aija Eglite | <i>Dr.oec., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Barbara Golebiewska | <i>Dr.hab., prof.</i> ; Warsaw University of Life Sciences – SGGW, Poland |
| Gunta Grinberga-Zalite | <i>Dr.oec., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Anda Grinfelde | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Mariola Grzybowska-Brzezinska | <i>Dr.hab.</i> ; University of Warmia and Mazury in Olsztyn, Poland |
| Elena Horska | <i>Dr.ing., prof.</i> ; Slovak University of Agriculture in Nitra, Slovakia |
| Jan Hybel | <i>Dr.hab., prof.</i> ; University of Computer Sciences and Economics in Olsztyn, Poland |
| Ingrida Jakusonoka | <i>Dr.oec., prof.</i> ; Latvia University of Agriculture, Latvia |
| Liga Jankava | <i>Dr.oec.</i> ; Riga Teacher Training and Educational Management Academy, Latvia |
| Elita Jermolajeva | <i>Dr.oec.</i> ; Member of Latvia Academy of Agricultural and Forestry Sciences, Latvia |
| Laima Jeseviciute-Ufartiene | <i>Dr.oec., assoc.prof., phd</i> ; Kauko kolegija university of applied science, Lithuania |
| Helma Jirgena | <i>Dr.oec.</i> ; Latvian Academy of Sciences, Latvia |
| Inguna Jurgelane | <i>Dr.oec., assoc.prof.</i> ; Riga Technical University, Latvia |
| Inara Jurgena | <i>Dr.oec., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Dace Kaufmane | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Stanislavs Keiss | <i>Dr.oec., prof.</i> ; University College of Economic and Culture, Latvia |
| Kitija Kirila | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Grzegorz Koszela | <i>Dr.inz., PhD</i> ; Warsaw University of Life Sciences – SGGW, Poland |
| Zaiga Krisjane | <i>Dr.geogr., Prof.</i> ; University of Latvia, Latvia |
| Ginta Kronberga | <i>Dr.sc.soc., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Zenija Kruzmetra | <i>Dr.geogr., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Krystyna Krzyzanowska | <i>Dr.hab., prof.</i> ; Warsaw University of Life Sciences – SGGW, Poland |
| Ivars Kudrenickis | <i>Dr.ing., assoc.prof.</i> ; University of Latvia, Latvia |
| Piotr Kulyk | <i>Dr.hab.inz.</i> ; University of Zielona Gora, Poland |
| Janis Kusis | <i>Dr.hist., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Inguna Leibus | <i>Dr.oec., prof.</i> ; Latvia University of Agriculture, Latvia |
| Maira Lescevicā | <i>Dr.oec., assoc.prof.</i> ; Vidzeme University of Applied Sciences, Latvia |

| | |
|---------------------------------|--|
| Lasma Licite | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Evija Liepa | <i>Dr.math., assist.prof.</i> ; Latvian Business College, Latvia |
| Nina Linde | <i>PhD</i> ; Latvian Academy of Sciences, Latvia |
| Antra Line | <i>Dr.sc.admin., assist.prof.</i> ; Riga Teacher Training and Educational Management Academy, Latvia |
| Ausra Liucvaitiene | <i>Dr., assoc.prof.</i> ; Vilnius Gediminas Technical University, Lithuania |
| Agita Livina | <i>Dr.oec., prof., researcher</i> ; Vidzeme University of Applied Sciences, Latvia |
| Wieslawa Lizinska | <i>Dr.hab.</i> ; University of Warmia and Mazury in Olsztyn, Poland |
| Iveta Magone | <i>Dr.sc.administr.</i> , "ALGAR" Ltd. Leading researcher, Latvia |
| Gunita Mazure | <i>Dr.oec., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Ligita Melece | <i>Dr.oec., assoc.prof.</i> ; Institute of Agricultural Resources and Economics, Latvia |
| Astrida Miceikiene | <i>Dr., prof.</i> ; Aleksandras Stulginskis university, Lithuania |
| Bartosz Mickiewicz | <i>Dr.oec., prof.</i> ; West Pomeranian University of Technology Szczecin, Poland |
| Antoni Mickiewicz | <i>Dr.hab., prof.</i> ; West Pomeranian University of Technology Szczecin, Poland |
| Ingrida Millere | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Jolanta Millere | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Aina Muska | <i>Dr.oec., assoc.prof.</i> ; Latvia University of Agriculture, Latvia |
| Kaspars Naglis-Liepa | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Dionizy Niezgodza | <i>Dr.hab., prof.</i> ; University of Life Sciences in Lublin, Poland |
| Czeslaw Nowak | <i>Prof.</i> ; University of Agriculture in Krakow, Poland |
| Inta Ostrovskā | <i>Dr.paed.</i> ; Daugavpils University, Latvia |
| Onnela Paas | <i>PhD</i> ; Tallinn University of Technology, Working in ABB Estonia, as Health safety and Environment Adviser, Estonia |
| Irena Pekarskiene | <i>Dr., prof.</i> ; Kaunas University of Technology, Lithuania |
| Modrite Pelse | <i>Dr.oec., prof.</i> ; Latvia University of Agriculture, Latvia |
| Irina Pilvere | <i>Dr.oec., prof.</i> ; Latvia University of Agriculture, Latvia |
| Dina Popluga | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Ivan Potravny | <i>Dr.oec., prof.</i> ; Plekhanov Russian University of Economics, Russia |
| Līga Proskina | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Feliciana Rajevska | <i>Dr.pol.sc., assoc.prof.</i> ; Vidzeme University of Applied Sciences, Latvia |
| Līga Rasnaca | <i>Dr.sc.soc., assist.prof.</i> ; University of Latvia, Latvia |
| Baiba Rivza | <i>Dr.oec., prof.</i> ; Latvia University of Agriculture, Latvia |
| Sarmite Rozentale | <i>Dr.oec., prof.</i> ; Vidzeme University of Applied Sciences, Latvia |
| Ritma Rungule | <i>Dr.sc.soc., assoc.prof.</i> ; Riga Stradins University, Latvia |
| Svetlana Saksonova | <i>Dr.oec., prof.</i> ; University of Latvia, Latvia |
| Kalev Sepp | <i>PhD, Head of department</i> ; Estonian University of Life Sciences, Estonia |
| Anita Sidelska | <i>Dr.oec.; researcher</i> , Latvia University of Agriculture, Latvia |
| Linda Silina | <i>Dr.oec.</i> ; Latvian Rural Advisory and Training Centre, Latvia |
| Peteris Skinkis | <i>Dr., assoc.prof.</i> ; University of Latvia, Latvia |
| Romēna Sulca | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Maria Ewa Szatlach | <i>Prof.</i> ; Kazimierz Wielki University, Poland |
| Iwona Szczepaniak | <i>PhD, Head of Food Economics Department, Institute of Agricultural and Food Economics – National Research Institute, Warsaw, Poland</i> |
| Tatjana Tambovceva | <i>Dr.oec., prof.</i> ; Riga Technical University, Latvia |
| Jelena Titko | <i>Dr.oec., asspc.prof.</i> ; The University of Economics and Culture, Latvia |
| Anastasija Vilcina | <i>Dr.oec., prof.</i> ; Latvia University of Agriculture, Latvia |
| Inga Vilka | <i>Dr.oec.</i> ; University of Latvia, Latvia |
| Lolita Vilka | <i>Assoc.prof.</i> ; Riga Stradins University, Latvia |
| Alise Vitola | <i>Dr.oec.</i> , Research Fellow, Freie Universität Berlin, Germany |
| Kazimierz Wackowski | <i>Dr.hab., assoc.prof.</i> ; Warsaw University of Technology, Poland President of the Association of World Citizens, an international peace organization with consultative status with ECOSOC, the United Nations organ facilitating international cooperation on and problem-solving in economic and social issues. USA |
| Rene Wadlow | |
| Bogdan Wawrzyniak | <i>Dr.hab., prof.</i> ; University of Science and Technology in Bydgoszcz, Poland |
| Andrzej Piotr Wiatrak | <i>Dr.hab., prof.</i> ; University of Warsaw, Poland |
| Agnieszka Wojewodzka-Wiewiorska | <i>PhD</i> ; Warsaw University of Life Sciences – SGGW, Poland |
| Sandija Zeverte-Rivza | <i>Dr.oec., assist.prof.</i> ; Latvia University of Agriculture, Latvia |
| Aija Zobena | <i>Dr.sc.soc., prof.</i> ; University of Latvia, Latvia |
| Sergey Zudilin | <i>Doctor of agricultural sciences, prof.</i> ; Federal State Budgetary Educational Institution of Higher Education "Samara state agricultural academy", Russia |
| Andra Zvirbule | <i>Dr.oec., prof.</i> ; Latvia University of Agriculture, Latvia |

Publication Ethics and Malpractice Statement for the International Scientific Conference "Economic Science for Rural Development"

The Editorial Board is responsible for, among other, preventing publication malpractice. Unethical behaviour is unacceptable and the authors who submit articles to the Conference Proceedings affirm that the content of a manuscript is original. Furthermore, the authors' submission also implies that the material of the article was not published in any other publication; it is not and will not be presented for publication to any other publication; it does not contain statements which do not correspond to reality, or material which may infringe upon the intellectual property rights of another person or legal entity, and upon the conditions and requirements of sponsors or providers of financial support; all references used in the article are indicated and, to the extent the article incorporates text passages, figures, data or other material from the works of others, the undersigned has obtained any necessary permits as well as the authors undertake to indemnify and hold harmless the publisher of the proceedings and third parties from any damage or expense that may arise in the event of a breach of any of the guarantees.

Editors, authors, and reviewers, within the International Scientific Conference "**Economic Science for Rural Development**" are to be fully committed to good publication practice and accept the responsibility for fulfilling the following duties and responsibilities, as set by the *COPE Code of Conduct and Best Practice Guidelines for Journal Editors of the Committee on Publication Ethics (COPE)*.

It is necessary to agree upon standards of expected ethical behaviour for all parties involved in the act of publishing: the author, the editor, the peer reviewer, and the publisher.

DUTIES OF EDITORS

Publication decisions

The Editorial Board is responsible for deciding which of the articles submitted to the Conference Proceedings should be published. The Editorial Board may be guided by the policies of ethics and constrained by such legal requirements as shall then be in force regarding libel, copyright infringement and plagiarism. The editor may confer with other editors or reviewers in making this decision.

Fair play

An editor at any time evaluate manuscripts for their intellectual content without regard to the nature of the authors or the host institution including race, gender, sexual orientation, religious belief, ethnic origin, citizenship, or political philosophy of the authors.

Confidentiality

The editor and any editorial staff must not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher, as appropriate.

Disclosure and conflicts of interest

Unpublished materials disclosed in a submitted manuscript must not be used in an editor's own research without the express written consent of the author.

DUTIES OF REVIEWERS

Every submitted manuscript has been reviewed by one reviewer from the author's native country or university, while the other reviewer came from another country or university. The third reviewer was chosen in the case of conflicting reviews. All reviewers were anonymous for 9 the authors of the articles, and the reviewers presented blind reviews. Every author received the reviewers' objections or recommendations. After receiving the improved (final) version of the manuscript and the author's comments, the Editorial Board of the conference evaluated each article.

Contribution to editorial decisions

Peer review assists the editor in making editorial decisions and through the editorial communications with the author may also assist the author in improving the paper.

Promptness

Any selected referee who feels unqualified to review the research reported in a manuscript or knows that its prompt review will be impossible should notify the editor and excuse himself from the review process.

Confidentiality

Any manuscripts received for review must be treated as confidential documents. They must not be shown to or discussed with others except as authorised by the editor.

Standards of objectivity

Reviews should be conducted objectively. Personal criticism of the author is inappropriate. Referees should express their views clearly with supporting arguments.

Acknowledgement of sources

Reviewers should identify relevant published work that has not been cited by the authors. Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation. A reviewer should also call to the editor's attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.

Disclosure and conflict of interest

Privileged information or ideas obtained through peer review must be kept confidential and not used for personal advantage. Reviewers should not consider manuscripts in which they have conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies, or institutions connected to the papers.

DUTIES OF AUTHORS

Reporting standards

The authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance. Underlying data should be represented accurately in the paper. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behaviour and are unacceptable.

Data access and retention

The authors are asked to provide the raw data in connection with a paper for editorial review, and should be prepared to provide public access to such data (consistent with the ALPSP-STM Statement on Data and Databases), if practicable, and should in any event be prepared to retain such data for a reasonable time after publication.

Originality and plagiarism

The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted.

Multiple, redundant or concurrent publication

An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Submitting the same manuscript to more than one journal concurrently constitutes unethical publishing behaviour and is unacceptable.

Acknowledgement of sources

Proper acknowledgment of the work of others must always be given. The authors should cite publications that have been influential in determining the nature of the reported work.

Authorship of the paper

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors.

The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

Hazards and human or animal subjects

If the work involves chemicals, procedures or equipment that have any unusual hazards inherent in their use, the author must clearly identify these in the manuscript.

Disclosure and conflicts of interest

All authors should disclose in their manuscript any financial or other substantive conflict of interest that might be construed to influence the results or interpretation of their manuscript. All sources of financial support for the project should be disclosed.

Fundamental errors in published works

When an author discovers a significant error or inaccuracy in his/her own published work, it is the author's obligation to promptly notify the editor or publisher and cooperate with the editor to retract or correct the paper.

Editorial Board

Foreword

The international scientific conference "Economic Science for Rural Development" is organized annually by the Faculty of Economics and Social Development of Latvia University of Agriculture.

The proceedings of the conference are published since 2000.

The scientific papers presented in the conference held on 27-28 April 2017 are published in 3 thematic volumes:

No 44 Rural Development and Entrepreneurship

Bioeconomy

Production and Co-operation in Agriculture

No 45 Integrated and Sustainable Regional Development

Marketing and Sustainable Consumption

No 46 New Dimensions in the Development of Society

Home Economics

Finance and Taxes

The proceedings contain scientific papers representing not only the science of economics in the diversity of its sub-branches, but also other social sciences (sociology, political science), thus confirming interdisciplinary development of the contemporary social science.

This year for the first time the conference includes the section on a new emerging kind of economy-bioeconomy. The aim of bioeconomy is to use renewable biological resources in amore sustainable manner. Bioeconomy can also sustain a wide range of public goods, including biodiversity. It can increase competitiveness, enhance Europe's self-reliance and provide jobs and business opportunities.

The Conference Committee and Editorial Board are open to comments and recommendations concerning the preparation of future conference proceedings and organisation of the conference.

Acknowledgements

The Conference Committee and editorial Board are open to comments and recommendations for the development of future conference proceedings and organisation of international scientific conferences.

We would like to thank all the authors, reviewers, members of the Programme Committee and the Editorial Board as well as supporting staff for their contribution organising the conference.

On behalf of the conference organisers

Anita Auzina

Associate professor of Faculty of Economics and Social Development
Latvia University of Agriculture

Contents

| | |
|--|------------|
| INTEGRATED AND SUSTAINABLE REGIONAL DEVELOPMENT..... | 13 |
| MULTIDIMENSIONAL COMPARATIVE ANALYSIS OF SUSTAINABLE DEVELOPMENT IN EUROPEAN UNION | 14 |
| Bak Iwona ¹ , dr hab.; Cheba Katarzyna ² , dr..... | 14 |
| PROBLEMS OF PRICING AS A COMPETITIVENESS TOOL IN LATVIAN BUSINESS ENVIRONMENT | 21 |
| Ieva Bruksle ¹ , Mg.oec; Rosita Zvirgzdina ² , Dr. oec..... | 21 |
| ASSESSMENT OF BUSINESS PERFORMANCE IN WASTE LANDFILLS AND SHIFTING TOWARDS CIRCULAR ECONOMY. 30 | 30 |
| Natalija Cudecka-Purina ¹ , PhD student; Dzintra Atstaja ² , Dr. professor | 30 |
| ECONOMIZATION OF TOURISM: RESEARCH DISCOURSE..... | 40 |
| Andrzej Czyzewski ¹ , Prof.; Brelik Agnieszka ² Assoc. Prof. | 40 |
| CROSS-BORDER CONTACTS AND COOPERATION BETWEEN POPULATION OF LATVIA, ESTONIA AND RUSSIA: A CASE OF ALUKSNE REGION..... | 48 |
| Santa Daume ¹ , Mg.sc.soc; Aija Zobena ² , Dr.sc.soc., professor | 48 |
| ASSESSMENT OF SPA HOTEL SERVICES' DEVELOPMENT OPPORTUNITIES IN REZEKNE CITY..... | 55 |
| Iveta Dembovska ¹ , Mg.oec./ Lecturer; Lienite Litavniece ² , Dr.oec./ Assistant Prof., Senior researcher; Inese Silicka ³ , Mg.oec./ Lecturer | 55 |
| INTEGRATED COASTAL MANAGEMENT PRACTICE CASE STUDIES: DEFICIENCY OF COLLABORATION COMMUNICATION AND SOCIO-ECOLOGICAL SYSTEM APPROACHES..... | 63 |
| Raimonds Ernsteins ¹ , Dr.habil.paed.; Anita Lontone – Ievina ² , MSc.env.; Erika Lagzdina ³ , MSc.env., Krista Osniece ⁴ , MSc.nat.sc.; Janis Kaulins ⁵ , Dr. geogr.;..... | 63 |
| SMART SPECIALIZATION STRATEGY IN LATVIA, ESTONIA AND LITHUANIA | 71 |
| Sergejs Gemma ¹ , MPA; Zane Bulderberga ² , Dr.oec. | 71 |
| WORK BASED LEARNING PROGRAMMES IN LATVIA | 79 |
| Liene Golca ¹ , Mg.soc.sc; Feliciana Rajevska ² , Dr.pol.sc. | 79 |
| CHANGES IN WASTE MANAGEMENT IN THE EU COUNTRIES | 87 |
| Barbara Golebiewska ¹ , PhD hab., prof. WULS | 87 |
| ASSESSMENT OF THE INTENSITY AND ACTIVITY OF USE OF EU FUNDS IN ZEMGALE REGION | 95 |
| Ingrida Jakusonoka ¹ , Dr.oec., professor; Baiba Rivza ² , Dr.oec., professor | 95 |
| DEVELOPMENT OF THE MANAGEMENT RECOMMENDATIONS FOR THE ACCOMPANYING ADMINISTRATIVE TERRITORIES: CASE OF RIGA | 102 |
| Inga Jekabsons ¹ , Dr.admin.cand.; Biruta Sloka ² , Dr.oec., professor; Ansis Grantins ³ , PhD student..... | 102 |
| METHODOLOGY FOR THE DETERMINATION OF PERI-URBAN AREAS ON THE BASIS OF DATA OF LAND TYPE AND USE BY EXAMPLE OF THE TOWN OF TARTU..... | 110 |
| Evelin Jurgenson ¹ , MSc; Kristiin Sikk ² , MSc; Helena Hass ³ , MSc and Siim Maasikamae ⁴ , PhD | 110 |
| E-GOVERNMENT AND E-PARTICIPATION DEVELOPMENT IN BALTIC STATES: COMPARISON OF ESTONIA, LATVIA, LITHUANIA | 118 |
| Natalija Kostrikova ¹ , MBA; Baiba Rivza ² , Dr.habil.oec..... | 118 |
| REGIONAL TOPICALITIES IN LATVIA: MOBILITY AND IMMOBILITY IN THE COUNTRYSIDE | 127 |
| Zaiga Krisjane ¹ , Dr.geogr., Professor; Elina Apsite–Berina ¹ , Dr.geogr. Researcher; Maris Berzins ¹ , Dr.geogr., Docent; Ineta Grine ¹ , Dr.geogr., Docent | 127 |
| FIREFIGHTING AND RESCUE SOLUTIONS FOR RURAL AREAS OF THE REPUBLIC OF LATVIA | 134 |
| Jelena Malahova ¹ , Dr.oec.,assist. prof.; Janis Ievinsh ² , Dr.oec., prof. and Karlis Ketners ³ , Dr.oec., prof. | 134 |
| USE OF PREVENTIVE MEASURES FOR REDUCTION IN THE NUMBER OF FIRES: POSSIBLE SOLUTIONS | 140 |
| Jelena Malahova ¹ , Dr.oec., assist.prof.; Vladimirs Jemeljanovs ² , Dr.sc.ing., prof. and Karlis Ketners ³ , Dr.oec., prof..... | 140 |
| RENEWABLE SOURCES OF ENERGY IN POLAND AND IN THE REGION – RESEARCH RESULTS | 149 |
| Malgorzata Michalcewicz-Kaniowska ¹ , PhD; Malgorzata Zajdel ² , PhD | 149 |
| SHAPING THE COMMON ORGANISATION OF AGRICULTURAL MARKETS IN THE NEW PROGRAMMING PERIOD (2014 – 2020)..... | 159 |
| Bartosz Mickiewicz ¹ , PhD, Professor, Irina Pilvere ² , PhD, Professor | 159 |
| ECO-MANAGEMENT AND AUDIT SCHEME (EMAS) AS AN IMPORTANT ELEMENT OF THE SUSTAINABLE DEVELOPMENT POLICY ON THE EXAMPLE OF POLAND..... | 168 |
| Janusz Myszczyzyn ¹ , PhD..... | 168 |
| ROLE OF SUPPORT PAYMENTS IN THE DEVELOPMENT OF TERRITORIES IN LATVIA..... | 176 |
| Aleksejs Nipers ¹ , Dr.oec.; Irina Pilvere ² , Dr.oec., Zane Bulderberga ³ , Dr.oec. | 176 |
| RESOURCES OF ENVIRONMENT: ASPECTS OF SMART RURAL DEVELOPMENT | 186 |
| Maira Ore ¹ ; Mg.oec and Vija Melbarde ² , Mg.paed | 186 |
| ETHNOLOGICAL EXPERTISE AS A TOOL OF THE IMPACT ASSESSMENT ON ARCTIC TERRITORIES OF TRADITIONAL LAND USE..... | 196 |
| Ivan Potravnyy ¹ , Dr.oec., professor; Tatjana Tamboveva ² , Dr.oec., professor and Violetta Gassiy ³ , Dr.oec., associate professor..... | 196 |
| DEMAND FOR AND SUPPLY OF HIGHER EDUCATION IN LATVIA..... | 204 |
| Aija Sannikova ¹ , Dr.oec., Tamara Grizane ² , Dr.oec., Aina Dobele ³ , Dr.oec..... | 204 |

| | |
|---|------------|
| WHAT MAKES COUNTRIES TO BE ENERGY EFFICIENT: CASE OF LITHUANIA AND UKRAINE? | 213 |
| Lina Sineviciene ¹ , PhD in Economics; Iryna Sotnyk ² , PhD in Economics; Oleksandr Kubatko ³ , PhD in Economics; Ausrine Lakstutiene ⁴ , PhD in Economics | |
| | 213 |
| PRECONDITIONS FOR ESTABLISHMENT AND HISTORICAL DEVELOPMENT STAGES OF LATVIAN RURAL TOURISM ASSOCIATION "COUNTRY HOLIDAYS" | 221 |
| Juris Smalinskis ¹ , Anita Auzina ² , Dr. oec., Associate Professor | |
| | 221 |
| REGIONAL DISPARITIES IN LEVEL AND DYNAMICS OF GROSS DOMESTIC PRODUCT AT NUTS-3 REGIONS IN CENTRAL EUROPE AND THE BALTIC STATES | 228 |
| Maciej Stawicki ¹ , PhD..... | |
| | 228 |
| ENHANCEMENT OF EMPLOYMENT OPPORTUNITIES FOR THE DISABLED UNEMPLOYED IN ZEMGALE REGION | 235 |
| Anastasija Vilcina ¹ , Dr.oec.; Zane Blumberga ² , Mg.oec. | |
| | 235 |
| ANALYSYS OF SELECTED DETERMINANTS OF THE AGRICULTURAL MARKET IN LATVIA AND POLAND | 242 |
| Anetta Wasniewska ¹ , Ph. D.; Katarzyna Olszewska ² | |
| | 242 |
| ECOLOGICAL EDUCATION FOR SUSTAINABLE DEVELOPMENT OF RURAL AREAS | 250 |
| Izabela Wielewska ¹ , PhD.; Maciej Gliniak ² , PhD. Eng.; Wiktoria Sobczyk ³ , PhD. D.Sc. Eng. Associate Professor; Piotr Prus ⁴ , PhD. Eng..... | |
| | 250 |
| EVALUATION OF THE EFFECTIVENESS OF LOCAL ACTION GROUPS IN THE RURAL AREAS IN THE KUJAWSKO-POMORSKIE – RESEARCH RESULTS | 258 |
| Malgorzata Zajdel ¹ , Ph.D.; Malgorzata Michalcewicz-Kaniowska ² , Ph.D. | |
| | 258 |
| AGRICULTURAL PRODUCTION AND MARKET MODELLING APPROACHES | 267 |
| Sandija Zeverte-Rivza ¹ , Dr.oec.; Aleksejs Nipers ² , Dr.oec.; Irina Pilvere ³ , Dr.oec..... | |
| | 267 |
| MARKETING AND SUSTAINABLE CONSUMPTION | 275 |
| ANALYSIS OF LATVIA INHABITANTS' CONFIDENCE TOWARDS GMO | 276 |
| Inese Aleksejeva ¹ , Dr.oec.; Biruta Sloka ² , Dr.oec., professor ⁺ ; Inara Kantane ³ , Dr.sc. admin., researcher, associate professor and Anastasija Vilcina ⁴ , Dr.oec., professor | |
| | 276 |
| HOUSEHOLD PRO-ENVIRONMENTAL BEHAVIOR DEVELOPMENTS IN LATVIA: BEHAVIORAL PRACTICE AND VALUES ORIENTATION | 281 |
| Janis Brizga ¹ , Dr.geogr., Janis Ikstens ² , Dr.sc.pol.; Kristine Gaugere ¹ , MScPol.; Raimonds Ernsteins ¹ , Dr.hab.paed. | |
| | 281 |
| CREATION OF A "GREEN" PRODUCT BRAND FOR PROMOTION OF SUSTAINABLE CATERING SERVICES IN ZEMGALE REGION | 292 |
| Gunta Grinberga-Zalite ¹ , Dr.oec., assoc.professor; Alise Ozolina ² , Mg.oec..... | |
| | 292 |
| CUSTOMER RWTATIONSHIP FORMATION AND MANAGEMENT IN RETAL TRADE ENTERPRISES IN THE BALTICS COUNTRIES | 300 |
| Iveta Linina ¹ , Mg.oec. | |
| | 300 |
| THE ANALYSIS OF ECOLOGICAL CULTURE AND BEHAVIOUR OF STUDENTS AND EMPLOYEES IN RUSSIAN UNIVERSITY | 307 |
| Anastasia Lukina ¹ , PhD/ Associate Professor; Daria Malova ² , PhD and Vasily Kuznetsov ² | |
| | 307 |
| FACTORS AFFECTING CONSUMER BUYING PROCESS OF ORGANIC FOOD IN KRAKOW URBAN AREA | 314 |
| Renata Matysik-Pejas ¹ , Dr. Ing.; Monika Szafranska ² , Dr. Ing.and Elena Horska ³ , prof. Dr. Ing..... | |
| | 314 |
| SPORTS ROLE IN ECONOMICS | 322 |
| Ieva Opolska ¹ , Mg.oec.; Liga Proskina ¹ , Dr.oec. | |
| | 322 |
| CUSTOMER SATISFACTION WITH MOBILE OPERATORS' SERVICES IN LITHUANIAN RURAL AREAS | 330 |
| Lina Pileliene ¹ , PhD; Viktorija Grigaliunaite | |
| | 330 |
| REAL ESTATE DEVELOPERS' POSSIBILITIES OF INCREASING COMPETITIVENESS IN THE GLOBAL ENVIRONMENT CONDITIONS | 338 |
| Inara Repsa ¹ , MBA; Rosita Zvirgzdina ² , Dr.oec..... | |
| | 338 |
| FOOD SECURITY IN THE EUROPEAN UNION: CASE STUDY OF LAMB MARKET | 344 |
| Tomasz Rokicki ¹ , PhD..... | |
| | 344 |
| SUSTAINABLE CONSUMPTION AS A BEHAVIOUR MODEL OF HOUSEHOLDS | 351 |
| Agnieszka Siedlecka ¹ | |
| | 351 |
| EMPIRICAL METHODOLOGY OF MODERN MONOPOLISATION PROCESS ASSESSMENT: AN EXTENDED COMMENTARY | 360 |
| Dmitrijs Skoruks ¹ , Mg.oec., Maija Senfelde ² , Dr.oec..... | |
| | 360 |
| DETECTING MONOPOLISATION TENDENCIES IN THE CONTEXT OF MODERN BUSINESS CYCLES: ELABORATION VIA IMPLEMENTATION | 367 |
| Dmitrijs Skoruks ¹ , Mg.oec.; Jekaterina Nazarova ² , Mg.oec.; Maija Senfelde ³ , Dr.oec. | |
| | 367 |

INTEGRATED AND SUSTAINABLE REGIONAL DEVELOPMENT

MULTIDIMENSIONAL COMPARATIVE ANALYSIS OF SUSTAINABLE DEVELOPMENT IN EUROPEAN UNION

Bak Iwona¹, dr hab.; Cheba Katarzyna², dr

^{1, 2} West Pomeranian University of Technology Szczecin

Abstract. The main purpose of the paper is to assess the comparative level of sustainable development of European Union countries. Posing such questions is particularly important in the case of such political and economic structures as European Union. The analyses conducted in the paper allow to track changes in individual EU countries, forming a single organism, but they are characterized by differing levels of development, with different resistance to the crisis of 2007-2008 and often completely different socio-economic realities. To study the spatial differentiation of social and economic development, on the basis of sustainable development indicators presented by Eurostat, the taxonomic measure of development based on median vector Weber was used. The results obtained in this study can be used in subsequent years to examine the direction of changes in sustainable development levels observed from the point of view of the EU Member States. The results obtained in the work confirm the significant differences between the EU countries in the field of sustainable development. These differences are especially visible between the countries located in different geographical area of Europe (such as Northern and Western Europe and Southern and Eastern Europe).

Key words: sustainable development, multidimensional analysis, European Union.

JEL code: C38, O11, P36.

Introduction

The European Union with its structure, which is composed of sovereign nations, is a significant global force. This structure and the combined total of many vastly varying economies can, on the one hand, determine the power of the EU economy, while on the other - it can disturb its harmonious operation. Balanced development of the Member States of European Union is one of the strategic objectives of further EU functioning and it can and should be considered in reference to numerous areas of the EU operation, like a sustainable development (Report..., 1997).

Dynamic changes noted on the world markets, which are predominantly connected with economic slowdown, coerce the consideration of the uniformity of development of each region. A particularly interesting area of research in this field is the impact analysis of social and economic development, for example on the basis of sustainable development indicators before (2004) and after the economic slowdown in 2007-2008 (2014). The analyses of that type allow to track changes in individual EU countries, forming a single organism, but they are characterized by differing levels of development and often completely different social and economic realities. The previous study by the authors (Bak I., 2014; Cheba K., 2015) confirmed the existence of

significant heterogeneity of spatial development of individual geographical regions of the European Union. Therefore, further research will concentrate on studying the applications received on the basis of data on indicators of sustainable development, analysed separately before and after the period of economic slowdown.

The main purpose of the paper is to assess the comparative level of sustainable development of the European Union countries. Posing such questions is particularly important in the case of such political and economic structures such as the European Union. We would like to try to find also an answer to the question, whether it is possible to talk in today's globalizing world about the uniform socio-economic development? The results presented in the work will contribute to increasing knowledge about the level of sustainable development of the EU countries. To study the spatial differentiation of social and economic development the taxonomic measure of development based on median vector Weber has been used.

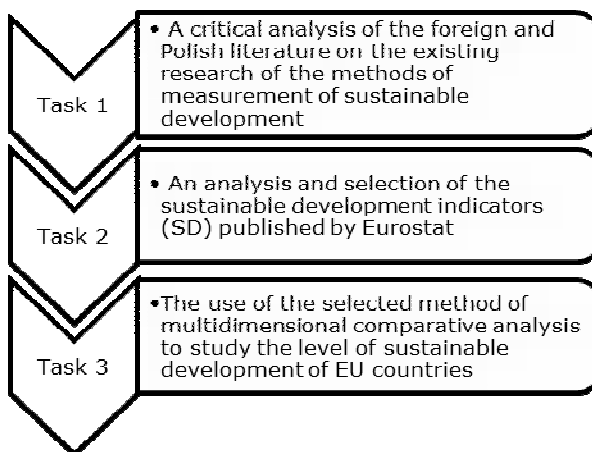
Methodology of the study

The research method in this paper consists of three tasks (Fig. 1).

In the first task, the critical analysis of the foreign and Polish literature has been analysed. On the basis of analysis of the literature, the

existing research of the method of measurement of sustainable development was analysed.

In the next task, the analysis and selection of the sustainable development indicators published by Eurostat were carried out. At the beginning of the study, a database was set up. The original database included 47 indicators describing 12 themes of European sustainable development. Due to the shortage of data about some of the indicators in 2004 and 2014, those indicators were excluded from the study.



Source: author's elaboration

Fig. 1. Research method

Then, in the last task of the study a selected method of multidimensional comparative analysis to study the level of sustainable development of the EU countries was implemented. In the work, the taxonomic measure of development based on median vector Weber and vector calculus was used.

The measurement of sustainable development in the European Union

In the literature, the problem of sustainable development is widely discussed. A sustainable development is very often presented in the context of:

- theories and economic models (Hopwood B. et al., 2005; Eagle N. et al., 2010; Bal-Domanska B. and Wilk J., 2011; Stefanescu D. and On A., , 2012; Boda et al., 2015; Duran et al., 2015, Sustainable ..., 2015).
- its relationship with ecology (Ciazela H., 2005; Borys T., 2011);
- philosophy (Borys T., 2011; Dutta U., 2016;).

An important area of this study is primarily a measurement of sustainable development comprising of identification of indicators of sustainable development (SDI) or analysis of these indicators in different areas of this field.

In the European Union, the implementation of the EU Sustainable Development Strategy (EU SDS) is monitored by means of the Sustainable Development Indicators (SDI) published by Eurostat (Sustainable..., 2015).

The SDIs have a hierarchic structure whose components are divided into three levels. At the top, there are 11 Headline Indicators that are intended to give an overall picture of the progress in terms of the key challenges of the EU SDS. The second level is represented by of 31 Operational Indicators that relate to the operational objectives of the Strategy, while at the third, lowest level there are 84 Explanatory Indicators that illustrate the progress of the actions described in the SDS.

In this work, to assess similarities and differences at the level of sustainable development of the EU Member States the sustainable development indicators published by Eurostat have been used.

Database

In total, the Eurostat database collected information about 126 indicators describing sustainable development (Table 1).

However, not all of them are available at the individual level of the EU Member States (e.g. in the case of indicators describing the area of natural resources), both in 2004 and 2014. These restrictions meant that the original set of 126 characteristics was reduced to 74 indicators representing different areas of sustainable development, which were the final selection taking into account the statistical criteria. The selection criteria were divided into two groups: the content related and formal/statistical ones. In the first approach, the set of diagnostic characteristics contains such values that, according to the obtained knowledge about the

phenomena under study, are the most typical of the compared objects. In the second approach, the selection of characteristics follows a specific formal procedure.

Table 1

| Title | | |
|-------|--|--|
| No | SD theme | Numbers of operational indicators/ explanatory/ contextual |
| 1. | Socio-economic development | 5/11/- |
| 2. | Sustainable consumption and production | 3/14/2 |
| 3. | Social inclusion | 5/12/1 |
| 4. | Demographic changes | 4/3/5 |
| 5. | Public health | 2/7/- |
| 6. | Climate change and energy | 3/7/- |
| 7. | Sustainable transport | 4/6/1 |
| 8. | Natural resources | 4/5/- |
| 9. | Global partnership | 3/9/1 |
| 10. | Good governance | 3/3/1 |

Source: author's elaboration based on Eurostat

First, the assessment analysed the coefficients of variation calculated for each variable, taking as a criterion for the resignation of the given feature the coefficient of variation less than or equal to 10 % and in the evaluation of the correlation of variables a parametric method of selection of Hellwig features was used (Hellwig Z., 1981), taking the critical value of the correlation coefficient equal to 0.5 or higher. In this way, the original set of features was reduced to 22 indicators (where: S – stimulants and D – destimulants), (Table 2).

A research tool applied

In the work to study the spatial differentiation of sustainable development of individual countries in the European Union, the taxonomic measure of development based on median vector Weber (Weber A., 1971) was used. The median Weber is a multi-dimensional generalization of the classical notion of the median. It is about vector that minimizes the sum of Euclidean distance (Euclidean distance) of the data points representing the considered objects, and therefore is somehow "in the middle" of them,

but it is also immune to the presence of outliers (Mlodak A., 2006). The positional option of the linear object assignment takes a different standardization formula, compared to the classical approach, based on a quotient of the feature value deviation from the proper coordinate of the Weber median and a weighed absolute median deviation, using the Weber median (Weber A., 1971).

$$z_{ij} = \frac{x_{ij} - \theta_{0j}}{1,4826 \cdot \tilde{m}ad(X_j)} \quad (1)$$

Where:

$\theta_0 = (\theta_{01}, \theta_{02}, \dots, \theta_{0m})$ is the Weber median;

$\tilde{m}ad(X_j)$ is the absolute median deviation, in

which the distance from the features to the Weber vector is measured, i.e.:

$$\tilde{m}ad(X_j) = \text{med}_{i=1,2,\dots,n} |x_{ij} - \theta_{0j}| \quad (j = 1, 2, \dots, m).$$

The aggregate measure is calculated with the formula:

$$\mu_i = 1 - \frac{d_i}{d_-} \quad (2)$$

Where:

$d_- = \text{med}(\mathbf{d}) + 2,5\text{mad}(\mathbf{d})$, where $d = (d_1, d_2, \dots, d_n)$ is a distance vector calculated with the

formula: $d_i = \text{med}_{j=1,2,\dots,m} |z_{ij} - \phi_j|$ $i = 1, 2, \dots, n$,

$\phi_j = \max_{i=1,2,\dots,n} z_{ij}$ - the coordinated of the

development pattern vector, which is constituted of the maximum values of the normalized features.

The assignment of objects with a positioning measure is the basis for a division of objects into four classes. The most commonly used grouping method in the positioning scope is called the *three medians method*. It involves indicating a median of vector coordinates $\mu = (\mu_1, \mu_2, \dots, \mu_n)$, which is denoted $\text{med}(\mu)$, then dividing the population of objects into two groups: those, for which the measure values exceed the median and are higher than it. Next the indirect medians

are defined as: $\text{med}_k(\mu) = \text{med}_{i: \Gamma_i \in \Omega_k}(\mu_i)$, where $k = 1, 2$. This way the following groups of objects are created:

- Group I: $\mu_i > \text{med}_1(\mu)$,

- Group II: $\text{med}(\mu) < \mu_i \leq \text{med}_1(\mu)$,
- Group III: $\text{med}_2(\mu) < \mu_i \leq \text{med}(\mu)$,
- Group IV: $\mu_i \leq \text{med}_2(\mu)$.

Table 2

Final database

| No | SD area | Feature |
|----|--|--|
| 1. | Socio-economic development | <ul style="list-style-type: none"> – young people neither in employment nor in education or training (NEET) (15-24 years), % of the total population in the same age group - (x_1, D); – total R&D expenditure, % of GDP - (x_2, S); – total unemployment rate, % - (x_3, D); |
| 2. | Sustainable consumption and production | <ul style="list-style-type: none"> – generation of waste excluding major mineral wastes, kg per capita - (x_4, D); – final energy consumption, 1000 tonnes of oil equivalent - (x_5, D); |
| 3. | Social inclusion | <ul style="list-style-type: none"> – early leavers from education and training, % - (x_6, D); – tertiary educational attainment, by sex, age group 30-34, % - (x_7, D); – long-term unemployment rate - (x_8, D); – lifelong learning, % - (x_9, S); |
| 4. | Demographic changes | <ul style="list-style-type: none"> – employment rate of older workers, % - (x_{10}, S); – total fertility rate, number of children per woman- (x_{11}, S); – old-age dependency ratio, per 1000 persons - (x_{12}, D); |
| 5. | Public health | <ul style="list-style-type: none"> – life expectancy at birth of males, years - (x_{13}, S); |
| 6. | Climate change and energy | <ul style="list-style-type: none"> – primary energy consumption, million TOE (tonnes of oil equivalent) - (x_{14}, S); – share of renewables in gross final energy consumption, % - (x_{15}, S); – electricity generated from renewable sources, % - (x_{16}, S); – share of renewable energy in fuel consumption of transport, % - (x_{17}, S); |
| 7. | Sustainable transport | <ul style="list-style-type: none"> – consumption of transport relative to GDP, index (2010=100 %) - (x_{18}, D); – energy consumption by transport mode – road transport, 1000 tonnes of oil equivalent - (x_{19}, D); |
| 8. | Global partnership | <ul style="list-style-type: none"> – CO2 emissions per inhabitant in the EU and in developing countries, tonnes - (x_{20}, D); |
| 9. | Good governance | <ul style="list-style-type: none"> – shares of environmental taxes in total tax revenues from taxes and social contributions, % - (x_{21}, D); – level of citizens' confidence in EU institutions (for sub-theme policy coherence and effectiveness), % - (x_{22}, S). |

Source: author's elaboration based on Eurostat data

The Weber median was calculated in R program: *l1median* of package *pcaPP*.

Research results and discussion

Table 3 shows the mean values of some Headline Indicators of the EU sustainable development as well as the measures of its diversification in 2004 and 2014. The indicators were selected due to their availability in all the years of this analysis. The choice of those years was not a random one. In 2004, the EU was joined by East European countries, this period shows the situation before the world financial and economic crisis of 2007/2008. While 2014 was

the last year when the majority of the analysed indicators were available in the Eurostat database.

The results presented in the table show that in a longer time frame, progress was observed in such themes as sustainable consumption and production, demographic changes and, partially, in climate change and energy (greenhouse gas emissions indicator). Significant diversification of indicators was observed in relation to the environmental aspects of the EU development. While, the improvement was recorded in the case of indicators dependent on the economic cycle

(being in downturn due to the economic crisis), such as greenhouse gas emissions and energy consumption. Particularly positive trends were seen in the greenhouse gas emissions whose 2012 indicator was lower only by 2 percentage points than the limit of 20 % reduction below the 1990 levels assumed in the Europe 2020 Strategy. Downward trends were observed in the social inclusion and natural resources themes.

Table 3

The descriptive statistics of SD indicators of the EU in 2004 and 2014

| No | Variable | Descriptive statistics | 2004 | 2014 |
|----|-----------------|------------------------|-----------------|-----------------|
| 1. | x ₁ | \bar{x} Vs | 20 000 68.59 | 25 925 65.74 |
| 2. | x ₂ | \bar{x} Vs | 1.25 60.67 | 1.65 60.33 |
| 3. | x ₄ | \bar{x} Vs | 40.87 27.27 | 51.29 19.78 |
| 4. | x ₇ | \bar{x} Vs | 19.12 8.38 | 20.92 7.42 |
| 5. | x ₈ | \bar{x} Vs | 15.45 10.60 | 17.29 10.71 |
| 6. | x ₉ | \bar{x} Vs | 97.97 31.18 | 81.38 32.76 |
| 7. | x ₁₀ | \bar{x} Vs | 61.03 134.99 | 53.83 135.41 |
| 8. | x ₁₁ | \bar{x} Vs | 104.68 7.55 | 100.93 5.11 |

Source: author's calculations based on Eurostat data, where: x – average and Vs – coefficient of variation in %

Next table (Table 4) shows the results of the classification and the typological groups of the EU countries obtained by means of the taxonomic measure of development calculated on the basis of the characteristics of their socioeconomic situation.

It is clear that the positions of individual countries in the obtained rankings were usually different, with the exception of Sweden and Denmark whose positions (the first and the second, respectively) did not change in the years of study. Finland and Italy did not move further than by one or two positions.

The greatest leaps were observed in the case of Slovakia, which was last in the 2004 ranking, and the 7th in 2014. Four EU countries did not see any fall in the ranking in 2004 and 2014, while 10 countries picked up in the ranking (the largest increase in Slovakia from 27th to 7th position).

The socioeconomic situation in 2014 compared to 2004 deteriorated in 14 countries – the most affected were Greece (down from the 17th to the 28th position), the Czech Republic (the fall from the 10th to the 20th position). Hungary and Ireland went down by nine positions.

Table 4

The EU countries sorted by the social and economic development in 2004 and 2014

| No | Country (value of mater - Error! Objects cannot be created from editing field codes.) | Group | Country (value of mater - Error! Objects cannot be created from editing field codes.) | Group |
|----|--|-------|--|-------|
| | 2004 | | 2014 | |
| 1. | Sweden (0.689), Denmark (0.604), Ireland (0.551), Finland (0.526), Luxembourg (0.428), Slovenia (0.397), Austria (0.350) | I | Sweden (0.820), Denmark (0.688), Lithuania (0.633), Luxembourg (0.623), Finland (0.608), Latvia (0.557), Slovakia (0.512) | I |
| 2. | Hungary (0.348), France (0.341), Czech Republic (0.322), Latvia (0.300), Lithuania (0.294), Estonia (0.294), Cyprus (0.289) | II | Austria (0.478), Slovenia (0.469), France (0.465), United Kingdom (0.445), Ireland (0.410), Poland (0.397), Estonia (0.371) | II |
| 3. | Portugal (0.285), Belgium (0.250), Greece (0.221), United Kingdom (0.216), Netherlands (0.215), Germany (0.202), Malta (0.181) | III | Germany (0.339), Belgium (0.334), Hungary (0.325), Netherlands (0.312), Portugal (0.309), Czech Republic (0.306), Cyprus (0.281) | III |
| 4. | Romania (0.177), Spain (0.125), Croatia (0.108), Italy (0.077), Bulgaria (0.046), Slovakia (0.013), Poland (-0.076) | IV | Romania (0.266), Croatia (0.219), Bulgaria (0.183), Malta (0.105), Italy (0.074), Spain (0.067), Greece (0.026) | IV |

Source: author's calculations based on Eurostat data

The worst situation was observed in the case of countries located in Southern Europe. Most of

them received worse position in 2014 than in 2004. In the next table (Table 5), the comparison

of the situation in a geographical region of Europe in 2004 and 2014 was presented.

Table 5

The EU countries sorted by the social and economic development in 2004 and 2014

| No | Region | Average position in the ranking | |
|----|-----------------|---------------------------------|------|
| | | 2004 | 2014 |
| 1. | Northern Europe | 8 | 7 |
| 2. | Western Europe | 13 | 12 |
| 3. | Southern Europe | 18 | 22 |
| 4. | Eastern Europe | 20 | 18 |

Source: author's calculations based on Eurostat data

Many authors (Framing..., 2007; Klenert D. et al., 2015; Nic M. and Swieboda P., 2014; Peacock W. G., 1998) indicate that the division of the European Union into 'better' West European countries and 'worse' Eastern Europe, is still synonymous to the differences in the EU development. The results presented in this work show a completely different situation in Europe. According to the results presented, these are so called the new member states located in Eastern Europe that took much higher positions in the compiled ranking than much more developed countries of Southern Europe.

It arises a question: Did the countries of Southern Europe cope so badly with the economic crisis, or whether these changes are associated with a higher resistance to the crisis of countries of Eastern Europe? An answer lies somewhere in the middle. It must be first remembered that in Table 5, there is only information showing what an average position occupies countries located in different geographical regions of Europe. To this average position, e.g. In the case of Eastern European countries in 2014 contributed relatively high positions in Slovakia (group I, 7th place in the ranking) and Poland (group II, 13th place in the ranking) and very low positions of such countries as Bulgaria and Romania (both assigned to the last group with the lowest results). However, in the case of South European countries the relatively high position of Slovenia is observed

(group II, 9 position in the ranking) and three lowest places in the created ranking occupied by countries such as Italy, Spain and Greece.

A detailed analysis of positions taken by individual EU countries within the ranking confirms that a significant improvement can be observed especially in the case of countries located in Eastern Europe.

It may be considered whether such a division of Europe into geographical regions describes well the situation of individual EU member states. It should be remembered, however, that the region is e.g. the first indicator considered when choosing the location of the investment (Dunning, 2003, 2004, 2006). In the literature there are many studies showing a region in the context of resistance to a crisis, economic development or development of industrial potential and many others (ex. Stefanescu, 2012). It is one of the most obvious divisions used to describe the socio-economic situation in Europe and in the European Union (in the work considered in the context of sustainable development).

Conclusions

- 1) The aim of the study results presented in this work was a comparative analysis of changes in the area of sustainable development of the EU before the crisis of 2007-2008 and afterwards.
- 2) Currently, the worst situation in the field of sustainable development may be found in the countries located in the Southern Europe.
- 3) Today, the situation in the field of sustainable development in the countries located in Eastern Europe is much better than in the countries located in Southern Europe.
- 4) The map of divided Europe changed a little after the economic and financial crisis when had turned out that those were the EU countries in the south that suffered most of all.
- 5) The above observations have been confirmed by the results of the studies and analyses

presented in this paper. The change of the situation on the level of sustainable development of the EU countries is particularly present in the South European countries. However, the situation has improved in Eastern Europe. Moreover, the West and North European countries have strengthened

their position in the rankings measuring the rate of their sustainable development.

6) The results obtained in this study can be used in subsequent years to examine the direction of changes in sustainable development levels observed both from the point of view of the EU Member States and geographical regions.

Bibliography

- Bal-Domanska, B., Wilk, J., (2011). Gospodarcze Aspekty Zrownowazonego Rozwoju Wojewodztwa – Wielowymiarowa Analiza Porownawcza (Economic Aspects of Sustainable Development of the Region - Multidimensional Comparative Analysis), *Przeglad Statystyczny* 58, z.3-4, pp. 25-34.
- Bak, I., (2014). Influence of Feature Selection Methods on Classification Sensitivity Based on the Example of a Study of Polish Voivodship Tourist Attractiveness, *Folia Oeconomica Stetinensia*, 13/2, pp. 134-145.
- Boda, F., Munteanu, L., Raducanu, D., (2015). Digital elevation Modelling Based on Multimodal Aerospace Data in the Context of Sustainable Development of Romania, *Procedia Economics and Finance*, vol. 32, pp. 45-56.
- Borys, T., (2002). Wskazniki Rozwoju Zrownowazonego. Podstawowe Kierunki Badan i Zastosowan (The Indicators for sustainable development. The basic directions of research and applications), *Ekonomia i Srodowisko* 1 (21), pp.35-48.
- Borys, T., (2011). Zrownowazony Rozwoj – Jak Rozpoznać Ład Zintegrowany (Sustainable Development – How to Recognize the Integrated Order), *Problemy Ekorozwoju: Studia Filozoficzno-socjologiczne*, vol. 6, no 2, pp-45-67.
- Ciazela, H., (2005). Edukacja Wobec Etycznego Wymiaru Idei Rozwoju Trwałego i Zrownowazonego (Education Versus the Ethical Dimension of Ideas for Sustainable Development), *Prakseologia*, nr 145, pp. 33-41.
- Cheba, K., (2017). The Applications of Vector Calculus to the Study of the Uniformity of Development of Socio-economic Objects, *MSA2016*, Lodz.
- Dunning, J.H., (2003). The Role of Foreign Direct Investment in Upgrading China's Competitiveness. *Journal of International Business and Economy*, Vol. 4, No. 1, pp43-58.
- Dunning, J.H., (2004). *Determinants of Foreign Direct Investment: Globalization-Induced Changes and the Role of Policies*. World Bank: Washington, pp.64-85.
- Dunning, J.H., (2006). Towards a New Paradigm of Development: Implications for the Determinants of International Business. *Transnational Corporation*, Vol. 15, No. 1, pp. 23-38.
- Duran, D.C., Gogan, L.M., Artene, A., Duran, V., (2015). The Components of Sustainable Development – a Possible Approach, *Procedia Economics and Finance*, 26, pp. 812-817.
- Dutta, U., (2016). Prioritizing the Local in an Era of Globalization: A Proposal for Decentering Community Psychology, *American Journal of Community Psychology*.
- Eagle, N., Macy, M., Claxton, R., (2010). Network Diversity and Economic Development, *Science* 21, 328/5981, pp. 1029-1031.
- Framing Sustainable Development, The Brundtland Report – 20 Years On, Sustainable Development in Action* (2007). United Action Commission on Sustainable Development, Background.
- Hellwig, Z., (1981). *Wielowymiarowa Analiza Porownawcza i Jej Zastosowanie w Badaniach Wielocechowych obiektow gospodarczych* (Multidimensional Comparative Analysis and Its Application in Research Multivariate Economic Facilities), PWE, Warszawa.
- Hopwood, B., Mellor, M., O'Brien, G., (2005). *Sustainable Development*, Wiley Online Library.
- Klenert, D., Mattauach, L., Edenhofer, O., Lessmann, K., (2015). Infrastructure and Inequality: Insights from Incorporating Key Economic Facts about Household Heterogeneity, *Macroeconomic Dynamics*, available on CJO2016. doi:10.1017/S1365100516000432.
- Młodak, A., (2006). *Analiza Taksonomiczna w Statystyce Regionalnej*, (Taxonomic Analysis in Regional Statistic), Diffin, Warszawa.
- Nic, M., Swieboda, P., (2014). *Central Europe Fit for the Future: 10 years after EU Accession*, Central Europe Studies.
- Peacock, W. G., Hoover, G. A., Kilian, C. D., (1988). Divergence and Convergence in International Development: A Decomposition Analysis of Inequality in the World System, *American Sociological Review*, 6, pp.838-852.
- Report of the World Commission on Environment and Development*, (1997), Our Common Future. Un Documents: Gathering a Body of Global Agreements has been compiled by the NGO Committee on Education of the Conference of NGOs from United Nations web sites with the invaluable help of information & communications technology, United Nations.
- Stefanescu, D., On A., (2012). Entrepreneurship and Sustainable Development in European Countries before and During the International Crisis, *Procedia - Social and Behavioral Sciences*, 58, pp. 889-898.
- Sustainable Development in the European Union 2015 Monitoring Report of the EU Sustainable Development Strategy*, (2015), Eurostat.
- Weber, A., (1909, reprint 1971), *Theory of Location of Industries*, Ed. By Russel & Russel, New York.

PROBLEMS OF PRICING AS A COMPETITIVENESS TOOL IN LATVIAN BUSINESS ENVIRONMENT

Ieva Bruksle¹, Mg.oec; Rosita Zvirgzdina², Dr. oec.

Abstract. Entrepreneurs work today in a changing environment and under circumstances of fierce competition. Price is deemed to be a tool that entrepreneurs could use for strengthening their position and their competitiveness. However, price and pricing is a complex process and often undeservedly little used as a competitiveness enhancement tool. The aim of this study is to evaluate the problems concerning pricing in the Latvian business environment. To achieve the aims, the role of the pricing process and the factors influencing it have been described, a comparison of the competitiveness of the Latvian business environment with other countries has been carried out and actual problems related to pricing in the Latvian business environment have been identified based on the opinions of entrepreneurs and experts. Research methodology used in the research: logically constructive approach; synthesis method; social research methods – panel discussion and interviews. As a result, the problems concerning pricing in the Latvian business environment will be evaluated.

Key words: pricing, pricing problems, Latvian business environment, competitiveness.

JEL code: M21, O31, R1

Introduction

Entrepreneurs work today in a changing environment and it is essential to be competitive; price is one of the factors promoting competitiveness.

The research aims to evaluate problems concerning pricing in the Latvian business environment.

The following tasks were set to achieve the aims:

- 1) describe pricing as an essential factor enhancing competitiveness;
- 2) carry out a comparison of Latvian business environment to other countries and analyse the specifics of pricing in the Latvian business environment;
- 3) evaluate pricing related problems in the Latvian business environment.

The research enables us to analyse pricing related problems in the Latvian business environment from an alternative point of view.

The following research methodology has been used in the research: logically constructive approach, synthesis method, social research methods, panel discussion and interviews that enable us to gain a clear insight of the situation, identify the positive and negative aspects of pricing in the Latvian business environment based on the information gathered.

A panel discussion was organised to gain qualitative information on the specifics and problems related to pricing in the Latvian business environment. 11 entrepreneurs with huge experience in the Latvian market participated in the panel discussion. The panel discussion questions were formulated to ascertain the entrepreneurs' view of factors enhancing competitiveness, specifics of pricing, pricing related problems in the Latvian business environment and possible solutions that would enable using price as a comprehensive tool for enhancing competitiveness.

Expert interviews were organised to gather additional information and expert opinion on pricing as a competitiveness enhancing tool and problems that hinder pricing in the Latvian business environment. Specialists from various sectors, economists and members of associations of effective direct marketing, management and accountants were interviewed. Experts had to submit their evaluation.

Research results and discussion Competitiveness and price

Opinions on price as an important competitiveness enhancing tool have been reviewed in this section of the research. At first, we would like to focus a bit on competitiveness and its factors to describe the role of price in building competitiveness. Competitiveness and its

¹ Ieva Bruksle Tel.: +371 29404321. E-mail address: ievab@turiba.lv

² Rosita Zvirgzdina Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

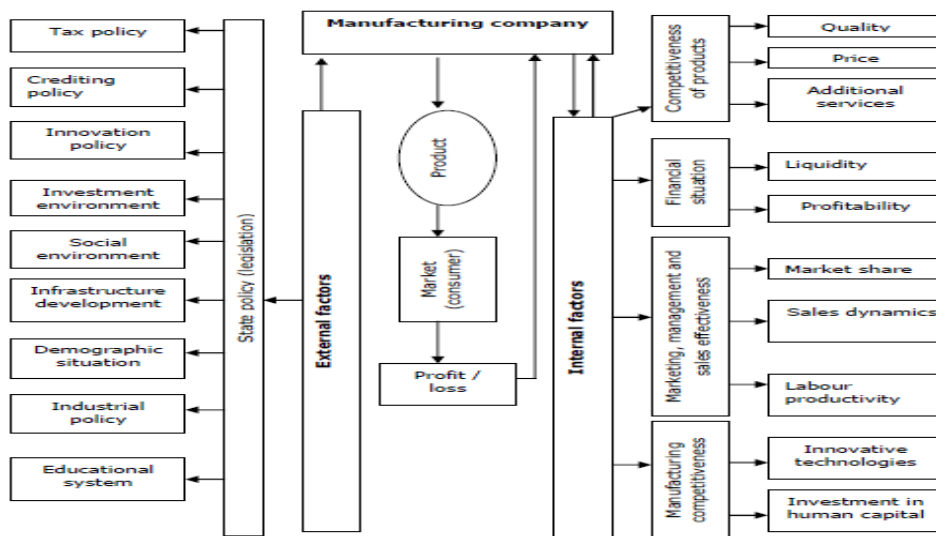
factors have been widely researched and analysed in literature, and we will offer some opinions.

Competitiveness in economics and business is the ability of enterprises, sector or the state to sell products, goods or services in the market. Competitiveness is the ability to compete with analogical objects (goods or services) in a particular market using a competitive advantage (price, quality etc.) to achieve its aims (Hirschey, 2008).

Competitive advantage of enterprises arises and exists in direct relation to the internal environment in the country – the business and investment environment. The success of enterprises in relation to its competitors is dependent on the situation in the country or region and in turn the country develops in a global competitive environment. Therefore, there is a kind of cycle – a nation’s economic growth results are dependent on the performance of its

enterprises but the competitiveness of companies is influenced by the nation’s economic development level (Denisovs, 2008).

Characterising factors that influence the competitiveness of enterprises they can be divided into internal and external factors; external factors seriously influence the formation of a competitive business environment. Vasileva and Glebova (Vasileva, Glebova, 2010) have developed a model (Fig. 1.), that clearly demonstrates the interaction of the internal and external environment and their influence on the competitiveness of the enterprise. The model shows that enterprises to a large extent are dependent on external factors such as taxation policies, loans, innovation policy, social environment, infrastructure development level, demographic situation in the country, industrial policy priorities, education system and the quality of all these factors is influenced by state policy and legislation.



Source: designed by the author based on Vasiljeva, Glebova, 2010

Fig. 1. Model of provision of competitiveness of manufacturing enterprises

We would like to underline the opinions expressed in the previous research that, in essence, the impact of each external factor on the business environment and the enterprise that exists in the environment is huge and the impact of their interaction is even greater. These factors have one common feature. The form the environment where the enterprise exists influences it but the enterprise cannot influence

these external factors. The enterprise is responsible for its internal environment, which it forms on its own. The enterprise feels the impact of internal and external factors on its operations and makes a profit or loss from the sales of its products or services depending upon its level of competitiveness. So, the competitiveness of enterprises is formed by the interaction of

¹ Ieva Bruksle Tel.: +371 29404321. E-mail address: ievab@turiba.lv
² Rosita Zvirgzdija Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

internal and external factors (Bruksle, Abeltina, Zarina, 2016).

We would like to emphasise that price and pricing is a significant internal environment factor. Moreover, it is one of the most flexible factors and tools that the enterprise could actively use to enhance the competitiveness of its products.

Kotler, Wong., Saunder, Armstrong deem that an enterprise could gain a competitive edge by offering consumers higher value or a lower price in comparison to their competitors' price or by offering consumers a bigger benefit that compensates the higher product and service prices (Kotler et al., 2005). Consequently, price and pricing play a significant role as it together with the offered benefit - product or service can ensure a competitive advantage.

The authors consider that price is one of the most significant tools that is accessible to enterprises and well considered pricing would enable it to operate successfully in the modern changing and complex business environment. Let's further focus a bit more on pricing and the importance of this process in enterprise operations by providing a review of the opinions of various authors.

Pricing is the moment of truth; indeed, it is the moment of truth for everything a company does. New technologies and globalization are changing the marketplace at a much faster pace than before and blurring the boundaries of many industries. Competition continues to grow in just about every industry, and the focus of that competition has been predominantly on price. Consumers have much more pricing information and are more sophisticated on how they use it. Perhaps it's the sense of helplessness that prevents more companies from treating their pricing more seriously. How can you bargain with a customer who knows your cost structure? Getting the pricing right is, in the end, both art and science. Like most business practices, the best pricing decision is grounded not only in

theory, but experience and instinct (Raju, Zhang, 2010).

There is a fundamental "profit disconnect" in business today. Companies work to bring a product to the market by investing significant effort and money in research and development, distribution and marketing strategies. However, when it comes to setting a price - how businesses get compensated for their hard work and financial risk - most companies drop the ball. Most companies don't realize the direct link between prices and their profits. It's this connection that makes pricing one of the most powerful strategies available to businesses today. Better pricing is powerful and easy to implement, quickly produces results, and focuses a company on creation and creating a new value (Mohamed, 2010).

Qualitative pricing has been highlighted as a relatively less used powerful tool accessible to managers in circumstances of cost cutting and dwindling demand in many markets. The real significance of pricing is ever more increasing (Marn, Regner, Zavada, 2004).

Pricing decisions must be made within the context of ever - changing circumstances. The severe economic downturns is t one of them - commoditization, discounting, price wars, competition, government pressures, and a host of other dangers are always present (Macdivitt, Wilkinson, 2012).

The following three maxims of the 'price' should always be borne in mind: price is the most prevalent shorthand way by which customers assess a good or service; pricing exactly to the competitor, will 'commoditize' your product; it is important to understand your own product and its value versus your competition (Ruskin-Brown, 2008).

Price is the most powerful marketing tool. To have a real impact on your profitability, you swing the sledgehammer called pricing. Even though it's the most powerful, it's also the least understood. Every pricing situation is unique. A

¹ Ieva Bruksle Tel.: +371 29404321. E-mail address: ievab@turiba.lv

² Rosita Zvirgzdija Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

price is just a number. Setting a price is an event in time. Optimal pricing is an on-going journey (Stiving, 2011).

Gaining a price advantage an enterprise can increase its competitiveness thanks to competent pricing. The decision to gain a price advantage is directly linked to implementing changes that could affect all spheres of an enterprise's operations. Any enterprise can introduce an appropriate pricing system based on critical evaluation of the preconditions: coordination of the entire organisation's operations, planning its future, developing its own pricing policy, relying on its information system infrastructure, periodically reviewing the price structure and carrying out the necessary improvements in price decisions. The pricing system should be transparent, continuous evaluation of the system should be carried out and a correction mechanism must be worked out. A transparent pricing process can be obtained by developing a systematic and transparent approach. The pricing system is essential for any business and demands huge investments, sometimes financial but always investment of time and knowledge (Bruksle, Gode, 2012).

While price is generally a competitive tool for increasing demand for a firm (and often a tool for stimulating industry demand), risk-averse policies generally do not explicitly consider competitive response and consumer demand as significant inputs to the pricing decision. This appears to result from the knowledge that similar pressures (such as the rising cost of materials) also usually plague competitors, from the expectation that competitors will adopt (or have adopted) similar policies (especially on discounts or escalators), or from limitations in the comparability of products and services among competitors (Guiltinan, 1976).

Consequently, we could conclude that the essential role of price in enterprise operations has been emphasised; however, pricing is a complex process that is influenced by various

internal and external environment factors. Prices appropriate for specific situations will provide the enterprise a competitive edge in especially intense competitive circumstances.

To examine optimal pricing, information is required on fixed and variable costs, as well as competitive conditions. The evaluation of optimal pricing requires an analysis of market competitiveness, cost functions, and prices. Needless to say, more research is needed in the field of pricing strategies to achieve a better understanding of optimal pricing behaviour (Enz, Canina, Lomanno, 2009).

We support that need for in depth research to understand and set prices that could be used as a competitiveness enhancing tool. Therefore, the authors will further evaluate the Latvian business environment in comparison with other countries, describe the specifics of pricing in Latvian enterprises by analysing the problems concerning pricing.

Price and competitiveness - Latvia and other countries

We will carry out a comparison of various indicators of the following countries to characterise Latvia in comparison with other countries: Estonia, Lithuania (neighbouring countries, significant trade partners and competitors in export markets), Poland (trade partner, competitor, nation with huge industrial potential and diverse production), Finland, Sweden (significant trade partners, large economies with developed production), Ireland (territorially equivalent economy, that has demonstrated the ability to develop quickly, target country for emigration of Latvian work force). The OECD and World Economic Forum research and indicators gathered have been used to carry out the comparison.

The comparison of Latvia with the abovementioned countries has been carried out (Table 1).

¹ Ieva Bruksle Tel.: +371 29404321. E-mail address: ievab@turiba.lv

² Rosita Zvirgzdija Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

Table 1

Indicators of competitiveness

| Indicator | Indicator of competitiveness based on relative unit consumer price (indices, 2010=100) | | | | Indicator of competitiveness based on relative unit labour costs (indices, 2010=100) | | | |
|-----------|--|-------|-------|-------|--|-------|---------|-------|
| | 2011 | 2014 | 2016 | 2017 | 2011 | 2014 | 2016 | 2017 |
| Country | 2011 | 2014 | 2016 | 2017 | 2011 | 2014 | 2016 | 2017 |
| Estonia | 101.2 | 104.8 | 105.6 | 104.8 | 96.4 | 100.5 | 112.8.0 | 111.7 |
| Ireland | 100.2 | 96.8 | 91.4 | 90.9 | 99.5 | 93.0 | 74.2 | 74.2 |
| Latvia | 100.6 | 101.5 | 105.3 | 103.1 | 94.3 | 103.6 | 116.5 | 113.3 |
| Lithuania | 100.7 | 101.8 | 102.6 | 101.4 | 98.1 | 100.5 | 108.9 | 108.0 |
| Poland | 98.2 | 97.0 | 90.6 | 90.1 | 96.0 | 94.1 | 89.8 | 90.3 |
| Finland | 99.6 | 101.4 | 100.5 | 99.0 | 98.7 | 101.1 | 101.1 | 98.5 |
| Sweden | 105.8 | 101.3 | 95.7 | 91.4 | 106.8 | 108.3 | 103.3 | 98.1 |

Source: designed by the author according to OECD, 2016

Evaluating the OECD competitiveness indicators, it should be concluded that the Latvian economy has a relatively higher consumer price increase (decrease in Ireland, Poland, Finland, Sweden), lagging behind only Estonia, as well as unit labour cost increase which compared to the other countries is the highest. These indicators provide an insight of

possible cost changes and provide the opportunity to make conclusions regarding the situation in the country by using the Global Competitiveness Index (gathered by the World Economic Forum) to evaluate competitiveness.

The state competitiveness changes in accordance with Global Competitiveness Index are illustrated in Table 2.

Table 2

Global Competitiveness Index (GCI)

| Country | 2012-2013* | Score ** | 2013-2014* | Score ** | 2014-2015* | Score ** | 2015-2016* | Score ** | 2016-2017* | Score ** |
|-----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|
| Estonia | 34 | 4.6 | 32 | 4.7 | 29 | 4.7 | 30 | 4.74 | 30 | 4.78 |
| Ireland | 27 | 4.9 | 28 | 4.9 | 25 | 5.0 | 24 | 5.11 | 23 | 5.18 |
| Latvia | 55 | 4.3 | 52 | 4.4 | 42 | 4.5 | 44 | 4.45 | 49 | 4.45 |
| Lithuania | 45 | 4.4 | 48 | 4.4 | 41 | 4.5 | 36 | 4.55 | 35 | 4.60 |
| Poland | 41 | 4.5 | 42 | 4.5 | 43 | 4.5 | 41 | 4.49 | 36 | 4.56 |
| Finland | 3 | 5.5 | 3 | 5.5 | 4 | 5.5 | 8 | 5.45 | 10 | 5.44 |
| Sweden | 4 | 5.5 | 6 | 5.5 | 10 | 5.4 | 9 | 5.43 | 6 | 5.53 |

* Rank –rank out of 148 (2013–2014), 144 (2014–2015), 144 (2015–2016), 138 (2016–2017) economies, the higher the better position. ** Score - scale ranges 1to 7

Source: designed by the author in accordance with Global Competitiveness Report, 2016

In accordance with the results summarised in Table 2, it can be seen that Latvia’s ranking is the lowest, just lagging behind Poland and Lithuania. Moreover, positive dynamics can be observed; however, this trend has changed in a new assessment.

However, we would like to point out that although the GCI ranking of Latvia is the lowest among the seven countries compared, Latvia’s competitiveness ranking is positively acknowledged in other areas (the index is based on 12 pillars comprising various indicators) with the macroeconomic environment rating only

lagging behind Estonia and Sweden, labour market effectiveness rating the fourth highest and Poland has lower ratings in five categories. Latvia must acknowledge with regret that Latvia is far behind in such a significant sphere such as business sophistication (11th pillar), where Latvia is ranked 58 (Estonia 44, Lithuania 42, Ireland 16, Finland 12, Sweden 6) (Global Competitiveness Report, 2016).

We would also like to point out to significant problems underlined by enterprise managers that hinder business operations prominent among which are Tax rates, Inefficient government

¹ Ieva Bruksle Tel.: +371 29404321. E-mail address: ievab@turiba.lv

² Rosita Zvirgzdija Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

bureaucracy, Tax regulations, Access to financing, Policy instability, Corruption, the same problems as emphasised by Lithuanian and Estonian enterprise managers (Global Competitiveness Report, 2016).

In addition, it was ascertained in the previous research that the competitiveness of the Latvian business environment in comparison to other countries unfortunately does not seem very convincing and often the Estonian and Lithuanian business environments are rated more positively. Although improvements can be observed, the competitiveness of the Latvian business environment is considered problematic which leads to the necessity for entrepreneurs to be able to continuously adapt to changing conditions. The following aspects can be mentioned as concerns for the Latvian business environment: lack of motivated, willing to work employees, inadequate understanding of one's values in terms of performance; changing legislation, public experiments in business - the adoption of rules and laws, which generally do not meet the small business interests and requires huge investment to implement, laws are passed without understanding the real situation; unstable tax policy, which prevents development

planning; lack of financing; low level of innovation and manufacture of low value-added products. Moreover, the Latvian market is too small to develop a considerable business and if you're a small producer, you cannot compete with large companies. However, an important aspect mentioned by the operators that should be noted is that the development of any process is hindered by human behaviour, problems caused by the same dishonest businessperson, entrepreneurs with low moral principles against which the common economic operator is unable to fight. An entrepreneur who pays taxes cannot compete with the unscrupulous, and the unstable state tax policy promotes such behaviour. Therefore, in the experts' opinion the Latvian business environment is evaluated as a changing, unpredictable and unstimulating business environment (Bruksle, Abeltina, Zarina, 2016).

Concluding the section, we would like to provide a short insight of tourism, which is Latvia's significant export product and the competitiveness rating of the commercial environment in the sphere of travel and tourism are shown in the Table 3 (Travel & Tourism Competitiveness Report 2015).

Table 3

Travel & Tourism Competitiveness Index (T&T) *

| Country | T&T 2017 | Value ** | Business Environment (Value) | Price Competitiveness (Value) | Tickets taxes, airport charge* | Hotel price index* | Purchasing power parity* | Fuel price level* |
|-----------|----------|----------|------------------------------|-------------------------------|--------------------------------|--------------------|--------------------------|-------------------|
| Estonia | 38 | (4.22) | 26 (5.13) | 72 (4.6) | 18 | 23 | 105 | 104 |
| Ireland | 19 | (4.53) | 14 (5.37) | 122 (3.7) | 78 | 46 | 124 | 128 |
| Latvia | 53 | (4.01) | 53 (4.59) | 58 (4.8) | 6 | 10 | 96 | 109 |
| Lithuania | 59 | (3.88) | 64 (4.48) | 57 (4.9) | 32 | 1 | 91 | 114 |
| Poland | 47 | (4.08) | 76(4.35) | 46(4.94) | 27 | 4 | 81 | 100 |
| Finland | 22 | (4.47) | 9(5.60) | 121 (3.7) | 30 | 39 | 134 | 131 |
| Sweden | 23 | (4.45) | 22(5.22) | 134 (3.4) | 26 | 70 | 135 | 133 |

* Rank -rank out of 141 (2015),** Score - scale ranges 1to 7

Source: designed by the author according to Global Competitiveness Report, 2016

One can conclude from the data summarised in the Table 3 that among its neighbouring countries, potential competitors in the tourism sector, Estonia has a positive rating and Poland has a higher rating whereas Latvia's (as well as

Lithuania's) rating is lower and significantly lags behind Finland, Sweden and Ireland. Analysing the price competitiveness factor Latvia has the lowest purchasing power parity and impact of fuel prices. Although the assessment is not high (91

¹ Ieva Bruksle Tel.:+371 29404321. E-mail address: ievab@turiba.lv

² Rosita Zvirgzdija Tel.:+371 26408253. E-mail address: Rosita@turiba.lv

and 100 out of 141 countries), it is the highest among the countries compared.

Specifics of pricing and factors influencing it in the Latvian business environment

We will further provide a short insight into the specifics of pricing in Latvian enterprises using the previous research.

Analysing macro- and micro-environmental factors and their influence on setting prices, it was pointed out that the purchasing power of the inhabitants, the number of buyers and the changes in the prices of resources (macro-environmental factors), as well as the level of expenses, the company targets and the competitors' activities (micro-environmental factors) have the most significant influence (Bruksle, Gode, 2012).

Moreover, we would like to point out that in accordance to the research Latvian entrepreneurs mainly set the prices themselves, most often it is the owner-manager of the company, who while setting the profit margin takes into account the main trends in the field based on the average price (significant aspect is the specifics of operation). Prices are reviewed at least once a year and according to possibility or necessity adjusted, which is influenced by changes in supplier prices. The continuous price changeability in Latvia, especially on basic raw materials, which hinders planning of operation and increases risk is mentioned as a significant hindrance in price-setting. The following were mentioned as the most important state activities for the promotion of competitiveness and stable prices: clear and predictable taxation policy, stable legislation, fighting the shadow economy, allowances for small enterprises. It should be noted that price-setting in companies is organized comparatively simply, without paying much attention to it (Bruksle, Gode, 2012).

Finally, we would like to mention that entrepreneurs have highlighted the following moments and aspects:

- 1) poor knowledge of pricing and chaotic pricing setting with lack of in depth research;
- 2) poor use of pricing as a competitive advantage in Latvia due to lack of information, experience and the belief in ability to implement something new;
- 3) pricing is hindered by: accessibility to resources and price fluctuations; attempts of entrepreneurs to conquer markets with unfounded low prices that distort the market; poor research of markets and prices;
- 4) regarding the active participation of enterprise managers in price setting it is acknowledged that managers should definitely participate and most often they do so but the majority lack the necessary knowledge;
- 5) reviewing the issue of pricing policy and price setting systems in enterprises it is acknowledged that such systems usually do not exist and well considered price setting is an exception rather than a business practice in most enterprises in Latvia (Bruksle, Gode, 2014).

The following can be mentioned as significant deficiencies in pricing practice in Latvian enterprises: lack of knowledge, absence of a complex approach, changing environment. Changing and unpredictable external environment hinders price setting as it is important for strategic planning to understand and predict the main factors that influence business operations such as costs, purchasing power etc. Research results show (Bruksle, Gode, 2011) that Latvia's price changeability and wide range of influencing factors which is a significant business risk does not promote competitiveness. Frequent changes in the economic environment (planned and unforeseen) do not promote stability and optimism and therefore hinder setting prices for products even when price is one of the important competitiveness factors.

Let's further focus on the problems concerning pricing mentioned in literature and those pointed

¹ Ieva Bruksle Tel.: +371 29404321. E-mail address: ievab@turiba.lv

² Rosita Zvirgzdija Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

out by entrepreneurs and experts in the panel discussions and expert interviews.

The following results were gained from the discussions.

- 1) According to entrepreneurs, only some factors mentioned ensure the competitiveness of the enterprise and products and price is underlined as one of the primary factors (first or second essential factor) with only 3 entrepreneurs not including price in their list of 5 significant factors. Of course, the price must correspond to the quality.
- 2) Costs and costing were mentioned as one of the essential factors in setting the price and therefore factors such as competitors' prices, changes in supplier prices and the market segment are significant.
- 3) Unfair pricing practices, the practice of competing with price cuts for basic products and offering additional services and products for a higher price were also emphasised.
- 4) The following aspects were highlighted as main problems: changing or distorted business environment; setting low prices when there is intense competition; various types of corruption that distort pricing; unfounded pricing (entrepreneurs acknowledge that often prices are "grabbed from thin air", as well as unscrupulous businesses); low market saturation with businesses.
- 5) Sustainability, unchanging rules of the game, game progress, carrying out research to analyse the market, consumer and trends are mentioned as significant aspects by entrepreneurs in setting prices.

The opinion of experts interviewed matches the opinions of the entrepreneurs mentioning price in the 5 essential factors that ensure the competitiveness of enterprises and products and only one expert did not mention price but highlighted the product's cost price. Moreover, it should be mentioned that on average experts rated price (3.5 out of 5 points) as one of the

tools ensuring competitiveness. Experts also underlined poor knowledge that hinders well considered pricing which in turn distorts the overall pricing policy in Latvia.

The main problems that hinder pricing mentioned were continuously changing legislation, unfair playing rules, very low production volumes and small markets. Experts also mentioned the wrong understanding of entrepreneurs of pricing as such and their inability to use this tool fully.

Finally, we would like to mention the experts' opinion that only experience and knowledge as well as a healthy business environment would enable us to resolve the problems concerning competitive pricing.

Regarding main problems in pricing that entrepreneurs face in practice, the following were underlined as the most significant ones: necessity to set elastic prices based on changing market conditions and costs; forecasting reaction in case of price fluctuations and further control of prices; differentiate clients, understand how much clients are ready to pay; low purchasing power but high price levels; short term thinking of market participants in setting unfounded prices, unfair pricing practices by competitors.

Conclusions, proposals, recommendations

- 1) Price in the opinion of entrepreneurs, experts as well as various researchers is a significant competitiveness enhancing factor.
- 2) Overall, the competitiveness of the Latvian business environment has been evaluated highly. However, in relation to main neighbouring business partner countries Latvia's performance is at a lower level.
- 3) Insufficient attention is paid to pricing in Latvian enterprises that does not allow using it comprehensively for ensuring competitiveness.
- 4) The changing and complex business environment, poor knowledge of pricing as

¹ Ieva Bruksle Tel.: +371 29404321. E-mail address: ievab@turiba.lv

² Rosita Zvirgzdija Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

well as unscrupulous pricing practices are main significant problems mentioned.

5) Significant information gained during the research will enable us to continue the research further.

Bibliography

Journal paper with author(s)

1. Bruksle, I., Abeltina, A., Zarina, V. (2016). KONKURETSPEJAS FAKTORI LATVIJAS BIZNESA VIDE. BAT XVII Starptautiska zinatniska konferences. COMPETITIVE ENTERPRISES IN A COMPETITIVE COUNTRY rakstu krajums. 35 - 48, EBSCO, ISSN 1691-6069, 2016
2. Bruksle, I. & Gode, N. (2012). Pricing Specifics in Latvian Enterprises, Economics and Management, Lithuania, No. 17 (2), pp 502 -508. ISSN 1822-6515, ISSN 2029-9338 (online)
3. Bruksle, I., Gode, N. (2014). " New Pricing Solutions in the Changing Latvian Business Environment ", International Multidisciplinary Scientific Conference on SOCIAL SCIENCES AND ARTS" Bulgarija, rakstu krajums, 01. - 04.10. 2014, ISBN 978-619-7105-30-8, 2015
4. Bruksle, I., Gode, N. (2012). Pricing Mechanism in the Changeable Modern Latvian Business Environment, Riga Technical University 53rd International Scientific Conference" conference proceedings [copactdisc], Latvia, 2012.
5. Dean, J. (1950). Problems of Product-Line Pricing. Journal of Marketing. Jan1950, Vol. 14 Issue 4, p518-528. 11p., Database: Business Source Complete
6. Enz, C.A., Canina, L., Lomanno, M. (2009). Competitive Pricing Decisions in Uncertain Times. CORNELL UNIVERSITY, Volume 50, Issue 3 325-341 , DOI: 10.1177/1938965509338550
7. Guiltinan, J.P. (1976). Risk-Aversive Pricing Policies: Problems and Alternatives. *Journal of Marketing*, Vol. 40 (January 1976), pp. 10-15.
8. Vasiljeva, L., Glebova, A. (2010). Razosanas uzņemumu konkuretspejas nodrošināšana Latvijā. Ekonomiskie pētījumi uzņēmējdarbībā. Nr.8, 2010, 51.-63.lpp. ISSN 1691-0737.

Books

9. Bruksle, I. (2013). *Cenu veidošanas būtība mainīgajā uzņēmējdarbības vide*. "Uzņēmējdarbības vide un tās attīstības aspekti" kolektīvā monogrāfija, Biznesa augstskola Turība, Rīga, 2013, ISBN 978-9984-828-72-5, 71.-105.lpp
10. Denisovs, M. *Regionu attīstības un konkuretspejas novertesana*. M. Denisovs, I. Judrupa. – Rīga: RTU, 2008. – 70 lpp.
11. Hirschey, M. (2008). *Managerial Economics*. - Cengage Learning.
12. Kotler, P., Wong, V., Saunder, J., Armstrong, G. (2005). *Principles of Marketing*. Prentice Hall Limited pp. 1199
13. Macdivitt, H., Wilkinson, M. (2012). *Value- Based pricing*. USA: The McGraw – Hill Companies, pp. 291
14. Mohamed, R. (2010). *The 1 % Windfall. How Successful Companies Use Price to Profit and Grow*. New York: HarperCollins Publisher, pp. 224
15. Raju, J. & Zhang, Z.J. (2012). *Smart Pricing*. Prentice Hall, NJ, pp. 212
16. Ruskin-Brown, I. (2008). *Practical Pricing for Results*. UK: Throgood Publishing, pp. 370
17. Stirving, M. (2011). *Impact Pricing*. Your Blueprint for Driving Profits, CWL Publishing Enterprise, USA, pp. 182
18. Marn, M.V., Regner, E.V., Zavada, K.K. (2004). *The Price Advantage*. Moscow: Alpina Business Book. PP 314

Internet sources

19. OECD Economic Outlook (2016). *OECD*. Retrieved: <http://www.oecd-ilibrary.org/> Access: 5.01.2017
20. The Global Competitiveness Report 2016-2017 (2016), ed Schwab K. *World Economic Forum* Retrieved: <http://reports.weforum.org/global-competitiveness-index/> Access: 5.01.2017
21. Travel & Tourism Competitiveness Report 2015 (2014). ed. Crotti R., Misrahi T. *World Economic Forum*. Retrieved: http://reports.weforum.org/travel-and-tourism-competitiveness-report-2015/?doing_wp_cron=1484731718.6114640235900878906250 Access: 5.01.2017

ASSESSMENT OF BUSINESS PERFORMANCE IN WASTE LANDFILLS AND SHIFTING TOWARDS CIRCULAR ECONOMY

Natalija Cudecka-Purina¹, PhD student; Dzintra Atstaja², Dr. professor

^{1, 2}, BA School of Business and Finance

Abstract. Latvian landfill management within the whole waste management system is currently experiencing an urgent necessity of new managerial approaches that will draw their sustainable development strategies. Main aim of this paper is to provide an oversight of the circular economy and industrial symbiosis – a potential solution for landfill waste management companies. In order to assess business performance of landfill management companies, a survey has been developed, which gathers opinions of Latvian, Estonian, Lithuanian, Russian, Spanish and Malaysian consultants, landfill management companies, state officials, associations, researchers etc.

Key words: business performance, circular economy, industrial symbiosis.

JEL code: M1, Q51, Q57

Introduction

Lately, Europe has started a very ambitious and at the same time environmentally conscious path towards zero waste concept, using circular economy policy. It has been sharply discussed since already 1980s whether a zero waste concept (Willson, 2011; Zaman, 2014; Benders et.al., 2016) is possible within current social and economic preconditions. Still, author suggests that a step forward circular economy or such concepts as industrial symbiosis is a good alternative – humans cannot prevent all the waste generated, but can minimize volumes going to the landfills and change their attitude towards waste.

Waste management may be divided into three stages: preliminary stage – from inhabitant to waste collection, which is most profitable, as it contains cleanest reusable materials; secondary stage – sorting waste on unsorted waste sorting facilities and tertiary stage – waste from waste landfilling process. Waste prevention alongside with 3R activities are widely discussed and promoted within the EU, thus much less attention is being paid to waste or resources that are generated during waste disposal processes. This is explained with the fact that the EU sees landfilling as yesterday waste treatment option, but there are 13 Member States, which still heavily rely on it. For these countries, industrial symbiosis to save resources and move towards circular economy on the landfills could become a good mid-term solution. Analysis of current

situation with Latvian landfill management companies has revealed a very negative trend that some of the companies have problems with keeping together managerial, entrepreneurial and environmental decisions – companies dealing only with landfilling are interested in the increase of disposed waste volumes, but this goes into a direct conflict with EU Directive on waste, saying that Member States are to focus on decrease of disposed waste as much as possible.

The hypothesis set within present research is formulated as follows: increase of efficiency in landfill management companies is possible with improvement of business management techniques. Main tasks of the research are: assessment of landfill internal material flow and its potential for development of industrial symbiosis; development of a methodologically justified industrial symbiosis model for landfills. The research is based on quantitative and qualitative methods, including a survey, data analysis, systems dynamics, modelling methods. The authors propose a methodological solution to enhance more efficient resource management by using resources, generated as a result of a landfill daily operation, thus increasing resource efficiency indicators and shifting Latvian economy to circular economy with the help of industrial symbiosis.

Key concepts of circular economy

Circular economy appeared in the literature through three main activities - the so called 3R's Principles: Reduction, Reuse and Recycle (Feng

and Yan, 2007; Preston 2012). More practically explained by Heck (2006), Circular Economy means reducing resource use and reducing the load on our natural sinks. The CE concept is central part of the ecological economy and the industrial ecology. It has to be noted that circular economy concepts have already becoming adopted on national levels. For example in China, where environmental protection is a very important issue, already in 2009 Circular Economy Law has been passed and entered into force. Austria, Germany, and the Netherlands have to some extent already developed strategies compatible with circular economic activities (Heck, 2006). As highlighted by Morone, Navia (2016), the purpose of consumption is to increase consumer's utility and/or enhance social welfare. However, at each stage of the supply chain, waste is produced. To some extent this waste might be recycled and reconverted into resources, reducing the need to mine virgin resources and, through this, the economy becomes circular. Yet, not all waste can be recycled or is recyclable, partly owing to missed opportunities and partly owing to basic physical and thermo-dynamical laws. The amount of waste that can be recycled depends crucially on the capacity of the environment to assimilate residuals from the economic system. Once the assimilative capacity is exceeded, environmental damage occurs.

Circular economy is seen as a new business model expected to lead to a more sustainable development and a harmonious society (Geng and Doberstein, 2008; Ness, 2008; Mathews and Tan, 2011; Lett, 2014). Although, the UK government has recently released responses to the EU circular economy package, listing barriers to adoption (Department for Environment, Food and Rural Affairs, 2015a, 2015b; Environmental Audit Committee, 2014). These include regulatory, financial, information, and systemic barriers. Many of these barriers can be assisted through greater quantification of the waste flows.

As emphasized by George *et al.* (2015), recycling is now a significant aspect of most developed economies and an important objective of policy, so it is time to bring the aforementioned concept of the circular economy into theoretical consideration. That is, economic waste and economic resources are interrelated and they can no longer be considered to be independent. It is now time to weave them tightly together.

Circular economy does sound very reasonable and logical as a concept, but in reality it is often facing a range of obstacles such as high initial costs, necessity of changing habits and system on the whole. One of the main changes promoted by the European Commission since 1993 – the tax burden must be redistributed so as to lighten the burden on labour and increase the burden on the use of natural resources (EC, 1993).

Salemdeeb *et al.* (2016) note that in order to achieve a circular economy, there must be a greater understanding of the links between economic activity and waste generation. A consensus exists on the vital role of waste and resource management in achieving a transition from a linear model to a circular one where the value of materials and resources are maintained in the supply chain. Waste systematically emerges throughout the supply chain as a result of economic activities and trades (Kurz, 2006).

Necessity of industrial park establishment within waste management

Back in the twentieth century, Alfred Marshall (1920) has already described the advantages of agglomeration of economic activities. Marshall proved that due to the concentration in close geographical proximity within "industrial districts" the companies get the benefit of large – scale industrial production and of technical and organizational innovations. The economist emphasized the possibility of achieving the advantage of a large scale production by a group of small-sized companies located in a given area.

It was mainly possible due to the benefits coming from agglomeration economies, such as reduction of transaction costs, accumulation of skills among workers, creation of "an industrial atmosphere", promotion of innovation processes.

Later on, basing on Marshall's theory, Michael Porter has developed and popularized cluster concept. According to the Porter's (2008) definition, "clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries and associated institutions (e.g. universities, standards agencies and trade associations) in a particular field that compete but also cooperate". When developed further, a cluster is defined as a set of entities from similar or related sectors that are geographically close to each other (Pouder & St John, 1996); generating certain externalities that stem from economic, social and historic factors (Becattini, 1990; Porter, 1990; Rocha & Sternberg, 2005).

Clusters, which form networks of firms and other institutions, are receiving growing attention in the literature on management (Gilbert et al., 2008; Rocha & Sternberg, 2005; Tallman et al., 2004).

A further definition states that the cluster is a knowledge production centre (Tallman et al., 2004), that is characterized by the transference of knowledge and information between its members (MacKinnon *et al.*, 2002).

One of the roots of this discussion is in the concept of industrial ecology, which in turn was an attempt to face the problems that were related to resource consumption, waste production, and emission, by an integrated approach (Lambert, Boons, 2002). Patala et al. (2014) stress that network-based collaboration is critical to the solution of complex problems such as the environmental load of production and consumption.

Porter (1998) indicates that clusters affect competition in three ways: first, by increasing the productivity of companies based in the area;

second, by driving the innovation; and third, by stimulating the formation of new businesses, which expands and strengthens the cluster itself. Clusters can be divided into industry, sector and problem solving.

- Doeringer and Terkla (1995) examine the literature regarding industry clusters and identify them as geographical concentrations of industries that gain performance advantages through co-location. According to Zhao et al. (2009), "Geographical concentration" is the key that defines the basic but distinctive characteristic of an industry cluster. Industry clusters can be classified into two types.
- Vertically integrated clusters. This type of clusters is made up of industries that are linked through buyer-seller relationships.
- Horizontally integrated clusters. This type of clusters includes industries, that might share a common market for the end products, use a common technology or labor force skills, or require similar natural resources.

The development of industries is led by innovation, assimilation and utilization of technology that chiefly depends on the economy, society, culture, habits, systems and policies embedded in a specific geographical context.

Within waste management two terms as "clusters" and "industrial parks" are often used in order to describe one type of development. According to Matani (2006), industrial estates are primarily designed to improve production efficiency through the clustering of manufacturing industries and services but most of them are posing a danger to the environment. If environmental concerns are integrated into estate development at all stages, cumulative damaging effects can be avoided.

There is a strong association between IS and improved competitiveness in the IS literature (Geng and Cote, 2002), often attributed to improved natural resources productivity (Esty and Porter, 1998). In experience of Lombardi,

Laybourn (2012), the opportunities to improve competitiveness through industrial symbiosis are much broader than improved resource efficiency. They include reducing cost through innovative product or process changes, increasing revenue, diversifying business, and managing risk (Laybourn and Morrisey, 2009). The importance of each synergy being demonstrable as an economically beneficial business deal has been documented for Kalundborg (Chertow, 2007), Rotterdam Harbor, networks in Austria and Germany (Posch 2010), and more generally (van Berkel 2006). In Kalundborg, a number of independent energy and waste exchanges between collocated companies and the local municipality evolved over a number of decades, resulting in economic benefits for all parties involved (Jacobsen 2006).

According to Matani (2006), the tangible environmental benefits include :

- reducing greenhouse gas emissions and toxic air emissions;
- promoting green technology development and diffusion;
- improving energy, materials and water use efficiency and conservation;
- promoting pollution prevention on a system or community basis;
- promoting the redevelopment of brown field industrial sites.

Kernels of symbiosis across firms, such as sharing ground water or a specific material, are observed to be necessary preconditions for what sometimes become more extensive exchange networks. Certain identifiable precursors of symbiosis, such as co-generation or waste water reuse, also emerge from business decisions often rooted in regulatory situations and can lead to more extensive symbiotic cooperation as well (Chertow, 2007).

Within present research, the authors tend to develop an industrial symbiosis model not as it has often been historically developed – from an industry district, but using currently existing

waste management infrastructure element, i.e. household waste landfill, which already offers following main resources: electricity, heat, waste water treatment, technical water, infrastructure.

Research results and discussion

Latvian waste management system started its active development since 1995, when first country inventory revealed over 550 operating sub-standard landfills, not corresponding EU requirements and over 160 closed sub-standard landfills. The programme "500- Development of national waste management system" foresaw division of the territory into 10-12 waste management regions, with one landfill per region, closure and re-cultivation of all sub-standard landfills. In 2017, Latvia is divided into 10 waste management regions, has 11 landfills in operation, all the sub-standard landfills are no longer operating and are re-cultivated. Although, it is vital to mention, that the country has been also affected by the global recession, which resulted in decrease of income and waste generation per capita, as well as it has experienced serious decrease in population. Currently, one biggest landfill is disposing 58 % of total waste designated for disposal, and the rest landfills are disposing from 8 % up to even 1 % of waste. Thus, the fact that the landfills have financial liabilities and the European Union proposal of decreasing volume of disposed waste to 10 % from the generated volume in 2030 leads to a necessity of assessment of current landfill management situation and seeking for alternative development scenarios.

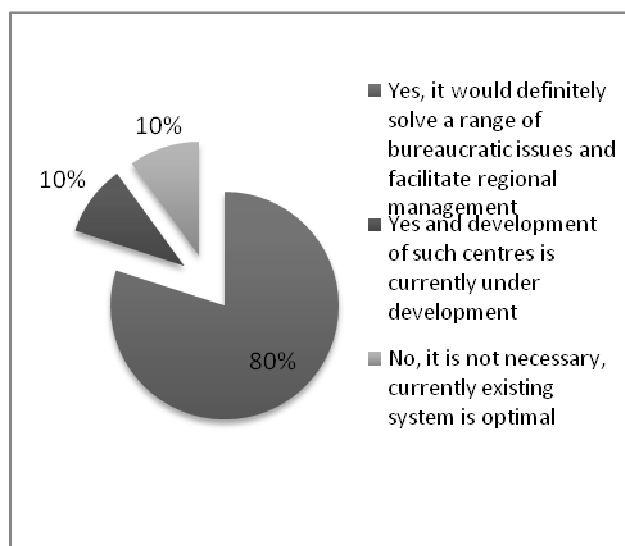
In order to analyse Latvian landfill management companies and to identify necessity of their managerial improvement, the author has developed a survey. The survey consists of 19 open and closed-type questions and it is divided into three sub-sections. First sub-section covers landfill management companies, their functions, output of landfill daily operation activities, potential resources for industrial symbiosis and disposal rates. Following sub-section covers

waste management tendencies in Latvia, it is aimed to disclose landfill management company's vision on further development. And the last subsection tackles decision-making practices in waste management companies. The target groups have been divided into "Landfill group" and "Expert group". As the target audience of the research within Latvia is only 11 inter-municipal landfill management companies, they all participated in the survey. In addition, author has modified the same survey for experts in the waste management field – these cover both Latvian and foreign experts. As a result, it was possible to receive response from Latvian, Estonian, Lithuanian Ministries of environment, Lithuanian and Estonian landfill management companies, Latvian, Estonian, Lithuanian, Russian, Spanish and Malaysian consultants, representatives of different associations and researchers.

First two questions covered development of regional waste management centres (figure 1) and taking over particular municipality functions and executing public procurement in respect to waste collection in the region and develop binding regulations for waste management in the region (figure 2).

It can be seen, that 80 % of the landfill management companies are in favour of development of regional waste management centres. The concept of regional waste management centre is that the main infrastructural element of the region – in Latvia's case it is a waste landfill, it's management company, which is inter-municipality founded, would take over all region's municipality functions, including but not limited to inhabitant education, ensuring 100 % coverage of the inhabitants within waste management system, public procurement for waste collection and/or treatment services, liability for the targets set for waste recycling and reuse as well as disposal etc. This would facilitate administrative burden for the municipalities, provide a more objective and

transparent statistical information of the region and might result in better waste collection price for the inhabitants, as the waste management operator would be chosen for the whole region, not for a single municipality. When analysing the responses, provided by the Expert group, 86 % of respondents were in favour of development of regional waste management centres, to which municipalities could delegate all the functions, linked with waste management and 14 % are supporting currently existing system. When analysing the same question from statistical point of view, it resulted in Mean equalling 1.2917, median and mode equalling 1 and standard deviation – 0.69025.

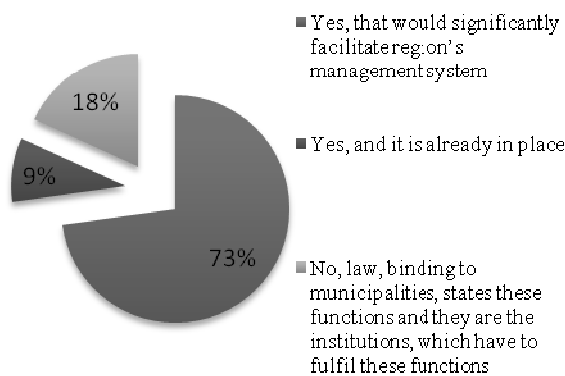


Source: developed by authors

Fig. 1. Question "Do you consider that waste management regions have to have regional waste management centres, to which municipalities could delegate all the functions, linked with waste management?"

Figure 2 proves readiness of landfill management companies to adopt a range of municipal functions, including the public procurement for waste management. Moreover, it also shows that there are already waste management regions within country, which have taken over the public procurement function. Some of the regions face strong municipalities, willing to control waste management functions by themselves, although it has to be noted that economies of scale are also in place within waste management system, so the bigger waste

collection territory with higher inhabitant density, the lower the price for waste collection service.



Source: developed by authors

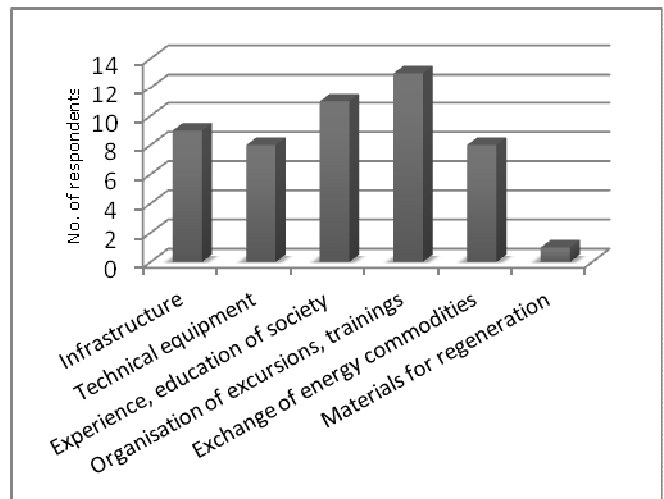
Fig. 2 Question "Would you, as landfill management company, take over particular municipality functions and execute public procurement in respect to waste collection in the region and develop binding regulations for waste management in the region?"

It is quite notable, that the Expert group's opinion split in this question, as both 43 % of respondents support delegation of municipal functions to landfill management companies and state that these functions have to stay in competence of the municipalities. 14 % of the Expert group point out that definitely some of the functions can be taken over by landfill management companies, but, as waste management in general is the competency of municipalities, core functions have to be kept for them as main responsible stakeholders.

The questionnaire also assessed the resources that arise in the landfills during their daily operations. According to the results of the Landfill group, most common resources are: sorted packaging materials, other reusable materials with commercial value and purified leachate (70 % per option), followed by resource derived fuel (RDF) and technical compost (60 %), electric energy and heat, generated only by 40 % of respondents and compost for agricultural needs (20 %) and compost for road construction works provided by 10 % of respondents.

When analysing, what are the resources that could be offered for other companies that are either not used in an efficient manner, or not used at all, the Expert group has identified

following resources (Fig. 3). It also pointed out that the landfills should be as open as possible to educate people to sort waste. Next step is to promote waste reduction and prevention. That means promotion of repair and reuse, especially for electric, electronic and bulky waste. When analysing the responses of the landfills, they see themselves fully involved in sharing experience, education of the society (80 %), organization of excursions and trainings (90 %), followed by technical equipment (60 %), infrastructure required for establishment of business (fenced territory, supply road, premises etc.) (50 %) and exchange of energy commodities (30 %).



Source: developed by authors

Fig. 3 Question "Which resources landfill management companies could offer for outsource?"

Taking into account current circumstances and prospective for 2020 and 2030, it is of vital importance to ensure sustainable development of landfill management companies as well as their feasibility.

One of important questions within the questionnaire was "What could be as a stimulating factor for a landfill management company to involve into industrial symbiosis?" Landfill management companies point out as the most stimulating factor 44 % of respondents - education of the society, explaining that modern landfill is environmentally safe and different types of manufacturing can be allocated within its territory. This is followed by necessity of development of state support programmes in

order to facilitate cooperation of different sectors – identified by 39 % of respondents. 6 % see the main obstacle in legislation, pointing out that it has to be redeveloped in order to promote interdisciplinary cooperation. On the other hand, 11 % of the respondents consider that the existing legislation is sufficient and the companies themselves already start to develop industrial symbiosis on landfill basis. When turning to Expert group, within the same question, 48 % of respondents support the idea of state aid necessity, followed by reconsideration and revision of legislative base (24 %) and only 14 % of the respondents consider the legislative basis to be sufficient and 14 % of Expert group stress the necessity of society education.

Ambitious goal has been set by European Commission for 2030 – to ensure decrease of waste disposal to 10 % of generated waste for all member states. Although, Latvia is among those countries, which will have this target the most challenging and within current situation, it even looks like unachievable. This is also tackled by the Expert group under a question "Taking into consideration the new provisional goal set by the European Commission to dispose only 10 % of waste, what is your vision to ensure landfill efficiency and sustainability?" Expert group states the first and key action is to be the transformation of landfills into waste recycling and/or recovery centres (86 % of respondents). It is interesting, that the experts from governmental organizations see the solution in development of regional waste centres (on the basis of waste management regions, where municipalities delegate their rights in waste management issues to a Regional waste centre, which also would inherit the obligations, which are set for municipalities) – this initiative was mentioned by 43 % of polled experts. Third identified activity (39 % of respondents) was implementation and further development of waste prevention programme alongside with focus on increase of inhabitant awareness. Quite

interesting that Landfill group had different set of required actions: Technological shift; Develop recycling of biodegradable waste; Improvement of waste sorting at households; Landfill support on state level; Development of regional waste management centres; Participation in international projects; Development of end of waste criteria's; Development of material recycling within the country; Increase of disposal rate to the EU level.

Disposed waste opens wide possibilities for industrial symbiosis. Taking into account wide range of activities in the field of waste management such as prevention, recycling, sorted waste collection, re-use etc., the volume of waste landfilled is going to decrease with disposal rate increasing. Industrial symbiosis is economically reasonable solution in such situation – so called contradiction-sustaining mechanism. The developed model will allow inter-municipal waste management company to increase effective management of the resources that are being developed during its daily operations as well as to move towards circular economy and have an impact on waste minimization. Different types of the resources have different life-cycle. For example, electricity and heat generation from methane has approximate active lifespan of 30 years and further 10-15 years will be generating minimum level of resources. This means that landfill management company has to take into account the status quo of the landfill and evaluate strategies for long-term, mid-term and short-term development. On the other hand this decrease of the resources may be compensated by generation of wind power station on the re-cultivated part of the landfill, which will be high enough and without high trees, to ensure efficient operation of the generator. All these current resources, their life-cycle and substitution possibilities have to be taken into account when choosing optimal industries/modules.

Landfill management companies have also to consider possibility of variable structure,

depending on seasonal market requirements. The research has led to the development of four balance functions that will allow landfill management companies to evaluate resources that can be used for industrial symbiosis and, depending on their volume, will be able to construct a decision making tree for optimal development strategy. The authors have come out with following equation, offering resource, electrical, thermal and technical water balance:

$$\left\{ \begin{array}{l} Q_{rw} + Q_{fi} + Q_{sl} \leq R \\ \sum_{j=1}^K E_{1,j} + \sum_{i=1}^T E_{2,i} \leq E \\ \sum_{j=1}^K T_{1,j} + \sum_{i=1}^T T_{2,i} \leq T \\ \sum_{j=1}^K W_{1,j} + \sum_{i=1}^T W_{2,i} \leq W \end{array} \right. \quad (1)$$

Where: Q – waste; rw – return waste; fi – for industries; sl – second level; R – resources; E – electricity balance; T – thermal balance; W – technical water balance; i – type of resource; j – industry.

The developed balance functions allow assessment of current status quo of the landfill. Figure 4 depicts possible industrial symbiosis model, offering cooperation between the modules. Basing on this model, the landfill management company is able to choose best suitable modules, which then can be constructed by it or a cooperation model with the desired industry can be offered. Further on, developing the industrial symbiosis, other industries can join the symbiosis, not necessarily interacting directly with landfill, but sharing resources with other modules.

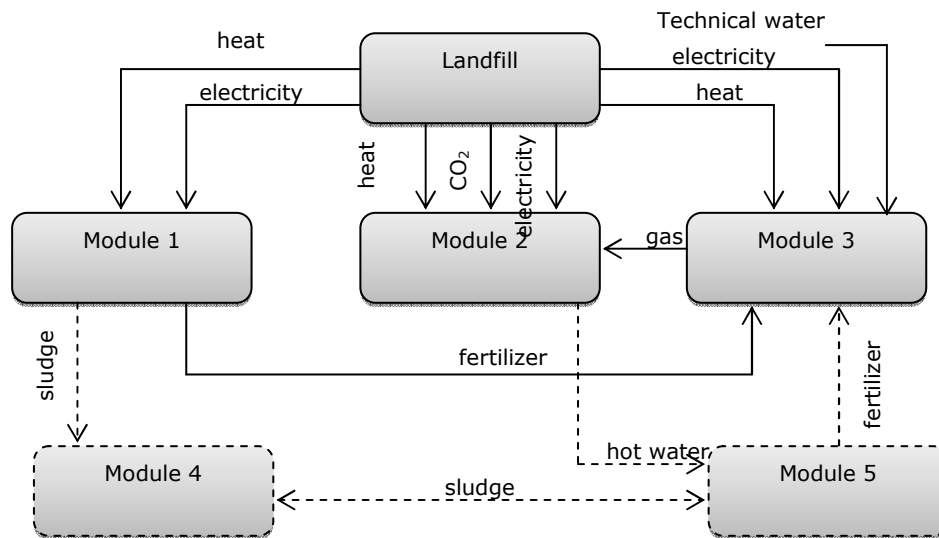


Fig. 4. Industrial symbiosis model

Source: developed by authors

Conclusions, proposals, recommendations

- 1) System management in waste management field in Latvia differs across regions and no unified approach has been developed.
- 2) Assessment and management of the waste/resources being generated on a landfill, i.e. launching Industrial symbiosis could be a solution especially for landfill management companies engaged only in landfilling.

- 3) Industrial symbiosis model has a direct impact on effective resource management and increase of cooperation links within the industries, thus decreasing consumption of primary resources and minimizing waste generation volumes.
- 4) Wide ranges of options exist for a landfill to take part in circular economy, developing an industrial symbiosis area. Such development will not only impact resource saving but also have a beneficial impact on the inhabitants,

keeping stable or avoiding rapid increase of waste collection services.
disposal fee and the cost for inhabitant for

Bibliography

1. Becattini, G. (1990). *The Marshallian Industrial District as a Socio-economic Notion*. In F. Pyke, G. Becattini, & W. Sengenberger (Eds.), *Industrial districts and inter-firm co-operation in Italy* (pp. 37–51). Geneva: International Institute for Labor Studies.
2. Benders, J., Dimante, D., Atstaja, D., Tambovceva, T. (2016). Development of Business Education for Circular Economy in Latvia. *New Challenges of Economic and Business Development – 2016 May 12–14, 2016*, Riga, University of Latvia pp 168-179 ISBN 978-9934-18-140-5.
3. Chertow, M. (2007). "Uncovering" Industrial Symbiosis. *Journal of Industrial Ecology* 11(1): 11–30.
4. Department for Environment, Food and Rural Affairs (2015a). *UK Response to European Commission Consultation of Member States on the Circular Economy*. London: Department for Environment, Food and Rural Affairs, pp.1–19.
5. Department for Environment, Food and Rural Affairs (2015b). *UK Response to European Commission Public Consultations on the Circular Economy and on the Functioning of Waste Markets*. London: Department for Environment, Food and Rural Affairs, pp.1–5.
6. Doeringer P.B., Terkla D.G. (1995). Business Strategy and Cross-industry Clusters. *Economic Development Quarterly* 1995; 9: 225–37.
7. Environmental Audit Committee (2014). Growing a circular economy: Ending the throwaway society (July), p.43
8. Esty, D. C. and M. E. Porter. (1998). Industrial Ecology and Competitiveness: Strategic Implications for the firm. *Journal of Industrial Ecology* 2(1): 35–42
9. European Commission (1993). Growth, Competitiveness and Employment. Challenges and the Ways Forward into the 21st Century. White paper parts A and B. COM(93) 700, Brussels
10. Feng, Z., Yan, N., (2007). Putting a circular economy into practice in China. *Sustain. Sci.* 2, 95-101.
11. Geng, Y. and R. P. Cote. (2002). Scavengers and Decomposers in an Eco-industrial Park. *International Journal of Sustainable Development and World Ecology* 9(4): 333–340
12. Geng, Y., Doberstein, B., (2008). Developing the Circular Economy in China: Challenges and Opportunities for Achieving "Leapfrog Development". *Int. J. Sustain. Dev. World Ecol.* 15, 231-239.
13. George, D.A.R., Chi-ang Lin, B., Chen, Y. (2015). A Circular Economy Model of eEconomic Growth. *Environmental Modelling & Software* 73 60-63.
14. Gilbert, B. A., McDougall, P. P., & Audretsch, D. B. (2008). Clusters, Knowledge Spillovers and New Venture Performance: An Empirical Examination. *Journal of Business Venturing*, 23, 405–422.
15. Heck, P. (2006). Circular Economy Related International Practices and Policy Trends: Current Situation and Practices on Sustainable Production and Consumption and International Circular Economy Development Policy Summary and Analysis. Institute for Applied Material Flow Management (IfaS), Environmental Campus Birkenfeld.
16. Jacobsen, N.B. (2006). Industrial Symbiosis in Kalundborg, Denmark: a Quantitative Assessment of Economic and Environmental Aspects, *J. Industrial Ecology* 10 (2006) 239-255.
17. Kurz H.D. (2006). Goods and Bads: Sundry observations on joint production, waste disposal, and renewable and exhaustible resources. *Progress in Industrial Ecology* 3: 280–301.
18. Lambert, A.J., D., Boons, F.A. (2002). Eco-industrial Parks: Stimulating Sustainable Development in Mixed Industrial Parks. *Technovation* 22 (2002) 471–484.
19. Laybourn, P. and M. Morrissey. (2009). National Industrial Symbiosis Programme: The Pathway to a Low Carbon Sustainable Economy. Kings Norton, UK: International Synergies Ltd
20. Lett, L.A., (2014). Las Amenazas Globales, el Reciclaje de Residuos y el Concepto de Economía circular. *Riv. Argent. Microbiol.* 46 (1), 1-2.
21. Lombardi, D.R., Laybourn, P., (2012). Redefining Industrial Symbiosis. Crossing academic-practitioner boundaries. *J. Ind. Ecol.* 16 (1), 28-37.
22. MacKinnon, D., Cumbers, A., & Chapman, K. (2002). Learning, Innovation and Regional Development: A critical appraisal of recent debates. *Progress in Human Geography*, 26, 293–311.
23. Marshall, A. (1920). *Principles of Economics* (8th. ed.), London: Macmillan and Co.
24. Matani A.G. (2006). Strategies for Better Waste Management in Industrial Estates. *Journal of Industrial Pollution Control*; 22: 67-72.
25. Mathews, J.A., Tan, H., (2011). Progress towards a Circular Economy: the Drivers and Inhibitors of Eco-industrial initiative. *J. Ind. Ecol.* 15, 435-457
26. Morone, P., Navia, P. (2016). New Consumption and Production Models for a Circular Economy. *Waste Management & Research*, Vol. 34(6) 489–490
27. Ness, D., (2008). Sustainable Urban Infrastructure in China: towards a Factor 10 Improvement in Resource Productivity through Integrated Infrastructure system. *Int. J. Sustain. Dev. World Ecol.* 15, 288-301.
28. Patala, S, Hamalainen, S, Jalkala, A, Pesonen, H-L (2014). Towards a Broader Perspective on the Forms of Eco-industrial Networks. *Journal of Cleaner Production* 82(0): 166-178
29. Porter, M. E. (1990). *The Competitive Advantage of Nations*. New York: Free Press.
30. Porter, M. (1998). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. - Free Press; 1 edition, ISBN-10: 0684841487, 397 p.

31. Porter, M. (2008). Clusters and Competition: New Agendas for Companies, Governments and Institutions. On Competition (pp. 213–303), Harvard business press.
32. Posch, A. (2010). Industrial Recycling Networks as Starting Points for Broader Sustainability-oriented Cooperation. *Journal of Industrial Ecology* 14(2): 242–257
33. Poudier, R., & St John, C. H. (1996). Hot Spots and Blind Spots: Geographical clusters of firms and innovation. *Academy of Management Review*, 21, 1192.
34. Preston, F., 2012. A Global Redesign? Shaping the Circular Economy. Briefing Paper. Retrieved: [http://www.chathamhouse.org/sites/default/files/public/Research/Energy %20Environment %20and %20Development/bp0312_preston.pdf](http://www.chathamhouse.org/sites/default/files/public/Research/Energy%20Environment%20and%20Development/bp0312_preston.pdf) Access:08.01 2017 .
35. Rocha, H. O., & Sternberg, R. (2005). Entrepreneurship: The Role of Clusters Theoretical Perspectives and Empirical Evidence from Germany. *Small Business Economics*, 24, 267.
36. Saleemdeeb, R., Al-Tabbaa, A., Reynolds, C. (2016). The UK Waste Input-output Table: Linking Waste Generation to the UK Economy *Waste Management and Research* 34: 1089-1094
37. Tallman, S., Jenkins, M., Henry, N., & Pinch, S. (2004). Knowledge, Clusters, and Competitive Advantage. *Academy of Management Review*, 29, 258.
38. Wilson, DC (2011). Acting Alone to Partnerships – Strategic Approach for Sustainable Municipal Waste Management. Proceedings of UN-Commission for Sustainable Development (CSD) Intersessional Conference on Building Partnerships for Moving towards Zero Waste, Chinzanso, Tokyo, Japan. Retrieved: <http://www.uncrd.or.jp/env/110216csd19.htm> Access:25.12 2016
39. van Berkel, R. (2006). Regional Resource Synergies for Sustainable Development in Heavy Industry Areas: An Overview of Opportunities and Experiences. Perth, WA, Australia: Curtin University of Technology
40. Zaman, A.U. (2014). Identification of Key Assessment Indicators of the Zero Waste Management Systems *Ecol. Ind.*, 36 (2014), pp. 682–693
41. Zhao , W., Watanabe , C., Griffy-Brown , C. (2009). Competitive Advantage in an Industry Cluster: The case of Dalian Software Park in China. *Technology in Society* 31 (2009) 139–149.

ECONOMIZATION OF TOURISM: RESEARCH DISCOURSE

Andrzej Czyzewski¹, Prof.; Brelik Agnieszka² Assoc. Prof.

^{1, 2} University of Economics, Department of Macroeconomics and Food Economics and Department of Economy Policy and Tourism

Abstract. The aim of the paper was to present a research discourse of theoretical literature studies on problems related with economization of tourism industry. Authors' considerations focus on the discussion of multidisciplinary and interdisciplinary research on tourism. A critical analysis of the contribution of both of these approaches in the development of theoretical bases of tourism as a science was made. The authors of the paper have revealed the importance of the economics of tourism and special attention was drawn on facts that tourism has become one of the most important sectors of the global economy. The new paradigms of economization of tourism arise owing to the economic impact of services on the development of global economy, which determines the need for revision of the former tourism basic postulates and research focuses.

Key words: tourism, economy, sustainable development.

JEL code: E02, H23, Q18

Introduction, the genesis of the problem

Troisi, who published *Teoria economica del turismo e della rendita turistica* (The Economic Theory of Tourism and Tourism Rent) (Lazarek, 2002) in 1955, can be considered the author of the basics of tourism economics. As a scientific discipline, in the opinion of numerous researchers (Dwyer, Forsyth, Dwyer 2010; Stabler, Papatheodorou, Sinclair 2010; Tribe 2011; Tribe, Xiao 2011), in the 21st century, the economics of tourism became an interdisciplinary subject, including the theoretical bases and knowledge of tourism. The development of this discipline was determined both by the need for scientific research, didactics, and economic practice in tourism itself, as well as the strong connections between the tourism sector and nearly every other sector of the economy (Panasiuk, 2006).

Due to a large variety, it is questioned whether the agricultural resource conditions in particular EU regions constitute a determinant of the share of subsidies for public goods in the total amount of subsidies in the EU. It was decided to study this phenomenon through a paper with the following hypothesis: the resource conditions in the EU constitute a quality predictor for the share of subsidies for public goods in the total amount of subsidies from the Common Agricultural Policy.

According to The World Tourism Organisation, Tourism is considered a multidimensional phenomenon and in this sense, its scope covers both various areas and various disciplines of sciences. Former studies of this issue performed by representatives of different areas of science representing various research centres such as W. Kurek, W. Alejziak, W. Alejziak, G. Golembki, L. Butowski, J. Cooper, E. Elgar, Cheltenham, C.R. Goeldner, J.R. Brent, N.J., Hoboken, C. Cooper, J. Fletcher, A. Fyall, D. Gilbert, S. Wanhill indicate the huge variety of research issues and findings related to this research area¹.

Tourism became a subject of interest for economists towards the end of the 19th century and before the World War I (Lazarek, 2001). This is reflected by the arrangements made during the first international study conference on the state and economic life, organised under the aegis of the League of Nations in Milan in 1923. In spite of the fact that various research approaches can be used for the research of economic phenomena (theoretical, which dominates in so-called academic economics, institutional, historical or historical-institutional, and geographic or geographical-natural), the authors of this publication focused on the economic aspects of tourism. These can be perceived in many ways, given the role that

¹ Research on tourism is carried out primarily by the Central Statistical Office of Poland, the Polish Tourist Organisation, the Institute of Tourism, and higher education institutions.

tourism plays in the economy, both in individual regions and countries and globally. It should be emphasised that the concepts for the development of tourism are not autonomous. They find their theoretical basis in universal concepts of socioeconomic growth and development (this concerns in particular the regional and local level), based on the paradigms of modernisation, dependence, neoliberalism, and alternative development (Kozak, 2008), which is the subject of this considerations.

The aim of the authors' study was to present an overview of the importance of the economics of tourism and its research discourse.

The specific research tasks to reach the aim were:

- 1) to describe tourism as an interdisciplinary subject;
- 2) to reveal tourism in the economics theories.

The research is based on literature studies, the method of analysis as well as synthesis were used in the current study.

Research results and discussion

The place of tourism in the economic theories

The diversification of the contemporary global economy makes it impossible to point to a single economic theory which would constitute an exhaustive paradigm of economics. Various research approaches have to be used to examine economic phenomena (Bartkowiak, 2010). The concepts of development of the tourism economy are usually not autonomous, but find their theoretical basis in universal concepts of development (Nawrocka 2010). As observed by Kozak (Kozak, 2008), four main contemporary theoretical trends can be distinguished in development sciences: modernisation, dependence, alternative development, and neoliberal development.

The paradigm of modernisation includes Rostow's stages of economic growth model, Toffler's three waves concept, and Smelser's convergence theory and structural differentiation

theory. The theory concerning modernisation refers to switching from a non-modernised society to modern society. Tourism as a sub-discipline occupies an important place in socioeconomic transformations. The economic content of the phenomenon of tourism manifests itself in economic activity aimed at preparing a region of tourist traffic reception to receive tourists, and in the creation of sources of income in the service sphere. The open nature of a tourist region is connected with transforming expenditure into goods and services in order to achieve the final results. The system is characterised by the repeatability of the cycle of transforming expenditure into results of activity through feedback. In a tourist region, individual stakeholders use the resources at their disposal in order to provide tourists with various goods and services as part of the activities they are engaged in. Tourists are therefore recipients of the system, and their satisfaction with the offer allows them to achieve individual goals. Tourism leads to the creation of new service fields and the manufacturing of new products, and so it stimulates economic activity. It changes the size and structure of the population's expenses, brings the transfer of people and the transfer of means of payment, which takes place not in the place where they work and earn a living, but in the place where the tourists stay. Thanks to economic processes, it is possible to meet the tourists' needs, so that they are satisfied with their stay. The results of the transformation of expenditure into effects may be of economic or non-economic nature (Nir, 1990). Moreover, the effects of changes in the system may be both positive and negative. It needs to be remembered that the development of tourism also involves: environmental pollution, exceeding tourist capacity, social pathologies, etc.

The particularly important theories in shaping the concept of the development of tourism include the location theories, deriving from work undertaken in the 19th century by Thunen and

introducing the concept of location rent (Domanski, 2002) and the central place theory (Christaller, 1993). Domanski (1989) described the spatial arrangement of interactions in territorial socioeconomic systems, defining it as a physical field, and describing it with the use of the negative distance function. Spatial barriers affect the deviations of the actual network from the regular, optimal or most probable network. Christaller (1993) emphasised the hierarchical nature of the settlement network, in which a small number of the largest centres provide services (perform a function) of the largest spatial range, whereby they are dominating centres, controlling the flow streams in the direction of "non-central" areas. Christaller was one of the first researchers to transfer economic concepts to the sphere of tourism research, concluding that the following elements: tourist places, type of visitors, tourists' experiences and the tourism product, impact on the place, and the involvement of the local population changes over time (Kozak, 2008). According to Christaller (1963), areas suitable for leisure tourism are usually created in peripheral regions and form the core of the tourist space.

Concepts drawing on the already classical growth pole theory of Perroux make up a broad group of development concepts (Kozak, 2008). The significance of the development of tourism for the global economy makes it possible to consider it as a growth pole within the meaning of the above-mentioned theory. On a global scale, it is characterised by considerable size (both in terms of the number of tourists and the income from tourism), it achieves rapid, above-average growth, it is characterised by strongly developed links with other types of economic activity, and has a clearly distinctive position in the market.

Modernisation, structuralism, and neoliberalism promote the development of tourism, treating it solely as a field of the economy, a source of income, and an important

component of consumption. The first dysfunctions of the development of tourism resulting from basing the country's economic growth solely on tourism were observed already at the end of the 1960s and the beginning of the 1970s. The impact of tourism on spatial order may be an effect of development, or lead to the degradation of the spatial environment. There is a risk of negative externalities occurring, concerning both the natural and the socioeconomic environment (Kachniewska, 2011). These phenomena also affected the orientation of research towards the theory of sustainable development. The source literature does not offer exhaustive answers to questions concerning the possibility of stimulating the desired sustainable development through tourism. On the one hand, this field of social activity is turning into an isolated field, while on the other, attempts are being made to integrate an approach in which development concerns all the activities taking place in a given territory, and tourism – if the determinants of its development are diagnosed properly – can constitute one of those determinants (functions) of the development processes. However, practical application of the principle of sustainable development in tourism presents many challenges (Zegar, 2002, Czyzewski, Czyzewski 2013), for which there are two reasons. Firstly, the reception areas differ from each other in terms of the characteristics of the environment and the degree of development of tourism phenomena. Secondly, the nature of tourism's impact in tourist regions is usually complex and overlaps with internal social and economic issues which are difficult to eliminate in the short term. A clearly defined way of implementing these principles and the criteria for measuring its effects is also lacking.

Market determinants of tourism development

As an independent science involving economic processes in the area of production, distribution,

exchange, and consumption of the means of satisfying human needs, economics deals with people's economic activity. It specifies the possibilities of using resources at their disposal, which are nearly always limited, by individuals and societies. And so it also deals with the issue of the tourist resources necessary for the development of tourism.

As a sphere of consumption and production of goods and services, tourism develops within certain structures of the international economy, which means it is possible to examine it from the mega-economic perspective as an element of global management processes. It has become a powerful tool of globalisation processes, which results both from the reasons for the occurrence of this phenomenon and its effects (Nawrocka, Oparka, 2007). From the macroeconomic point of view, the position of tourism is connected with the contribution of the tourism sector to GDP and with the rate of employment in the tourism sector. Thus, the position of tourism as a field in the entire national economy of a given country is highlighted, at the same time taking into consideration the uniform rules of functioning in the market in the European Union (Panasiuk, 2006).

There is, however, a need to examine the individual fields of the economic process theoretically and in the form of a review – from the meso-economic perspective (Lazarek, 2001). This is done, from the sectoral point of view, by branches of detailed economics, within which functional economics, including the economics of tourism, can be distinguished.

Hence the economics of tourism is an interdisciplinary science on account of the complexity of tourism as a socioeconomic phenomenon. It deals with tourism-related needs, goods and services, and the tourism product. It studies the regularity of price changes in the tourism market, demand, supply, and tourism rent, as well as the share of tourism in the economy and the links and relationships with

the generation and distribution of gross domestic product (Lazarek, 2002). The economics of tourism acts as a kind of catalyst, combining theory with practice and practice with theory. It makes it possible to make assessments, but also forecasts processes occurring in the tourism economy (local, regional, national or international). The close links between the economics of tourism and other functional economics (subeconomics) cause their detailed development (the microeconomic level). This division can be related to individual elements of the tourism market. And so we distinguish between: the economics of the hotel industry, the catering industry or tourism and hospitality management. Individual functional economics correspond to tourism submarkets. Analysing the processes taking place in these markets, one may formulate certain regularities and generalisations relevant to each area of research. Studies in tourism economics focus primarily on the position of tourism in the national economy, issues connected with the tourism economy, the tourism market, the tourism policy, regional aspects of tourism development, and international tourism.

Tourism may be one of the aims of economic activity and one of the means of boosting an economy. As a sector of the national economy – in spite of the spatial diversification of activity – it is linked to almost all of its branches, it supports, even stimulates a country's economic growth. It is also a sector of the economy characterised by high labour intensity. Apart from its direct impact on the economy, it is the indirect effects resulting from activating branches not directly connected with tourism that are important, and this part of the share of GDP and employment which would not exist if it were not for the link between these branches and tourism. Thus, for many regions, the tourism economy is becoming an important factor of development, and its share in Poland has remained at quite a sustainable level of 5-6 % of GDP for many years

now. The developing tourism industry¹ in Europe directly generates more than 5 % of Europe's GDP. About 1.8 million companies in this sector employ nearly 9.7 million people, which constitutes almost 5.2 % of the total number of people employed in all of the European countries. The countries with the largest share of income from tourism in GDP are primarily island countries and islands which are dependent territories. Their economies are described as tourism-oriented monofunctional economies, i.e. strictly economically dependent on foreign tourist traffic.

In accordance with the principles of classical economics, the basic and most effective mechanism regulating the functioning of the economy is the market. In the case of the tourism market, determining its scope is connected with the adopted definition of the phenomenon of tourism. In subjective terms, the tourism market is made up of: tourism demand, tourism supply, price, and the terms of sale of tourism offers.

The entities creating demand reveal their tourism-related needs. The need to satisfy these needs triggers processes adapting the activity of entities in the sphere of supply of tourism-related goods and services to the tourists' expectations. The diversity of goods and services purchased in connection with travel, the nature of tourism consumption, affects the need to define tourism demand separately (Dziedzic, Skalska, 2012). According to Hunziker and Krapf (1942), tourism demand is the tourists' readiness to purchase specific numbers of tourism-related goods for a specific amount of money. The regularities concerning tourism demand examined in the economic categories will be of a different nature

than the demand for tangible goods. This results primarily from the fact that the subject of consumption, i.e. the tourism product, consists of devices and services, and its structure is determined by factors which are not measurable (subjective assessment of the product by the consumer). The complexity of the tourism product points to its unique nature (Wiatrak, 1998), i.e. intangibility, impermanence, and uniqueness, among others. The consumption of the tourism product cannot be delayed in time. Here, just like in the case of other services, production and consumption occur simultaneously. Wanting to stay on the market, travel agencies offer a wide array of products, constantly monitor customers' expectations and measure the level of their satisfaction. The battle for customers with the use of prices turns out to be unprofitable in the long term (Balinska, 2009). This draws attention to the need for coordination and cooperation, i.e. management of all the activities in the place of tourist reception in order to achieve the desired quality of the product offered (Rapacz, 2003). It is important to introduce innovative solutions by creating original, unique tourism products from scratch, as well as a professional marketing environment for the natural and cultural qualities of a given area (Krzyzanowska, 2014). This is why the megafactors shaping tourism demand are people's needs on the one hand, and on the other, the possibilities of satisfying them, expressed both through consumer purchasing power and the development of supply. The mutual dependence of demand and supply as variables which determine each other is worth noting here. Needs constitute the driving force behind the development of supply, the aim of which is their satisfaction. On the other hand, the size of demand is also a derivative of the size and structure of supply, because without its existence, demand would not be stimulated. A gap in demand (unmet demand) appears, which constitutes the difference between the effective

¹ A discussion on the interpretation and scope of the tourism economy and tourism industry has been present in the Polish literature on the economic issues of tourism for many years now. With reference to the tourism economy, Gaworecki's definition (2003, p. 161) is usually cited. According to him, the tourism economy is a set of various economic and social functions developed directly or indirectly in order to satisfy people's growing demand for tourism-related goods and services. Bosiacki (Bosiacki 1994) uses both terms interchangeably, treating them as synonyms. Alejziak (Alejziak 1999) uses the term "tourism industry". Both terms are collective terms, which include both the tangible goods production sectors and the sphere of services.

demand and potential demand (Dziedzic, Skalska 2012). The distinctive characteristics of demand, i.e. complementarity, substitutability, heterogeneity, and mobility, among others, point to its diversification. The occurrence of demand for various products on the market which are mutually complementary and/or substitutable, determined by their prices can therefore be perceived. This phenomenon hinders (often prevents) analysis of the factors affecting the size of demand due to the fact that the purchase of individual partial services can be subject to the impact of other factors, sometimes contradictory, characterised by opposing effects (e.g. a decrease in the prices of hotel services with a simultaneous increase in the costs of transport) (Sinclair, Stabler 1998). Combining individual products into packages and examining the factors of their impact becomes problematic. In an economic analysis, the assessment of the response of demand to individual elements of tourism packages, changes in economic factors (e.g. price and/or income) in particular, becomes debatable.

In market conditions, balance is established between demand and supply, identified by the intensity of tourist traffic. This aspect also usually constitutes the basic scope of activity of the tourism policy, i.e. the state's impact on inbound tourism. The need to implement tourism policies – both on the level of individual countries and regions, and on an international scale – results from the fact that the development of tourism carries with it many consequences, both positive and negative (Alejziak, 2003). Entities responsible for these policies may use a number of tools of an economic, legal, and organisational and administrative nature. They usually affect both tourism demand and supply (through mutual stimulation), hence the difficulty in separating one from the other (Wodejko, 1998). Tourism policy is quite a complicated process of controlling development, in which the coordination of the activity of various institutions

active in different sectors of the economy is particularly important. The function of the coordinator of all the sectors affecting the development of tourism is performed by the state, which – as part of the policy it implements – has to take into account not only the multiple functions of tourism and the interests of various entities of the tourism market, but also the fact that it is currently an important element of international relations (Alejziak, 2000). Irrespective of the effects of the economisation of tourism, a remark on the influence of the theories and schools existing outside the so-called economics of the main trend in studies on tourism and the fundamental directions of these studies, becomes essential.

Conclusions

- 1) Today, tourism has become a powerful tool of the globalization process, both in terms of causes and effects of this process.
- 2) The basic premise of the economization of tourism is that it is a catalyst combining theory with practice and practice theory.
- 3) The specificity of tourism consumption requires a separate definition of tourism demand and supply of tourism products, which determines, through price elasticity of tourist services.
- 4) Tourism policy must take into account the state of the current market imbalances resulting due to tourists' caused specific needs, which reflect on the demand and supply-side.
- 5) Indispensable impact on the economization of tourism is caused by the development of theories and schools taking into account the economic impact of services on the development of the economy.
- 6) The new paradigms of economization of tourism arise owing to the economic impact of services on the development of global economy, which determines the need for revision of the former tourism basic postulates and research focuses.

Bibliography**Journal paper with author(s)**

1. Baldock, D. Hart, K. Scheele, M. (2014). Public Goods and Public Intervention in Agriculture, retrieved: www.enrd.ec.europa.eu, access: 10-09-2014.
2. Alejziak, W. (2003). Polityka turystyczna (Tourism Policy). R. Winiarski (ed.), Nauki o turystyce. Studia i Monografie AWF w Krakowie 2003, p. II, 7, pp. 40-94
3. Alejziak, W (2000). Turystyka w obliczu wyzwan XXI wieku (Tourism in the face of the challenges of the twenty-first century). FHU. Albis, Krakow.
4. Balinska, A. (2009). Struktura popytu turystycznego i czynniki kształtujące ten popyt (na podstawie wyników badań empirycznych) (The structure of tourism demand and factors affecting the demand (based on the results of empirical research). EIÖGZ, Warsaw, no. 74, pp. 137- 147.
5. Bartkowiak, R. (2010). Współczesne teorie ekonomiczne (Contemporary economic theories). Roczn. Nauk Roln., ser. G Ekonomika Rolnictwa, t. 97, z. 2, pp. 16-29.
6. Begg, D., S. Fischer, R. (2000). Dornbusch. Ekonomia. Mikroekonomia (Economy. Microeconomics). PWE, Warszawa.
7. Butowski, L. (2011). Turystyka jako dyscyplina naukowa (Tourism as a scientific discipline) Turyzm, 21/1-2.
8. Goeldner, C.R. Brent, J.R. (2006). *Tourism: Principles, Practices, Philosophies*. Hoboken, N.J: John Wiley & Son.
9. Christaller, W. (1933). *Die Zentralen Orte In Suddeutschland. Eine economisch-geographische Untersuchung uber die Gesetzmassigkeit der Verbreitung Und Entwicklung der Siedlungen mit stadtischen Funktionen*. Gustav Fischer Verlag, Jena.
10. Christaller, W. (1963). *Some considerations of Tourism location in Europe: the peripheral regions – under-developed countries – recreation areas*. Regional Science Association Papers no. 12.
11. Cooper C., J. Fletcher, A. Fyall, D. Gilbert, S. (2003). Wanhill: *Tourism Principles and Practices*, Oxford.
12. Cooper, J. (2005). *Global Agriculture Policy and Trade, Environmental Gains and Losses*. Edward Elgar, Cheltenham, UK – Northampton MA – USA.
13. Czyzewski, A., Brelik, A. (2017). *Economization of Tourism as a Research Problem*, Warsaw.
14. Czyzewski, A., Czyzewski, B. (2014). A New Paradigm of Development as a Modern Challenge in Agriculture. "Management" vol. 18 (1).
15. Domanski, R. (2002). *Gospodarka przestrzenna* (Spatial economy). Wydawnictwo Naukowe PWN, Warszawa.
16. Domanski, R. (1989). *Podstawy planowania przestrzennego* (Fundamentals of planning). PWN, Warszawa.
17. Dwyer, L., P. Forsyth, Dwyer, W. (2010). *Tourism Economics and Policy*, Channel View Publications, Bristol UK.
18. Dziedzic, E., Skalska, T. (2012). *Ekonomiczne uwarunkowania rozwoju usług turystycznych w Polsce* (Economic conditions of development of tourist services in Poland), Warszawa.
19. Golembki, G. (2003). Turystyka jako czynnik integrujący badania naukowe (Tourism as a factor integrating scientific research) In: G. Golembki (ed.), *Kierunki rozwoju badań naukowych w turystyce*. Wyd. Nauk. PWN, Warszawa.
20. Hunziker, W., Krapf, K. (1942). *Grundriss der allgemensinen Fremdenverkehrslehre*. Polygraphischer Verlag, Zurich 1942.
21. Kachniewska, M. (2011). Funkcja turystyczna jako determinant jakości życia na wsi (The function Tourist as a determinant of the quality of life in rural areas). *Folia Pomer. Univ. Technol. Stetin. Oecon.* 288 (64), Szczecin.
22. Kozak, M. (2008). *Koncepcje rozwoju turystyki (concepts of Tourism development)*. "Studia Regionalne i Lokalne" no. 1 (31).
23. Krzyzanowska, K. (2009). *Innowacyjność w turystyce wiejskiej – teoria i praktyka (Innovation in rural tourism - theory and practice)*. *Innowacje w rozwoju turystyki*, ed. K. Nuskiewicz, M. Roman, 13. Goładkowo: Wydawnictwo Zespołu Szkół Centrum Kształcenia Rolniczego, 2014 A. Balinska: *Struktura popytu turystycznego i czynniki kształtujące ten popyt (na podstawie wyników badań empirycznych)*, EIÖGZ, Warszawa 2009, no. 74.
24. Kurek, W. (2011). *Turystyka (Tourism)*. Wyd. Nauk. PWN, Warszawa.
25. Lazarek, R. (2001). *Ekonomika turystyki (Economics of Tourism)*, Warszawa.
26. Nawrocka E., Oparka, S. (2007). *Hotel w XXI wieku (Hotel in the XXI century)*. *Zarządzanie w warunkach globalizacji, Edukacja*, Wrocław.
27. Nawrocka, E. (2010). *Kierunki rozwoju gospodarki turystycznej w Polsce w świetle współczesnych teorii wzrostu gospodarczego i rozwoju (Directions of development of tourism in Poland in the light of contemporary theories of economic growth and development)*. ZNUS, 627, *Ekonomiczne Problemy turystyki*, 16, Szczecin.
28. Nir, D. (1990). *Regions as a Socio-environmental System: An Introduction to a Systemic Regional Geography*, Kluwer Academic Publishers, Dordrecht, p. 95, as cited in: Z. Chojnicki, *Region...*, op. cit., p. 13.
29. Panasiuk, A. (2006). *Ekonomika turystyki, (Economics of Tourism)*. Warszawa.
30. Rapacz, A. (2003). *Współpraca regionalna i transgraniczna czynnikiem kształtowania jakości produktu turystycznego (Regional cooperation and cross-border factor in shaping the quality of the tourist product)*. *Kierunki rozwoju badań naukowych w turystyce*, ed. G. Golembki, Wydawnictwo Naukowe PWN, Warszawa.
31. Sinclair, T., Stabler M. (1998). *The Economics of Tourism*. Ed. Routledge, London, New York.
32. Stabler, M.J., Papatheodorou, A., Sinclair, M. (2010). *The Economics of Tourism*, second edition, Routledge, Abingdon, UK.
33. Tribe, J. (2011). *The Economics of Recreation, Leisure & Tourism*, Butterworth-Heinemann, Oxford UK.

34. Tribe, J., Xiao, H. (2011). *Developments in Tourism Social Science*, "Annals of Tourism Research", 38 (1).
35. Wiatrak, A.P. (1998). Rynek i produkt w turystyce wiejskiej (Market and product in rural tourism.). A. P. Wiatrak (ed.). Marketing i produkty markowe w turystyce wiejskiej, Konferencja Naukowa, 5.11.1998. SGGW w Warszawie, Warszawa.
36. Wodejko, S. (1989). Ekonomiczne zagadnienia turystyki (Economic tourism issues), Wyższa Szkoła Handlu i Prawa w Warszawie, Warszawa 1998.
37. Zegar, J.S. (2007). Społeczne aspekty zrównoważonego rozwoju rolnictwa (Social aspects of sustainable development of agriculture). "Fragmenta Agronomica" no. 4 (96).

CROSS-BORDER CONTACTS AND COOPERATION BETWEEN POPULATION OF LATVIA, ESTONIA AND RUSSIA: A CASE OF ALUKSNE REGION

Santa Daume¹, Mg.sc.soc; Aija Zobena², Dr.sc.soc., professor

^{1, 2} University of Latvia

Abstract. The main focus of this paper is on cross-border contacts and cooperation within Latvia – Estonia – Russia border area from the perspective of population of Aluksne region in Latvia. Aim of this research paper is to make conclusions about local populations' of Aluksne region closeness of contacts with cross-border population. It is achieved by analysing inhabitants' cross-border mobility and processes related to that. To make empirical results, survey with 200 inhabitants of Aluksne region was conducted in December 2016. Main findings point out the role of mobility and cross-border contacts in forming social reality of an individual, describe differences between frequency and reasons of border crossing of Estonia and Russia, as well as confirm the role of place of residence in the border area as an important factor for border crossing.

Key words: cross-border contacts, cross-border cooperation, cross-border mobility, Latvia-Estonia-Russia border area, Aluksne region.

JEL code: R58

Introduction

A variety of sociological theories and territories development approaches include in their analysis such theoretical and practical social concepts, associal networks, social interaction, experience exchange, social learning, social capital and other related to maintaining contacts and forming cooperation at individual, groups or institutional level. This leads to think that social contacts is one of the key concepts, which can promote explanation of more complex social processes, including the ones related to cross-border mobility and cooperation.

Because of open borders policy of the European Union (EU) and other global processes, a lot of authors analyse labour mobility (Williams A. M., Balaz V., & Wallace C., 2004; Andrijasevic R., Sacchetto D., 2016; Hardy J., Calveley M., & Kubisa J., 2015; Hardy J., 2015; Oettl A., Agrawal A, 2008), which is related to several economic factors – employment, salary, appropriate work position etc. However, mobility is a complex process with a lot of possible dimensions and forms of expression (Williams A. M., 2009). Border crossing can be related to a variety of reasons if living in a border area – to entertainment, cognitive (for example, sightseeing, exploring new cultures etc.) or functional (for example, shopping, receiving services, employment, education etc.) reasons.

The aim of this research paper is to make conclusions about local populations' of Aluksne region closeness of contacts with cross-border population. It will be achieved by analysing inhabitants' cross-border mobility and processes related to that.

Population of Aluksne region in Latvia, which directly borders with both – Estonia (the EU internal border) and Russia (the EU external border) was chosen as a case for this study. Accordingly, the following hypotheses were raised.

- H1: Population of Aluksne region has more frequent contacts and cooperation with Estonia and its population than with Russia and its population.
- H2: Population of Aluksne region has more frequent superficial contacts than intentional cooperation with population of Estonia.
- H3: Population of Aluksne region has more frequent superficial contacts than intentional cooperation with population of Russia.

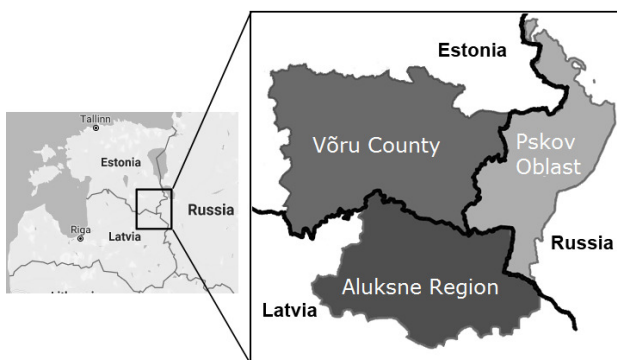
Two types of social contacts can be found when talking about cross-border mobility – first, contacts which are being formed because of mobility or during it as a result; second, contacts which are pre-existing and may lead to decide in favour of mobility. Within frame of this research paper, we define social contacts and cooperation based on their closeness: (a) superficial contacts without personal, close communication (randomly

met individuals in public places, because of visiting other country etc.) and (b) intentional contacts with purposeful cooperation and with maintaining social ties (cooperation projects, fellowship, friendship, kinship etc.).

Research results and discussion

1) The Case Study

In this article we analyse cross-border mobility, existence of cross-border social contacts and cooperation of population of Aluksne region in Latvia. The region borders directly with Estonia (the EU internal border) and with Russia (the EU external border) (Fig. 1), it has an area of 1698 km². Based on the data of Central Statistical Bureau of Latvia, population of 15 381 was registered in Aluksne region in 2016. Population of the region has decreased for more than seven thousand people from 1990, and population is still decreasing for 300 to 500 hundred people each year starting from 2010 (Central Statistical Bureau of Latvia, 2016). The region is located in a peripheral territory of the country around 200 km from the capital city of Latvia. These characteristics make Aluksne region as one of the typical cases of rural regions of Latvia nowadays. Within context of regional development, this context encourages to reconsider and analyse resources and options of potential development of the region. Mobility of population can be considered as one of forms of cooperation, thereby it cannot be ignored when looking for potential options of development of the region.



Source: author's created image.

Fig. 1. Studied area

To make conclusions about closeness of cross-border contacts and frequency of cooperation, a

survey with population of Aluksne region was conducted in December 2016. In total, 200 fully completed questionnaires were obtained using online and F2F interviewing. The sample is not representative, however, all age groups are represented starting from 15 years old – 31 % of respondents aged 15 to 34, 38 % - aged 35 to 54, 31 % - 55 years old or older. The sample consists of 81 % female and 19 % male, 93 % are of the Latvian nationality, 7 % - other (mostly Russian) nationalities. In the sample, the whole territory of Aluksne region, including Aluksne city (53 %) and all 15 parishes forming the region, is represented.

2) Cross-border Mobility, Contacts and Cooperation

Over the past decade, mobility studies in social sciences have shaped a new paradigm because of an interdisciplinary approach. The new field of studies includes research on geographical mobility of humans, non-humans and objects, flows of exchange of information and capital, infrastructure and other physical means for travelling and communication. The new interdisciplinary approach combines deeply sociological concepts and field of interest with concerns of research of geographers, anthropologists and communication scientists (Sheller M., 2014).

When analysing cross-border mobility, it is possible to discuss population flows across the border as a physical movement to another country, yet formation and existence of social ties, which can be both the cause as well as consequences of cross-border mobility, cannot be ignored. International mobility not only helps improve financial situation of the individual and makes profit, but it also has an important role in transferring knowledge and skills. This process can include complex routes, regular or circular migration as well as short-term migration (King R., 2002).

International mobility of inhabitants differs from other "factor mobilities" mainly because of

its socially and culturally constructed nature (Williams A. M., 2009). One of the ideas of social constructivism expresses a statement that social environment has an important role in creating knowledge because an individual creates his or her knowledge within social and cultural context (Berger T., Luckmann P., 1991; Talja S., Kimmo T., & Reijo S., 2005; Sporane B., 2010). Within this context, cross-border mobility helps to form unique social reality, which is influenced by social environment and culture of another country across the border.

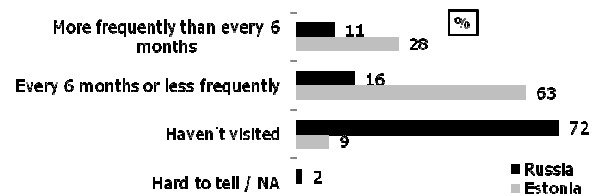
Cultural and social changes of nowadays Europe prove that mobility has an important role in everyday life of Europeans (Guereno-Omil B., Hannam K. & Alzua-Sorzabal A., 2014). Together with open border policy in the EU inhabitants' mobility has been promoted. Its aim is to transform borders of national states "from barriers into places of communication" (Prokkola E. K., 2007). However, professor of politics and international relations Chris Rumford points out that influence of borders on inhabitants of Europe is not clear (Rumford C., 2006).

To examine hypotheses of the research paper, we analyse both types of social contacts – superficial as well as intentional contacts and cooperation with inhabitants of Estonia and Russia. In addition, we analyse the most frequent destinations of inhabitants, when visiting Estonia and Russia, to examine cross-border migration flows of inhabitants.

3) Findings of Empirical Research in Aluksne Region

Survey data show that respondents visit Estonia significantly more frequently than Russia – 72 % of all respondents have not visited Russia at all during the last three years, while only 9 % haven't visited Estonia during the same time (Fig. 2). If talking about regularity of visiting cross-border countries – respondents with more frequent regularity visit Estonia than Russia – almost one third (28 %) of respondents, who have visited Estonia at least once a year within

last three years, have done it more often than once in 6 months (at least twice in 6 months). For comparison – only 11 % of respondents, who have visited Russia at least once a year within last three years, have visited Russia more often than once in 6 months. One of the main reasons of such differences is related to different EU internal and external borders policy, when inhabitants can freely cross Estonia's border, but special permission or visa is required to cross Russia's border. Our research leads to think that the EU internal border between Latvia and Estonia promotes international mobility between both countries.



n=200. Single answer question.

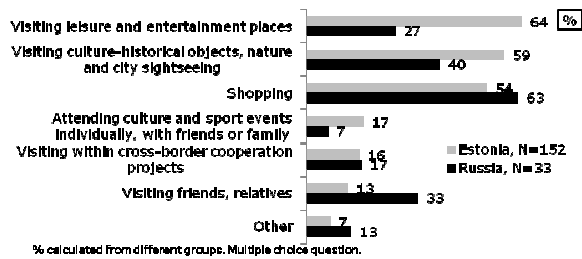
Source: author's calculations based on data of survey of inhabitants of Aluksne region.

Fig. 2. On average, how often have you visited Estonia / Russia within the last three years?

The main reasons to visit Estonia and Russia differ. Respondents visit Estonia to mostly attend leisure and entertainment places (64 %), while they visit Russia to mostly do shopping (63 %) (Fig. 3). Thereby, border crossing is also related to economic benefits – purchasing cheaper things closer to home. Most frequently inhabitants of Aluksne region purchase cheaper gas, alcohol, cigarettes and a variety of groceries in Estonia or Russia (Daume S., 2014).

It is important to note that for one third (33 %) of respondents, who visit Russia at least once a year, one of the main reasons to do that is because of visiting relatives or friends (Fig. 3). One of explanations of that can be found in more subtle breakdown by parishes of Aluksne region – majority of respondents, who visit Russia to meet relatives or friends, live in Pededze parish – it has a direct border with Russia and ~80 % of its population are Russians by ethnicity. Exactly population of this parish has the most frequent

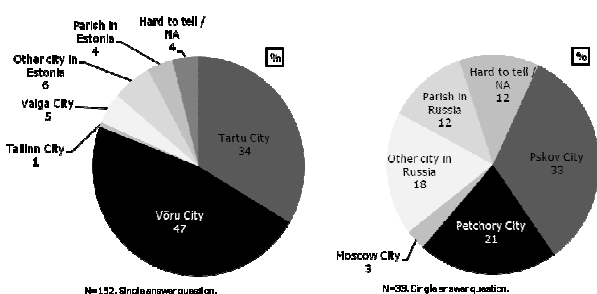
social ties with inhabitants of Russia both in terms of personal communication as well as with cross-border cooperation related projects (Daume S., 2014).



Source: author's calculations based on data of survey of inhabitants of Aluksne region.

Fig. 3. What are your most frequent reasons for visiting Estonia / Russia?

The most frequent destination of respondents in Estonia is the centre of neighbour Voru county – Voru City (47 %), which is located ~65 km from Aluksne city, the centre of Aluksne region. Voru city is the nearest Estonian city to Aluksne region. The second most frequently visited Estonian city is Tartu (34 %) –the second biggest city of Estonia, which is located ~140 km from Aluksne city. While the most frequent destination of respondents in Russia is Pskov city (33 %) – the centre of Pskov oblast located ~103 km from Aluksne city. In second place – Petchory city (21 %), which is located ~71 km from Aluksne city. It is important to note that regardless of the country, most frequently respondents visit the nearest local or national cities – which leads to an assumption that a distance from the border has an impact on choice of visiting border countries.

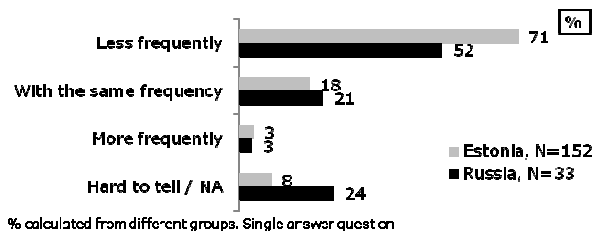


Source: author's calculations based on data of survey of inhabitants of Aluksne region.

Fig. 4. Which city / parish of Estonia / Russia do you visit most often?

Most part of respondents, who had visited both Estonia and/or Russia at least once a year

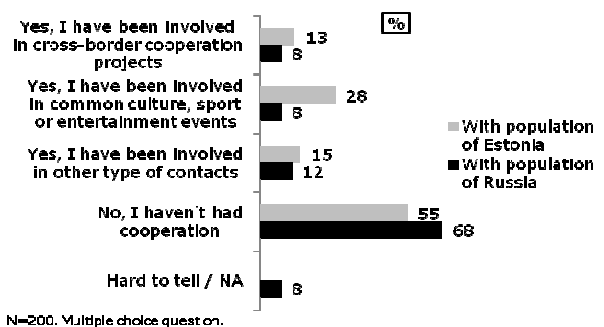
within last three years, answered negatively to the question: „In your opinion, would you visit Estonia / Russia with the same frequency if your place of residence was not in its border area?“ Accordingly, definitely or rather they'd visit a neighbour country less often (Fig. 5). Greater distance, longer time spent for driving and increase of means necessary in both cases were mentioned as main reasons for less often visits. Based on this data, we can confirm that the place of residence in border area influences the regularity of visiting neighbour countries.



Source: author's calculations based on data of survey of inhabitants of Aluksne region.

Fig. 5. In your opinion, would you visit Estonia / Russia with the same frequency if your place of residence was not in its border area?

Majority of respondents have not been involved in cooperation or intentional contacts with inhabitants of Estonia (55 %), nor with inhabitants of Russia (68 %) (Fig. 6).

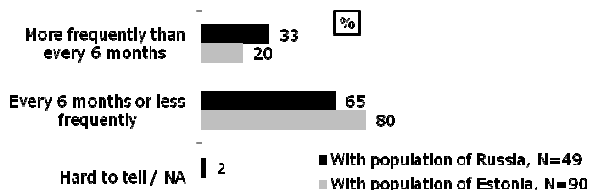


Source: author's calculations based on data of survey of inhabitants of Aluksne region.

Fig. 6. Have you been involved in any type of contacts with inhabitants of Estonia / Russia within the last three years?

If comparing results between visiting Estonia or Russia and cooperation with inhabitants of Estonia or Russia, authors conclude that respondents significantly more frequently have visited Estonia than they have had cooperation with inhabitants of Estonia. While regarding

Russia – frequency of visiting and cooperation is similar (26 % have visited Russia and 24 % have had cooperation). Even more interesting is the fact that respondents, who have had cooperation with inhabitants of Russia, have had it with more frequent regularity than those, who have had cooperation with inhabitants of Estonia (Fig. 7). Here also one of explanations could be different reasons of visiting each country.



% calculated from different groups. Single answer question.
Source: author's calculations based on data of survey of inhabitants of Aluksne region.

Fig. 7. On average, how often have you cooperated with inhabitants of Estonia/ Russia within the last three years?

Significantly more frequently respondents have been involved in common culture, sport or entertainment events with inhabitants of Estonia (28 %) than with inhabitants of Russia (8 %). A negligible proportion of respondents have been involved in cross-border cooperation projects – 13 % of all respondents have been involved in cross-border cooperation projects with inhabitants of Estonia, 8 % - with inhabitants of Russia (Fig. 6). Regarding other type of contacts, most frequently respondents mentioned communication and meetings with relatives and friends or on business purposes. Survey data did not reveal cooperation regarding receiving services (for example, medical services or education).

Conclusions

1) The role of cross-border contacts in forming social reality of the individual can be determined based on theoretical ideas of social constructivism and mobility. It can take a form of direct impact on the individuals' life (for example, easing everyday life, improving financial situation, doing shopping etc.) or

of indirect impact (for example, forming view of life through gaining knowledge and experience about another culture etc.). Empirically deeper analysis would be required to identify specific fields of life, how and where this impact takes place in everyday life. However, analysis of cross-border mobility and closeness of contacts allows us to make primary assumptions and conclusions about the studied area, cross-border flows, reasons and regularity. This can be considered as a pre-condition or basis of cross-border mobility's influence on forming social reality of the individual.

- 2) More frequently respondents have visited Estonia than Russia, as well as they have done it with more frequent regularity during the last three years. In general, they have also had more frequent cooperation with inhabitants of Estonia (cross-border projects, common culture, sport and other events or other occasions) than with inhabitants of Russia. We can conclude that the first hypothesis – population of Aluksne region has more frequent contacts and cooperation with Estonia and its population than with Russia and its population – has been proved.
- 3) Majority (91 %) of respondents have visited Estonia at least once during the last three years, while less than a half (45 %) of them have been involved in cooperation or intentional contacts with inhabitants of Estonia. We can conclude that the second hypothesis – population of Aluksne region has more frequent superficial contacts than intentional cooperation with population of Estonia – has also been proved.
- 4) Regarding closeness of contacts and cooperation with inhabitants of Russia – they are rather rare. Both frequency of visiting and frequency of cooperation are similar – only 27 % have visited Russia and only 28 % have been involved in cooperation or intentional contacts with population of Russia during the

last three years. Based on the results of this study, the third hypothesis – population of Aluksne region has more frequent superficial contacts than intentional cooperation with population of Russia – has not been proved. Nevertheless, authors conclude that a larger sample size would be required to make more persuasive conclusions.

- 5) Authors conclude that the place of residence in the border area is an important factor to visit cross-border countries. Mobility cannot be analysed only as geographical movements, but it is also important to be aware of its social aspect – mobility forms and promotes social and culture interaction, thereby either directly or indirectly affects inhabitants and their social world. Consequently, a location place in the border area can be considered as a specific factor within context of territories' development.

- 6) In the further work, authors recommend analysing the nature of cross-border contacts more in detail – for example, spread of personal contacts versus contacts of organizations or groups and its correlation with frequency of border crossing. As well as empirical study of Voru county in Estonia and Petchory region in Russia could be carried out to obtain a comprehensive picture of cross-border contacts and cooperation within Latvia-Estonia-Russia border area, not only from perspective of Latvia's side of the border, but also from perspective of the rest of two other countries.

Acknowledgements

This paper was funded by LU research project "public health, quality of life and sustainable nation" (lu reg.nr. zd2016/az117).

Bibliography

- Andrijasevic, R., Sacchetto, D. (2016). *From Labour Migration to Labour Mobility? The Return of the Multinational Worker in Europe*. Transfer, Vol. 22(2), pp.219–231. Retrieved: <http://journals.sagepub.com/doi/pdf/10.1177/1024258916635975>. Access: 12.01.2017.
- Berger, P., L., Luckamnn, T. (1991). *The Social Construction of Reality*. London: Penguin Books, p.249.
- Central Statistical Bureau of Latvia. (2016). *ISG01.Area, Population Density and Resident Population by Statistical Region, City and County*. Retrieved: http://data.csb.gov.lv/pxweb/en/Sociala/Sociala__ikgad__iedz__iedzskaits/IS0010.px/table/tableViewLayout2/?rxid=cdbc978c-22b0-416a-aacc-aa650d3e2ce0. Access: 05.01.2017.
- Daume, S. (2014). *Malenijas jauniešu interese par novada kultūru (Young Malenians Interest About Culture of the Region)*. Rīga: Latvijas Zinatnu akadēmijas Vestis, Part A, No.3/4, pp.41.–60. Retrieved: [http://www.lza.lv/LZA_VestisA/68_3-4/3_Santa %20Daume %20Malenijas %20jauniešu %20interese.pdf](http://www.lza.lv/LZA_VestisA/68_3-4/3_Santa%20Daume%20Malenijas%20jauniešu%20interese.pdf). Access: 05.01.2017.
- Guereno-Omil, B., Hannam, K. & Alzua-Sorzabal, A. (2014). *Cross-border Leisure Mobility Styles in the Basque Eurocity*. Leisure Studies, 33:6, pp.547-564. Retrieved: <http://dx.doi.org/10.1080/02614367.2013.833282>. Access: 09.01.2017.
- Hardy, J., Calveley, M., & Kubisa, J. (2015). *Labour Strategies, Cross-border Solidarity and the Mobility of Health Workers: Evidence from five New Member States*. European Journal of Industrial Relations, Vol. 21(4), pp.315–333. Retrieved: <http://journals.sagepub.com/doi/pdf/10.1177/0959680114553159>. Access: 12.01.2017.
- Hardy, J. (2015). *Explaining 'varieties of solidarity': labour mobility and trade unions in an enlarged Europe*. Transfer, Vol. 21(2), pp.187–200. Retrieved: <http://journals.sagepub.com.ezproxy.utlib.ut.ee/doi/pdf/10.1177/1024258915573186>. Access: 12.01.2017.
- King, R. (2002). *Towards a New Map of European Migration*. International Journal of Population Geography 8 (2): 89–106. Retrieved: <http://onlinelibrary.wiley.com/doi/10.1002/ijpg.246/pdf>. Access: 12.01.2017.
- Oetli, A., Agrawal, A. (2008). *International Labor Mobility and Knowledge Flow Externalities*. Journal of International Business Studies, Vol. 39, No. 8, pp.1242-1260, Retrieved: <http://www.jstor.org/stable/25483344>. Access: 12.01.2017.
- Prokkola, E. K. (2007). Cross-border Regionalization and Tourism Development at the Swedish-Finnish border: "Destination Arctic Circle". *Scandinavian Journal of Hospitality and Tourism*, Vol.7, Issue 2, pp.120–138.
- Rumford, C. (2006). *Theorising borders*. European Journal of Social Theory, 9 (2), pp.155–169. Retrieved: <http://journals.sagepub.com/doi/pdf/10.1177/1368431006063330>. Access: 12.01.2017.
- Sheller, M. (2014). *The New Mobilities Paradigm for a Live Sociology*. Current Sociology Review 2014, Vol. 62(6), pp.789–811. Retrieved: <http://journals.sagepub.com.ezproxy.utlib.ut.ee/doi/pdf/10.1177/0011392114533211>. Access: 12.01.2017.
- Sporane, B. (2010). *Nacionāla identitāte & komunikācija*. Manuskripti: Nacionāla identitāte un atmiņas institūcijas (National Identity & Communication. Working Papers. National Identity and Memory Institutions). Valsts pētījumu

programma "Nacionālā identitāte", p.29. Retrieved: http://identitate.lnb.lv/wp-content/uploads/2010/12/Working-papers_sporane.pdf. Access: 12.01.2017.

14. Talja, S., Kimmo, T., & Reijo, S. (2005). *"Isms" in information science: constructivism, collectivism and constructionism*. Journal of Documentation. Vol. 61, No. 1, p. 82. Retrieved: <http://www.emeraldinsight.com/journals.htm?issn=0022-0418&volume=61&issue=1>. Access: 11.01.2017.
15. Williams A. M. (2009). *International Migration, Uneven Regional Development and Polarization*. European Urban and Regional Studies, 16(3), pp.309–322. Retrieved: <http://journals.sagepub.com/doi/abs/10.1177/0969776409104695>. Access: 11.01.2017.
16. Williams, A. M., Balaz, V., & Wallace, C. (2004). *International Labour Mobility and Uneven Regional Development in Europe: Human Capital, Knowledge and Entrepreneurship*. European Urban and Regional Studies, 11(1), pp.27–46. Retrieved: <http://journals.sagepub.com/doi/pdf/10.1177/0969776404039140>. Access: 12.01.2017.

ASSESSMENT OF SPA HOTEL SERVICES' DEVELOPMENT OPPORTUNITIES IN REZEKNE CITY

Iveta Dembovska¹, Mg.oec./ Lecturer; Lienite Litavniece², Dr.oec./ Assistant Prof.,
Senior researcher; Inese Silicka³, Mg.oec./ Lecturer

^{1, 2, 3} Rezekne Academy of Technologies

Abstract. SPA hotel development is an important recreational and accommodation service for which demand is increasing. The article is the result of RTA scientific grant research "Assessment of hotel services development opportunities in Rezekne city". Aim of the study was to investigate and assessment of the SPA hotel service development opportunities in Rezekne. The paper examines the historical development of the SPA and the theoretical aspects of SPA services. Special attention is devoted to development opportunities of SPA hotel in Rezekne. Research examines results of the survey of Latgale inhabitants' attitude to potential use of the services of SPA hotel. The methods applied: scientific induction and deduction, graphic, synthesis and analysis, monographic, survey. According theoretical research Rezekne necessary to organize the division of SPA-SPA hotel.

Keywords: SPA hotel, city development, tourism, SPA product development.

JEL code: M31, L83, O18, R19, Z32

Introduction

The SPA industry in Europe has a long tradition, where people usually visited SPA hotels in order to receive medical services.

Topicality of the subject is determined by the fact that hotel owners and managers have dawned it is possible to use the SPA industry opportunities more thus creating additional income. As a result, a number of SPA hotels and resorts, focusing on SPA treatment, have increased significantly. In 2012, the global wellness tourism industry was worth 438.6 billion U.S. dollars (Global market size..., 2016). European SPA traditions have to face fierce competition, because Asian companies constitute a large competition in the SPA hotel and resort market.

The study (VIAA study..., 2015) by the State Education Development Agency confirms that the demand for the SPA services is increasing, which means that competition between the service providers becomes tougher. The study mentions that the SPA industry is largely focused on the physical well-being improvement services, including massage, SPA etc. relaxing and medical treatment procedures. Many researchers, for example, Yaman, R., Alias, Z., Ishak, N. (Yaman, R., Alias, Z., Ishak, N., 2012), Monteson, P., Singer, J. (Monteson, P., Singer, J., 2002), Spilioti E., Vargiami M., Letsiou S.

(Spilioti E., Vargiami M., Letsiou S. et al., 2016) and others have studied classification, use and motivation of the SPA services and a range of offers in hotels and SPA centres.

Comparing data on the hotels and tourist accommodation between the cities in Latvia, it can be concluded that the smallest number of tourism accommodation (3) was indicated in Rezekne in the 1st quarter of 2016; a smaller number of rooms was offered in Valmiera, Jelgava and Jekabpils. Rezekne showed one of the lowest indicators also in the terms of an offered number of beds; less number of beds was only in Jelgava and Jekabpils. (*Viesnīcas un citas turistu mītnes...*, 2016). When defining **the problem**, the authors believe that any entrepreneur, providing services, is looking forward to a service demand. This means that customer's satisfaction with the particular service is very important. The main aim and objective of the entrepreneur is to satisfy the customers' needs and desires. In order to be able to meet those expectations, it needs to be found out what is important to the customer. The task is always faced with a big contradiction, because most people want to receive the services of the maximum high level and the maximum low price. When characterizing the service, one of the most critical aspects is the quality.

A survey of Latgale region inhabitants was carried out within the framework of the project to find out their views on the potential use of SPA services in the four-star hotel which is planned to be built in Rezekne.

Hypothesis: Rezekne city needs a new SPA hotel with a variety of the SPA services.

The methods applied: scientific induction and deduction, graphic, synthesis and analysis, monographic, survey.

The aim of the paper: to study and assess the SPA hotel services' development opportunities in Rezekne city.

The following **tasks** have been set to achieve the aim:

- 1) to study theoretical aspects of SPA services;
- 2) to analyse necessity of SPA hotel services in Rezekne city;
- 3) to draw conclusions and develop proposals.

Novelty of the study: market research on the necessity of the SPA hotel services in Rezekne has been carried out.

SPA means "Sanus per aquam" or "Health through water" in Latin (Yaman, R., Alias, Z., Ishak, N., 2012).

The concept is known from the Ancient Roman times, when hot springs and thermal baths were used for curing illnesses. There is also another explanation of SPA justifying that the term SPA has originated from a small and ever famous Belgian village named SPA, where a popular water resort was located, and where Roman soldiers had a rehabilitation treatment course after fights. Apart of a general relaxation, the waters of the village helped to recover quickly and heal injuries

In today's world, this legend has gained recognition from the moment when the term SPA began to be used in the beauty industry. The USA began actively to develop and offer a range of beauty and recovery equipment, operating with water elements (SPA pec noteikumiem, 2016).

For a long time, the SPA concept included resorts with maximum possibilities of treatment, prevention, and rehabilitation via different manipulations based on healing qualities of water (marine and mineral water as well as thermal springs). The most well-known SPAs were built at the French and Italian coastlines. (Yaman, R., Alias, Z., Ishak, N., 2012)

The history of the SPA culture lies in Asia where the cult of the unity and well-being of body, spirit, and mind has been honoured for centuries. Massages relax, herbal medicine cures, water treatment soothe and cleanse as well as the SPA philosophy helps to find the clarity of spirit and mind. The SPA characterizes the Oriental culture, is associated with nature, and remains peaceful in its existence (Kas tas ir SPA, 2016).

Research and discussion

The International SPA Association has defined the SPA as a place to indulge into well-being through a variety of professional services that encourage the renewal of mind, body, and spirit (ISPA's Definition of Spa..., 2016).

The word SPA involves in itself a range of businesses and services whose main purpose is to improve the well-being of people using different professional services (Thorsteinsdottir K., 2005).

Any set of treatment aimed at improvement of the physical and mental state of a human could be characterised as a SPA treatment. The good SPAs have their own idea, philosophy, and an individual concept for solving one and the same task differently.

Hydrotherapy is often the main offer of SPA and health resorts. Water is used both internally (drinking and breathing) and externally (swimming, therapeutic exercises in a pool) (European Spas Association..., 2016).

The International SPA Association (hereinafter - ISPA) has classified SPA in six categories depending on the services offered and

locations. In accordance with ISPA classification, SPA are divided (Primary members..., 2016): SPA club – the SPA services are included in the total package of fitness offer; Day SPA - "one-day" lounge, without accommodation; Destination SPA – a resort or a hotel that is mainly attended due to the SPA procedures; Medical SPA; Mineral SPA – centres situated nearby natural mineral water springs; SPA hotel – a resort with a separately established SPA centre.

Yaman, R., Alias, Z., Ishak, N (Yaman, R., Alias, Z., Ishak, N., 2012) offer to separate one more type – a holistic SPA – a centre offering alternative medicine services. Parnyakov V. in the article *Innovation and design of cruise ship* (Parnyakov, V., 2014) discusses the term *Cruise SPA*.

The Common European SPA classification system can be reduced in the following three basic groups (SPA pec noteikumiem, 2016).

- 1) DAYSPA (one-day SPA) – it includes all the necessary treatments and salons that can be visited at any time convenient for the customer. It is usually located in urban areas.
- 2) MEDISPA – a SPA centre with professional medical focus; it includes clinics and rehabilitation centres.
- 3) SPA-hotel – it is mostly located in the resort cities. It offers everything a person needs to spend some time there and undergo a certain course of treatment. Those are 4-star (at least) hotels with a SPA complex.

All other options are a combination of the three above mentioned. All three often can be found in one place (SPA pec noteikumiem, 2016).

NACE 2nd ed. (Code 96.04.) has stipulated that the sector of physical well-being improvement services now includes such activities as various SPA massages, namely, healing with water treatment, and other relaxing treatment, body classical cosmetic massage, bath treatment, and other types that are specific to operations of, for example, the hotels' SPA and

wellness or health improvement establishments (Saimniecisko darbibu statistiska..., 2006).

The study by the State Education Development Agency on the beauty industry in Latvia reveals that the tendency of the so-called youth cult that is connected with people's effort to look as young as possible, often irrelevant to their actual age, will reduce in the beauty industry in Europe and in the world over the next 20 to 30 years. Industry experts interpret it as a result of various factors, such as the increase of a person's life expectancy that will promote public awareness of the fact that beauty is not only the external appearance or youth, but inner harmony and the ability to accept their actual age. The physical well-being services, including massage, SPA and other relaxing and therapeutic procedures are largely focused on this matter (Skaistumkopsanas nozares..., 2012).

Nowadays, a several types of SPA have developed: SPA hotels, SPA clubs, day SPA, destination SPA, medical SPA etc. Understanding of the SPA concept has changed over time. Today, even small beauty salons with jacuzzi and pool are called the SPA.

Latgale inhabitants' survey was carried out during the period from September 2016 to December 2016 to ascertain views on the potential use of the SPA services in the future 4 star hotel in Rezekne. In total, 580 respondents were interviewed; 539 questionnaires were valid for the analysis. The inhabitants of Latgale only were chosen to be surveyed, because they are primarily interested in the SPA centre development and are considered as the potential customers. According to the CSB data, population of Latgale region is 276 358 in 2016. Using a simple random method, the required number of respondents is 384 in order to affirm that the data obtained are reliable with a probability of 95 % and represent the general sample. Since a bigger number of respondents (539) were surveyed, it can be declared that the data obtained with a probability of 95 % represents

the inhabitants' views on the potential use of the SPA services (<http://www.raosoft.com/samplesize.html>).

The respondents represent the two major cities (Rezekne and Daugavpils) and all the districts of Latgale region. Most of the respondents are female (66.79 %). According to the data of the sector entrepreneurs' survey carried out by "Dienas Bizness", the proportion of male customers is between 10 to 50 %, depending on the type of the SPA services (Asere, 2014). Consequently, the number of respondents represents the overall situation in the industry – primarily women are interested in the SPA services.

The income level of most of the respondents is up to 400 EUR (36.36 %), and a little less – 31.73 % of the respondents earn 401-600 EUR. The respondents with income over 601 EUR constitute 31.91 %. Such a division of the respondents by the income level according to CSB data corresponds to the situation in Latvia.

In assessing the potential demand of the SPA services, the respondents were asked a series of questions in order to assess the need for the establishment of the SPA centre.

According to the respondents, all four of these factors affect the choice. The survey data confirm that, when creating the SPA centre, special attention has to be paid to the balance of quality and price of services. Location is the least important factor, meaning that the geographical range of the potential customers is quite wide, provided that there would be a wide range of high-quality services for reasonable prices.

The SPA centre attendance is associated with health improvement (87.9 %) for many respondents. The overall trend shows that society has been paying increasing attention to a healthy lifestyle.

The SPA centre attendance is a way of family recreation for 75.9 % of the respondents, meaning that the offer of the SPA centre must be suitable not only for adults but also for children,

such as a play room with both educational games and attractions for physical activity, appropriate personnel, for example, the possibility to hire a babysitter etc.

73.3 % of the respondents believe that the SPA is a good place to relax with friends or for leisure (71.8 %). This means that the SPA centre has to offer a variety of recreational facilities, such as bar, catering, bowling, disco or live music, sports facilities - billiards, table tennis etc.

Beauty care as a reason for attending the SPA centre is only for 69.5 % of the respondents, because large part of people carry out beauty treatments (for example, the beautician services), using "their" specialists in other beauty salons.

The SPA centre as a place to spend time with colleagues is seen only by 52.6 % of the respondents. This is due to the common collegial traditions in Latvia. In other countries, such as Germany, it is normal that colleagues relax together after work. Mostly, colleagues do not spend time together in non-working hours in Latvia.

The survey reveals the extent to which the seasonality will affect the SPA centre attendance. The results show that the largest demand of the SPA centre could be in the winter season (85.5 %) and the lowest in summer (43.7 %).

Most respondents believe they could use the SPA centre services once a month (55.5 %) or once every six months (51.6 %) as well as once a year (41.4 %). The authors consider that the owners of the SPA centre should pay special attention to this factor when developing the offer in order to motivate those who intend to use the SPA services once every six months to do it more often.

Division of the SPA

| Division | Description | Examples in Latvia, Lithuania and Estonia |
|------------------------|--|--|
| SPA – resort | Large centres near thermal waters or sea combining water cure with a variety of cosmetic procedures (SPA iedalījums, 2016). Tourists are able to use not only the SPA services, but also participate in various recreational activities in the SPA resort (Monteson, P., Singer, J., 2002). Visitors can receive healing services as well as to treat a variety of ailments in the SPA resort (Spilioti E., Vargiami M., Letsiou S. et al., 2016) The SPA resort has a service with a number of ancillary services as well as gym, pool, golf, and tennis (Retno I. Tranggono, 1999). A possibility to combine a healthy with a pleasant, SPA treatments and pleasures that fulfil customer's life (Monteson, P., Singer, J., 2002). | Estonia Resort Hotel & Spa, (Estonia) Baltic Beach Hotel & SPA (Latvia) |
| SPA – centre | The SPA centre services are meant for tourists who want to improve their health or simply relax, using all the SPA offers (Monteson, P., Singer, J., 2002). The SPA centres become increasingly popular due to their services that help customers to remove the physical and mental fatigue (Spilioti E., Vargiami M., Letsiou S. et al., 2016). | "Promenade Hotel" SPA (Latvia) |
| SPA – hotel | Hotel with the SPA complex situated on the territory of hotel. Its aim is to diversify the time hotel clients spend at a hotel, combining various recovery and relaxation procedures. The overall level of professionalism of the service staff is allowed to be a little lower, medical counselling is usually not provided. Such complexes usually offer a wide selection of facial and body skin care procedures and services of beauticians and stylists. Their diversity and quality depends on the hotel's prestige and class (SPA iedalījums, 2016). The SPA services are combined with the resort or hotel, offering the services of professional SPA, fitness and recovery, healthy nutrition (Thorsteinsdottir K., 2005). The SPA hotel – a tourist accommodation with a hotel-specific infrastructure, the client is offered water treatments and services for wellness and health improvement, including baths, saunas, swimming pool, massage, fitness club, slimming, cosmetic, beauty care, and other services. According to the SPA type, the service may also include special catering (Viesnicu standarta pamatprasibas saskaņa ar LVS 2000-1:2009). | "Spa Hotel Ezeri" (Latvia) "Pirita Spa hotel" (Estonia) Hotel Jurmala Spa (Latvia) |
| Day SPA | A variety of professional SPA services a client might use within a day (Thorsteinsdottir K., 2005). Services to improve health, with or without accommodation services. Much attention is paid to the beauty and wellness programs, such as facial and body treatments, manicure, pedicure, massage (Yaman, R., Alias, Z., Ishak, N. Y., Zarina A., Norishahaini M.I., 2012) Visit to the day SPA is fully dedicated to the revitalization and beauty. The category includes centres with beauty salons, hairdressing salons and hydrotherapy treatments (SPA iedalījums, 2016). | ESPA Rīga (Latvia) Day Spa OÜ (Estonia) Azia Spa (Lithuania) |
| SPA club | Usually it is a fitness centre with equipment for the water SPA procedures. These services are generally available to members only. The category includes any health club, gym, and recreation centre with the SPA area, which is separated from the active fitness area, offering a peaceful atmosphere. The range of services offered is similar to the Day Spa (SPA iedalījums, 2016). Fitness, aerobics, yoga, and other sports activities that are perfectly able to fit together with the SPA procedures (Thorsteinsdottir, K., 2005). | Joker klubs (Latvia) Tropic Fitness & SPA Club (Latvia) |
| Destination SPA | Customers manage their vacation as they wish in this type of SPAs; they can choose a variety of services and take break from the daily temptations, as a healthy menu is usually provided that does not include alcohol (Thorsteinsdottir, K., 2005). Companies, where the main product is SPA services, often combined with educational programs and healthy nutrition (Monteson, P., Singer, J., 2002). | Annas (Latvia) Taka SPA (Latvia) SPA Vilnius Anyksciai (Lithuania) Puhajarve Resort (Estonia) |
| Holistic SPA | It differs from other SPA, in particular with regard to the interior and the available treatment (Yaman, R., Alias, Z., Ishak, N. Y., Zarina A., Ishak, N.M., 2012). | Holistic SPA Hotel "La Passionaria" (the Czech Republic) |
| Medical SPA | Medical and recovery services as well as SPA services are offered. It is often combined with cosmetic/plastic surgery (Nagy, A., 2014). | Baltic Beach Hotel Spa (Latvia) |
| Mineral SPA | If the SPA therapy or any other treatment process uses mineral water or mineral mud, it may be compared to a whole treatment system (Forestier R., Forestier, F., Francon, A., 2016). The SPA uses the natural minerals, hot springs, and sea water. Minerals include such substances as calcium, magnesium, iron, bromine etc. (Broms, A., 2015) | Varska Resort (Estonia) Spa Vilnius Anyksciai (Lithuania) |

Source: compiled by the authors

The respondents of the survey had to evaluate which SPA centre services they would like to use.

89 % of the respondents would gladly use a bubble bath (jacuzzi) centre, 84.6 % - a swimming pool, and 80.5 % - underwater massage pools. Despite the fact that there are two swimming pools in Rezekne city, people are interested in having it in the future SPA centre as well. The understanding of a pool may be different in the SPA hotel - it should not be 25 m or 50 m long; it may be small and of different forms. The main goal is not to swim, but "to dabble" (although it is important for many people to swim). The pools have to be adapted for people with special needs, and offer different depths and temperatures.

63.8 % of the respondents would prefer using cascades, 62.5 % - a musical pool, while 58.6 % - aqua bar services.

The SPA centre is inconceivable without the sauna area. The responses show that any type of sauna would be accepted, since 80.7 % of the respondents would use the aroma sauna, 79.8 % - Finnish sauna, 77.7 % - steam baths (the Roman baths), 75.8 % - the salt sauna, and 72.1 % - the Turkish bath. The ice sauna (the Cryotherapy) would be used only by 60.2 % of the respondents. The authors believe that the low level of support for this sauna type is related to the respondents' lack of awareness and knowledge of this service.

91.1 % of the respondents would prefer using relaxing massages, 87.9 % - water treatments, and 80.1 % - the medical SPA. The aforesaid SPA services are the most commonly used and requested in the SPA centres. Only 53.5 % of the respondents would use SPA capsules.

The respondents rated their possible level of spending per visit at the SPA centre. Data suggest that a majority of the respondents (82 %) are willing to spend up to 15 EUR per visit, while a relatively large group (76.1 %) - 16-30 EUR. The authors believe that the SPA centre services should be focused to an amount

not exceeding 30 EUR as only 47.9 % of the respondents are willing to spend more than 31 EUR.

Conclusions

1) Based on the assessment of the accommodation services' offer in Rezekne city within the framework of the project "Assessment of the hotel services' development opportunities in Rezekne city", it is clear that Rezekne needs a new four-star hotel that would satisfy the growing demand for accommodation and the SPA services, as well as would prolong the tourists' duration of stay in the region.

The authors believe that the potential customers of the Rezekne SPA hotel are people with middle and high incomes who would use the SPA centre services to improve or maintain their health, to relax with family or friends, and it would be a good resting place. Since the location, according to the respondents' opinion, is not the most important factor, the potential customers are not only inhabitants of Rezekne city or region, but also people of other Latvian regions. The authors consider that the residents of the neighbour countries, for example, Lithuania or Estonia, also would use the SPA hotel services if they are designed in an interesting way, provide special offers, unprecedented and diverse SPA services (swimming pool, saunas, additional services, quality service). The services must attract customers and encourage to drive a fairly long distances with their personal transportation. The Embassy of Latgale "GORS" is a great sample, because its services are used not only by locals but also by people from other regions.

2) The customer flow and demand will be directly dependent on the range (diversity) of the services offered by the SPA and high quality, though, at the same time respecting the principle of a reasonable price, because most of the service users will be the customers of

- average incomes willing to spend relatively small amounts of money (up to 30 EUR per visit).
- 3) Since the demand for the SPA services will be higher in winter season than in summer, the developers of the SPA centre should use the strategy of differentiated pricing to provide a continuous flow of incomes – to offer services at a lower price when demand is lower (in seasons, days of the week, or hour of the day), and to set a higher price at a time when the demand is higher.
 - 4) Pools are considered as one of the integral parts of the SPA centre. The pool would be interesting to children, taking into account that many people consider the SPA centre to be a leisure opportunity for families.
 - 5) Bubble baths (jacuzzi), underwater massage pools, and also cascades should be built in the SPA centre. The variety of the services increases customers' satisfaction and desire to return more often.
 - 6) The sauna area as well as the swimming pool centre should diverse, offering unique and specific services.
 - 7) The SPA services should include relaxing massages, water procedures, and the medical SPA treatment.
 - 8) The establishment of the SPA hotel in Rezekne is necessary because the nearest SPA hotel is 250 km away, though a special attention should be paid to the quality of the offered services.

Bibliography

Journal paper with author(s)

1. Parnyakov, V. (2014). Innovation and Design of Cruise Ships. *Pacific Science Review*, Vol. 16, pp. 280-282.
2. Thorsteinsdottir, K. (2005). The State of the European Hotel Spa Sector. *Journal of Retail & Leisure Property*, Vol. 4, No. 3, pp.272-277.

Internet sources

3. Broms, A. (2015) *What is a Mineral Springs Spa?* Retrieved: <http://spas.about.com/od/choosingaspabasics/a/mineralsprings.htm>. Access: 14.12.2016.
4. *European SPAs Association Quality Criteria of the European SPAs Association (ESPA)*. Retrieved: http://www.espa-ehv.eu/media/130/File/quality_criteria.pdf. Access:12.12.2016.
5. Forestier, R., Forestier, F., Francon, A. (2016). *SPA Therapy and Knee Osteoarthritis: A Systematic Review*. *Annals of Physical and Rehabilitation Medicine*, Volume 59, Issue 3. Retrieved: <http://www.sciencedirect.com/science/article/pii/S1877065716000361>. Access:15.12.2016.
6. *Global Market Size of the Wellness Tourism Industry from 2012 to 2017*. Retrieved: <https://www.statista.com/statistics/318605/global-market-size-of-the-wellness-tourism-industry/>. Access: 01.12.2016.
7. ISPA Definition of SPA. Retrieved: <http://experienceispa.com/>. Access: 03.12.2016.
8. *Kas tas ir SPA? (What is that – a SPA?)*. Retrieved: <http://www.vietas.lv/index.php?p=10&id=568>. Access: 18.12.2016.
9. Monteson, P., Singer, J. (2002). *Planning and Operating a Resort-Based SPA*. *Journal of Leisure Property*, Henry Stewart publications, Vol.2, No.4, pp. 358–368. Retrieved: <http://link.springer.com/article/10.1057/palgrave.rlp.5090156>. Access: 10.12.2016.
10. Nagy, A. (2014). *The Orientation towards Innovation of Spa Hotel Management*. *Social Behavioural Sciences*, Vol. 124, pp. 425–431. Retrieved: <http://www.sciencedirect.com/science/article/pii/S1877042814020527>. Access:11.12.2016.
11. *Primary members*. Retrieved: <http://experienceispa.com/about/bylaws>. Access: 19.12.2016.
12. Saimniecisko darbību statistiska klasifikācija Eiropas Kopienā (Statistical Classification of Economic Activities in European Community). (2006). 2nd Edition. Retrieved: <http://www.csb.gov.lv/node/29900/list/4/0>. Access:14.12.2016.
13. Skaistumkopšanas nozares apraksts (Description of Beauty Care Industry).
14. Retrieved: http://viaa.gov.lv/files/free/12/14912/apraksts_skaistumkopšana_final_04042012.pdf. Access:21.12.2016.
15. *SPA iedalījums (SPA Classification)*. Retrieved: <http://www.termorelax.com/web/?id=402014>. Access:20.12.2016.
16. *SPA pēc noteikumiem (SPA in Accordance with Rules)*. Retrieved: <http://3ade.lv/lv/spa-pec-noteikumiem-388.html>. Access:20.12.2016.
17. Spilioti, E, Vargiami, M., Letsiou, S., Gardikis, K., Sygouni, V., Koutsoukos, P., Chinou, I., Kassi, E., Moutsatsou, P. (2016). *Biological Properties of Mud Extracts Derived from Various SPA Resorts*. Retrieved: <http://link.springer.com/article/10.1007%2Fs10653-016-9852-y>. Access: 30.11.2016.

18. Tranggono, R. (2000). *The Influence of Spa Products Treatment for Skin-Care*. (1999). Journal of Applied Cosmetology, Vol.18, pp.171-184. Retrieved: <http://iscd.it/files/THE-INFLUENCE-OF-SPA-PRODUCTS-TREATMENT-FOR-SKIN-CARE.pdf>. Access:25.11.2016.
19. Viesnicas un citas turistu mitnes republikas pilsetas un novados pa ceturksniem (Hotels and Other Tourist Accommodation in Cities and Regions by Quarters). Retrieved: http://data.csb.gov.lv/pxweb/lv/transp/transp__istern__turisms/?tablelist=true&rxid=cdbc978c-22b0-416a-aacc-aa650d3e2ce0. Access: 20.11.2016.
20. Viesnicu standarta pamatprasibas saskana ar LVS 200-1:2009 (Basic Requirements of the Hotel Standards in Accordance with LVS 200-1:009). Retrieved: http://www.turisms.tukums.lv/files/LVS_standarts_naktsmitnes.pdf. Access:21.11.2016.
21. Yaman, R., Alias, Z., Ishak, N. (2012). Beauty Treatment and Spa Design from Islamic Perspective. Social and Behavioral Sciences, Vol. 50, pp.492-50. Retrieved: <http://www.sciencedirect.com/science/article/pii/S1877042812031916>. Access:11.12.2016.

INTEGRATED COASTAL MANAGEMENT PRACTICE CASE STUDIES: DEFICIENCY OF COLLABORATION COMMUNICATION AND SOCIO-ECOLOGICAL SYSTEM APPROACHES

Raimonds Ernsteins¹, Dr.habil.paed.; **Anita Lontone – Ievina**², MSc.env.;
Erika Lagzdina³, MSc.env., **Krista Osniece**⁴, MSc.nat.sc.; **Janis Kaulins**⁵, Dr. geogr.;

^{1, 2, 3, 4 5} Environmental Science Department, University of Latvia

Abstract. Sustainable coastal governance understanding nowadays still require internationally prescribed integrated coastal management (ICM) approach for both coastal socio-ecological systems studies as well as policies/planning and management practice development. Systems Approach Framework (SAF) as an issue oriented and system analysis based investigation and development planning methodology offers this to be further tested new tool in order not only to study complex coastal systems, but, also complementary, to facilitate participatory problem-solving decision making, what altogether have been correspondingly investigated and tested in the framework of EU BONUS Programme BaltCoast project. The aim of one part of the joint project study was to summarize main findings from retrospective analysis of the best available ICM practice, based on cases from the Baltic Sea Region countries and, particularly, those ones from Latvia coast, as well as to recognize main deficiencies and approaches necessary for further ICM improvement, what are also the main tasks for this paper. Nineteen selected ICM best practise cases were studied accordingly. Obviously, that main known ICM elements, have been recognized in practice cases all around Baltic, but only to different degree as per different contexts and coastal issues studied. However, SAF, or similar coastal system approaching, as well as participatory management requiring applications, have not been regularly and widely used. Latvia ICM case studies also particularly do confirm ongoing requirement for social-ecological system understanding and necessary multi-disciplinary studies, and, related/depending development of collaboration communication approach, based on complementary instruments of coastal information and education, participation and coastal friendly behaviour elaborations.

Key words: integrated coastal management, socio-ecological coastal systems, systems approach framework, best practice cases, collaboration communication.

JEL code: Q55

Introduction

Coastal systems are based on interconnected elements of complex resources systems complementing all sustainability dimensions as natural, socio-economic and also governance resources – coastal territories are to be seen as social-ecological systems (SES). Inadequate use, protection and management of the coastal territories in general are responsible for the instability of the coastal systems (Cooper, J.A.G., Cummins, V. 2009). There is a need for a systemic approach and the instruments that would support our ability to understand and communicate changes in the coastal systems (Waagsaether, K., Ziervogel, G., 2012)., and respond adequately through the governance system, including stakeholders and a whole set of governance and, especially also, communication instruments (Ernsteins R., et.al. 2011).

Following question is how to improve the coastal governance process and decision making procedure. The knowledge gained from applied

experiments concerns the practical aspects for the development: governance in terms of policy effectiveness; sustainability science in terms of applying trans-disciplinary science to social-ecological problems; simulation analysis in terms of quantifying dysfunctions in complex systems; partnership among research, management, and stakeholders as for a quantitative basis for collaborative decision making (Hopkins, et al., 2012). Further on, there are to be recognized basic pre-conditions for the elaboration of governance options, also based on communication (Ernsteins R., 2010) – balanced sharing of information with stakeholders, creation of space for common dialogue and repeated communication with stakeholders (Mette, 2011).

The paper presents principal results of the first part of the studies carried out within EU BONUS Programme BaltCoast project (Systems Approach Framework for Coastal Research and Management in the Baltic, 2015-2018) having namely two main aims: 1) a retrospective

analysis of existing integrated coastal management (ICM) best practise case studies and 2) provision of a broad knowledge base for the further development of ICM and for the chosen Systems Approach Framework (SAF) methodology, which was developed by the SPICOSA project (Hopkins et al., 2012).

SAF methodological approach. SAF contribution to ICM is dedicated to understanding and diagnosing the end-user as a partner in the coastal governance options development process (Ostrom, 2009), but the system specific monitoring and compatible multidisciplinary databases are essential precondition (Karpouzoglou, T., et.al. 2016) as well as the need to increase the capacity for governance problems analysis (Conrad, C., Hilchey, K. 2011). SAF methodology approach, has been based not only on "classical" stakeholders' participation, but combining science-based data investigation and stakeholders' interactive involvement in ICM development scenarios evaluation, when solving local coastal problem situations. The aim of one particular part of the joint project study was to summarize main findings from retrospective analysis of the best available ICM practice, based on cases from the Baltic Sea Region countries and, particularly, those ones from Latvia coast, as well as to recognize main deficiencies and approaches necessary for further ICM improvement, what are also the main tasks for this paper.

To foster the exchange of experiences and learning from best practice examples, the European Commission maintains the OURCOAST online database (<http://ec.europa.eu/ourcoast/>), which has about 350 structured case studies on major coastal themes. Initial selection of these cases for the ICM Database were done during execution of the EU granted project OURCOAST (2009 – 2011), being based on national and international ICM expert's judgements – as their understanding of successfulness of application into practice of the general ICM approach and

tools, according to the definition of the eight ICM basic principles (Recommendations of the European Parliament ..., 2002). Also at the selection was requested clear integration principle application in following terms: integrated coastal development aims, vertical cross-level and horizontal cross-sectorial integration, as well as stakeholder participation integration. There were particular types of processes and tools chosen, which have been divided in 6 main key approaches: integration; participation; knowledge-based; ecosystems based approach; socio-economic; technical.

Methods and case studies applications

Re-analysis was done based on the verification of SAF steps/elements application in the ICM local cases studied: 1) issue identification, 2) formulation, 3) appraisal, 4) output, 5) implementation 6) follow up step. The tool used by all project partners to summarize answers, was SAF steps-based designed questionnaire form (Excel format) with predefined choices for standard answers (yes, no, don't know) and several open-ended questions, and also a specific format for SWOT analysis and summary (10 grades). Comprehensive interview series with local ICM experts familiar with the cases were done, but also document studies and stakeholder interviews took place in the most of studies (Jansen H., Ernsteins R., 2016).

Taking into account local specifics, thematic representation and best available ICM qualities, there were totally 19 cases selected and proposed for analysis by all 7 project partner countries, but covering all 9 Baltic sea region countries (Table 1.) as the Russian and Finnish cases were covered by the Lithuanian partner team involving experts from respective countries. National experts that documented their national ICM best practise cases for the OURCOAST database have been involved for re-analysis as having already full access to all documents and related context (Jansen H., Ernsteins R., 2016).

management in relation to agricultural activities (farming, dairy farming).

Table 1

The list of cases and countries

| Country/Author | Case title |
|--|---|
| Germany (Leibniz-Institut für Ostseeforschung Warnemünde, 2015) | Coastal realignment, wetland restoration in Geltinger Birk |
| | Coastal protection, realignment, role of public participation in Markgrafenheide |
| | Coastal protection and management: Timmendorfer Strand – Scharbeutz |
| Poland (Institute of Hydro-Engineering, Polish Academy of Sciences, 2015) | Changing policy to halt beach erosion effects for tourism sustainable management: Hel Peninsula |
| | Case study: Szczecin Lagoon |
| Denmark (Technical University of Denmark - National Institute of Aquatic Resources, 2015) | Integrated management of mussel fishery and aquaculture under changing baselines due to regime shifts in the Limfjord |
| | Fishery and aggregate extraction in the Sound |
| Lithuania (Marine Science and Technology Centre, Klaipeda University, 2015) | Restoration of important habitats through sustainable agricultural practices, Rusne |
| | Integrated shoreline management for a large harbour city and an adjacent seaside resort |
| Russia (Marine Science and Technology Centre, Klaipeda University, 2015) | Russian part of the cross-border Neman River Catchment |
| | Russian case study: Vistula Lagoon |
| Latvia (Environmental Science Department, University of Latvia, 2015) | Ventspils voluntary municipal Environmental licensing system |
| | Liepaja coastal zone voluntary spatial/thematic planning |
| | Public self-organized process for Pavilosta Natura2000 site |
| Estonia (Institute of Ecology, Tallinn University, 2015) | The Järve - Nasva case-study |
| | The Kunda Port case study |
| Finland (Marine Science and Technology Centre, Klaipeda University, 2015) | Coastal management strategy for southwest Finland |
| | Case study: Sea of Bothnia, western Finland |
| Sweden (Swedish University of Agricultural Sciences, 2015) | Implementation of the Water Framework Directive: The North Baltic Water District in Sweden |

Source: Lagzdina E., Lontone A., 2016

Results and discussion

General ICM and SAF in Baltics. Cases selection for BaltCoast SAF based studies were done according to the recognition of both as wide

Coastal issues. Baltic Sea Region cases chosen dealt especially with complex issues related to the ICM, which require the use of system approach. There were clearly dominating issues of following coastal environmental management themes as representing 2/3 of all cases (even often covering several themes by each case): nature protection, management of protected nature sites or specific ecosystems (grasslands, wetlands) (totally 8 cases); coastal/dunes erosion (6 cases); floods, storms (5 cases); sea level rise (3 cases). Also water quality, pollution as well as river mouth, estuary problems (2 cases each group) were present, but just one case each were chosen for following issues - management of natural resources (sand extraction), species (migratory birds) protection, coastal protection, landscape protection, climate change (Lagzdina E., Lontone A., 2016).

Instrumental approach. Four cases were related to the planning instruments: ICM of coastal zone (spatial planning - 2 cases), river basin areas management planning according to the ecosystem or the EU Water framework directive requirement (2 cases). Eight cases were related to technical (infrastructure) instruments (flood defence systems, coastal realignment, wetlands restoration etc.), but two cases suggested environmental communication instruments - establishing monitoring system, improving public environmental education and awareness raising. No other instruments were represented quite obviously.

Sector approach. Also quite understandably there were majority of cases (10 cases) related to use of the coastal area for tourism, resort, and recreational activities as public high interest topics. Seven cases were addressing sea (water) based activities (shipping, fisheries and aquaculture), but four cases - ICM situation in /or near large urban centres and in the harbours/ports. Just two cases address non-traditional topics like coastal resources

¹ Corresponding author - Anita Lontone-Ievija. Tel.: + 371-29923106, E-mail address: anita.lontone@lu.lv.

spread as possible complex and socio-ecological system cases and also participatory decision-making cases hopefully in one coastal problem situation. Not all of the OURCOAST cases selected for BaltCoast studies appears to be best-practice ICM cases as having not gone through known ICM process (Jansen H., Ernsteins R., 2016). During the project studies there were chosen also some non-OURCOAST cases as have been done either after 2011 or representing more SAF type approaches even not fully ICM approach finalized. Selection of cases for SAF analysis by the issue type and, particularly, by management instruments and sectors, do not represent the whole quite systemic ICM elements/approaches selection spectrum, being done for Ourcoast data basis, but are showing us those ICM really functioning components/instruments, which have had both – more public interest/sensitivity and, relatedly, also more SAF type applications.

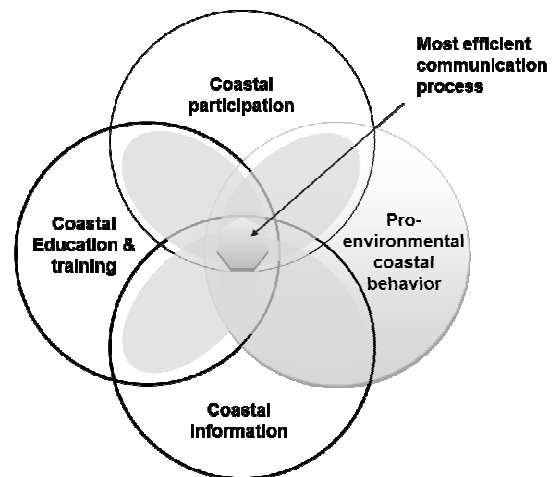
In most of the analysed case studies the ICM practice has been different from the SAF theory, but in many cases there were recognizable some, mainly most known traditional, ICM items being related to the separate SAF approach elements. Also comprehensive systematic/systemic analyses as for coasts as complex SES were found seldom and they did usually not cover all three pillars of sustainability, incl. national/local culture traditions/approaches. Looks like, in many cases the analytical basis for the ICM type decision-making have not been sufficiently developed (Jansen H., Ernsteins R., 2016).

General problems found are related to the following main/important issues: ICM project/problem team (and/or expert group surrounding) establishment and their working practice as multi-disciplinary and comprehensively; stakeholder full scale and whole problem-solving period participatory appropriate forums/media and communications; limited or formal participation (only legal requirements steps etc.) as such; often only top-down or, rarely, bottom-up approaches used and

often lacking even basic collaboration elements etc. (Lagzdina E., Lontone A., 2016). Two partner detailed studies on SAF application finished and related papers are now published - Schernewski G., et al (2017), and Støttrup J. G. et al (2017).

Coastal governance and communication in Latvian cases.

Following is short description of three cases, which could be seen also as complementary ones in terms of main approaches used. Also, there should be initially mentioned, that the main issue related to Latvian ICM situation is: lacking of coastal (and ICM) complexity and SES bases understanding and stakeholder's collaboration. Subsequently, collaboration communication model (Ernsteins R., 2010) application (Figure 1.) was developed and tested in several environmental and coastal cases, both at local and national level (e.g. National Environmental communication and education Strategy, 2001), relying on four complementary components/instruments: information and education/training, participation and pro-environmental behaviour.



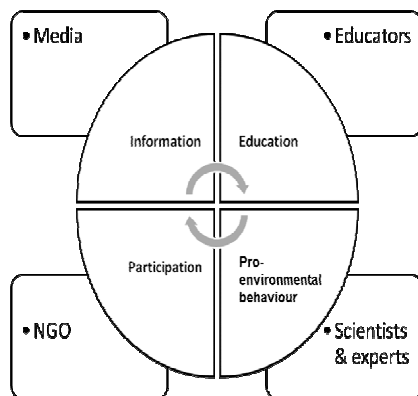
Source: (Ernsteins R., 2010)

Fig. 1. Collaboration communication four instruments model for ICM facilitation.

Important is to be mentioned also necessary role and interaction of four main mediator's groups into direct implementation of collaborative communication of ICM practice (Figure 2.). Both models, as well as general main eight stakeholders model (Figure 3.) have been

extensively locally tested and could be used also during this SAF analysis too (Ernsteins R., 2010).

Public self-organized Pavilosta NATURA 2000 site establishing. This case is known as most comprehensive long term public self-organized process in Latvia and was done for Natura2000 site establishment. Since 2007 established, Pavilosta Grey Dune nature reserve, covers 42 ha to protect Latvia's widest grey dune, that stretches 1,5 km parallel to the seacoast and 812 m inland, and other valuable biotopes and species found. Municipality administer 515 km² territory with 46 km long seashore border, having population less as 3000.



Source: (Ernsteins R., 2010)

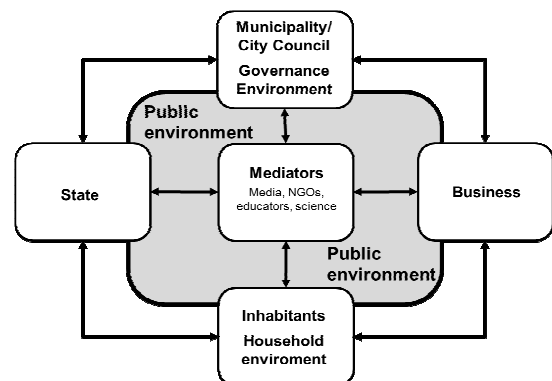
Fig. 2. Collaboration communication model instruments and main four mediators' interaction.

Process. Pavilosta case was selected as a specific example of the **bottom-up governance initiative**. In 1999, responding to the society initiative, the Pavilosta Municipal Council created an institutional coastal governance instrument - Dune Protection Commission (consisting not only of some deputies, but also especially of public/expert representatives). After discovery of semi-illegal construction on the coastal dunes, protested by the public, Commission was dismissed. Shortly after that, few environmental activists, supported by local school students, launched grey dunes protection movement.

SES and decision-making participation. Activists, having had not wide local population support, worked closely with various national-scale organizations, environmental NGOs, culture

organizations, churches etc. – a lot was done by the activist group to attract public attention and create political support to the protection of this natural area. This raised interest also from various scientists (mainly bio-science specialists - biologists, botanists, and conservationists), joining activists and professionally supporting.

Communication. In general, it has to be concluded, that this dune protection activity is the best wide targeted public participation process known in Latvia, what was informing, educating and involving all main target groups (Figure 3.) – besides local government, businesses, active part of local society, also nationwide mediators, known scientists and artists, leading politicians and personalities have been participating in different support activities, particularly, in the pro-environmental behaviour ones. There were complementary used the whole set of collaboration communication instruments.



Source: (Ernsteins R., 2010)

Fig. 3. Main stakeholder groups constellation: national/state and municipal governance, general public/inhabitants and business, mediators – media, NGO, educators and scientists.

Impact and learning. Currently, there is one competent and active environmental NGO in the municipality and municipal council supports some NGO activities, providing some financial support. However, the conflict between the society and local government is not exhausted – in the relation to the NATURA 2000 site, it could be observed that the local government have not much incentives, but NGOs have not much possibilities to engage with the protected site management issues.

Ventspils municipal voluntary Environmental licensing system (ELS). ELS was operating in Ventspils coastal municipality (around 40 000 inhabitants) in 1994 – 2009 as stemming from international experience, being approved by the Municipal Council decision as local legal regulation and so applied to 83 enterprises. The main task of Regulation was to establish governance system for coastal/environmental protection and rational use of natural resources, and, to provide municipal specialists and general public with information on impact of economic activities to the Baltic Sea and local environment, as well as to improve public participation in the local decision-making.

Process. ELS was **top-down but voluntary coastal/environmental instrument** (still the only one in Latvia), being initiated by public growing requirements on environmental security in the harbour town after regaining national independence, what also provided possibility for municipality to work in accordance with EU integrated pollution prevention legislation long before Latvia`s accession to the EU in 2004.

SES and decision-making participation. The Regulation requested, that every existing or newly established business activity, which cause or may cause negative impact on the environment, must obtain environmental license from the municipality, to be issued only after the following: enterprises organize study and prepare SES type overview of their activities to be presented for public discussion to the municipality, placed in libraries etc.

Communication. Municipal Council worked pro-actively to enable its citizen`s role in the local decision-making process. The municipality used mediators: mass media channels (regional newspaper and local television), schools and non-formal education institutions as libraries, NGO`s to disseminate information and participation tools, thus reach local people and acknowledge pro-environmental behaviour. As a result, the local society was provided with comprehensive

information about impacts of any entrepreneurial activity on the quality of the environment, public participation and cooperation with all local stakeholders was strengthened, as well as pro-environmentally behaviour was facilitated, what all-in-all was re-affirming ELS as an effective environmental communication tool.

Impact and learning. ELS also created preconditions for the implementation of voluntary environmental management systems (ISO 14001 standard) in the major local/harbour businesses. With the development of the national environmental legislation after Latvia was joining EU, the function of polluting activities control was given to the governmental Regional Environmental Boards, which were issuing integrated permits for polluting activities and using natural resources. After ELS was stopped, municipality have developed legal regulations on public participation.

Liepaja municipal voluntary coastal thematic planning. Besides three mandatory documents at all governance levels (long-term sustainable development strategy, mid-term development programme and spatial plan), there are voluntary ones – particular detailing of planning is possible by either action plan, local spatial plan or thematic plan, what all allow to integrate spatial and development elements under selected thematic issue. Liepaja municipality (around 75 000 inhabitants) is the first municipality in Latvia having prepared coastal zone development thematic plan (2015), what includes elements of the ICM approach.

Process. The thematic plan envisages coastal zone development activities until 2024 and it could be seen as both and **complementary – top-down and also bottom-up process.** It was elaborated as agreement in the participatory process between all different stakeholder groups about long-term vision of the beach, nearby infrastructure and architectural elements.

SES and decision-making participation. Planning process was started in 2012 and

comprehensive multi-disciplinary environmental studies were commissioned and comprehensive public survey was carried out, later being analysed and discussed by stakeholders. Spatially it is based on several development axes: municipal transport lines; bicycle road and local "sea gates" (providing access to the beach). The main thematic issues for the coastal development were related to how to link beach with the city, security and information in the beach, environmental risks, functionality and improvement of services oriented towards existing natural and cultural (including historical) heritage and values, territorial integrity and dune erosion mitigation tasks.

Communication. Also in Liepaja municipality worked pro-actively to enable its citizen's role in the local decision-making process. The municipality used all mediators as well, working with coastal information, education and participation tools, also planning and discussing coastal pro-environmental behaviour. As a result, pro-environmentally behaviour was facilitated for all target groups, starting from municipality itself. This was pro-actively planned based on since 2009 existing environmental communication plan, agreed by stakeholders to be as chapter no.1. of municipal Environmental Action Programme (2009-2015).

Impact and learning. In general, the document was agreement between various interests and visions as regards long term development of the coastal territory, as well as their specific perception of infrastructure and architecture elements important for a particular scale of the spatial planning. This agreement is binding for the local politicians and cannot be changed unilaterally without public discussion.

Summary and conclusions

1) Despite all international/national long-term efforts, ICM approach implementation still has been not fully understood and implemented, especially, taking into account local level specifics. Many studied ICM cases are missing

both, the SES content to be done by multi-disciplinary studies approach, cross-sectorial and cross-level integration and also real stakeholders participatory decision-making process.

- 2) General ICM problems solving still do require basic pre-conditions, generic and innovative ones, e.g. initially developing/pro-actively involving cross-disciplinary trained and working project/problem team, designing coastal collaboration process for all main stakeholder's interests' formulation and interaction process, creating communication forums/media for initiatives and complementary applying of top-down and bottom-up approaches.
- 3) Particularly, for avoiding ICM deficiencies mentioned, coastal collaborative communication shall be developed, all main target groups and related coastal topics selectively and multi-thematically oriented, and based on four complementary components/instruments as information and education/training, participation and pro-environmental behaviour.
- 4) ICM requested coastal nature-social science results interaction needed is to be transformed into local level science-policy-practice chain governance, and that could be done as particular interface process and content development, being based on structural design of to be elaborated/tested local municipal coastal monitoring system (incl. citizen science approach) as part of local municipal development governance. (Kudrenickis, I., Ernsteins, R., Kaulins, J., 2016).

The study and the paper have been prepared with the financial support of the EU BONUS programme project "A Systems Approach Framework for Coastal Research and Management in the Baltic" (BaltCoast).

Bibliography

1. Cooper, J.A.G., Cummins, V. (2009). Coastal Research and Policy Integration in Northwest Europe. The COREPOINT project. *Marine Policy*. 33, pp. 869-870.
2. Economics Department, Swedish University of Agricultural Sciences (2015). Coastal Case Reanalysis. Implementation of the Water Framework Directive: The North Baltic Water District in Sweden. EU BONUS Programme BaltCoast project. Uppsala, Sweden. (not published).
3. Environmental Science Department, University of Latvia (2015). Coastal Case Reanalysis: 1. Ventspils voluntary municipal Environmental licensing system; 2. Liepaja coastal zone voluntary spatial/thematic planning; 3. Public self-organized process for Pavilosta Natura 2000. EU BONUS Programme BaltCoast project. Riga, Latvia. (not published).
4. Ernsteins R. (2010). Sustainable coastal development and management: Collaboration communication and governance. Human resources – the main factor of regional development. *Journal of Social Sciences*, No.3, Klaipeda University, Klaipeda, pp.247-252.
5. Ernsteins, R., Kaulins, J., Lice, E., Stals, A. (2011). Integrated Coastal Management for Local Municipalities in Latvia: Sustainability Governance and Indicator System. *WIT Transaction on Ecology and the Environment*. Vol 149, WIT Press, pp. 29–40.
6. Hopkins, S., Bailly, D., Elmgren, R., Glegg, G., Sandberg, A., Støttrup, J. G. (2012). A Systems Approach Framework for the Transition to Sustainable Development: Potential Value Based on Coastal Experiments. *Ecology and Society*, Vol. 17 (3), p. 39.
7. Institute of Ecology, Tallinn University (2015). Coastal Case Reanalysis: 1. Jarve-Nasva Case-study; 2. Kunda Port case study. EU BONUS Programme BaltCoast project. Tallinn, Estonia. (not published).
8. Institute of Hydro engineering, Polish Academy of Sciences (2015). Coastal Case Reanalysis: 1. Changing policy to halt the effects of beach erosion sustainable tourism management: Hel Peninsula; 2. Szczecin Lagoon Case. EU BONUS Programme BaltCoast project. Gdansk, Poland. (not published).
9. Jansen H., Ernsteins R. (2016). Re-evaluating best-practice ICZM case studies around the Baltic Sea. *EUCC magazine "Coastal & Marine" Special "Recalling ICZM – Insights from the Baltic"*. Vol. 25, No. 2016-2, pp. 6-7. ISSN 1877-7953
10. Karpouzoglou, T., Dewulf, A., Clark, J. (2016). Advancing Adaptive Governance of Social-Ecological Systems through Theoretical Multiplicity. *Environmental Science & Policy*. Vol. 57, p. 1–9.
11. Kudrenickis, I., Ernsteins, R., Kaulins, J. (2016). Sustainable Coastal Science-Policy Interface Development: Municipal Governance Indicator System. *Environmental Science*, No.1, p. 255–264.
12. Lagzdina E., Lontone-Ievina A. (2016) *Reports Covering Coastal Re-analysis studies, Deliverable D4.1*. EU BONUS BaltCoast project, Environmental Science Department, University of Latvia, Riga, 44p.
13. Leibniz Institute for Baltic Sea Research (2015). Coastal Case Reanalysis: 1. Coastal realignment and wetland restoration Geltinger Birk; 2. Coastal protection & realignment and the role of public participation in Markgrafenhede; 3. Coastal protection management: Timmendorfer Strand – Scharbeutz. EU BONUS Programme BaltCoast project. Warnemunde, Germany. (not published).
14. Marine Science and Technology Centre, Klaipeda University (2015). Coastal case reanalysis: 1. Restoration of important habitats through sustainable agricultural practices; 2. Integrated shoreline management for a large harbour city and an adjacent seaside resort; 3. Russian part of the cross-border Neman River Catchment (Russia case study); 4. Vistula Lagoon (Russia case study); 5. Coastal management strategy for southwest Finland (Finland case study); 6. Sea of Bothnia, western Finland (Finland case study). EU BONUS Programme BaltCoast project. Klaipeda, Lithuania (not published).
15. Mette, A., (2011). Bridging the Gap between Science and Society. In: P. Tett, A. Sandberf, A. Mette, editors. *Sustainable Coastal Zone Systems*. Dunedin Academic Press, Edinburgh, UK, pp. 103–135.
16. National Institute of Aquatic Resources, Technical University of Denmark. (2015). Coastal case reanalysis: 1. Integrated management of mussel fishery and aquaculture under changing baselines due to regime shifts in the Limfjord; 2. Fishery and aggregate extraction in the Sound. EU BONUS Programme BaltCoast project. Charlottenlund, Denmark. (not published).
17. Ostrom, E. (2009). A General Framework for Analysing Sustainability of Social-Ecological Systems. *Science*, No. 325, p. 419–422.
18. Recommendations of the European Parliament and of The Council Concerning the Implementation of Integrated Coastal Zone Management in Europe (2002) 413/EC, OV L 148, 2002
19. Schernewski G., Bartel C., Kobarg N., Karnauskaite D. (2017). Retrospective Assessment of a Managed Coastal Realignment and Lagoon Restoration Measure: Geltinger Birk, Germany. *Journal of Coastal Conservation Planning and Management*. pp 1-11
20. Støttrup J. G., Dinesen G. E., Janßen H., Schernewski G. (2017). Re-visiting ICM theory and practice: Lessons learned from the Baltic Sea Region. *Ocean & Coastal Management*. Vol. 139, 2017, pp 64–76
21. Waagsaether, K., Ziervogel, G. (2012). Bridging the Communication Gap: An Exploration of the Climate Science–Water Management Interface. In W. Leal Filho (ed.), *Climate Change and the Sustainable Use of Water Resources, Climate Change Management*. pp 485-499

SMART SPECIALIZATION STRATEGY IN LATVIA, ESTONIA AND LITHUANIA

Sergejs Gemma¹, MPA; Zane Bulderberga², Dr.oec.

^{1,2} Latvia University of Agriculture

Abstract. The smart specialization strategy is a tool for European Union (EU) economic growth and recovery from economic crisis. The aim of the paper is to describe and compare the smart specialisation strategy (RIS3) in Latvia, Estonia and Lithuania by describing the theoretical aspects of smart specialization concept in state and regional level; analysing smart specialization strategy development in the EU in accordance to Europa 2020 targets; comparing and evaluating the smart specialisation strategies in Latvia, Lithuania and Estonia. The three Baltic States have made the most progress to the EU 2020 targets in 2015. All three Baltic States have set common priorities for RIS3: ICT, biomedicine and health technologies, materials, technologies and engineering systems. Smart energy is a priority in Latvia and Lithuania, but functional food and logistics - in Lithuania and Estonia. Lithuania is the only country of Baltic States which has set a priority regarding to the inclusive and creative society area.

Key words: smart specialization strategy, innovation.

JEL code: R11; O31; P48

Introduction

The existence of a national strategy for smart specialization is an ex ante conditionality for the use of the European Union (EU) Structural Funds from 2014 to 2020. The aim of the strategy in Europe is to become competitive in the global economy by concentrating resources in research and innovation (R&I) and linking them to priority economic areas. It is also topical for Baltic States as the EU Member States. The main aim of smart specialization strategy in Latvia is to increase innovation capacity and to create an innovation system that promotes and supports technological progress of economy (Informativais zinojums "Par ..., 2013).

The aim of the paper is to describe and compare the smart specialisation strategy in Latvia, Estonia and Lithuania. The tasks of research are: (1) describe the theoretical aspects of smart specialization concept in state and regional level; (2) analyse smart specialization strategy development in the EU in accordance to Europa 2020 targets; (3) compare and evaluate the smart specialisation strategies in Latvia, Lithuania and Estonia. The research methods are: monographic, comparison, abstract-logical method, synthesis and analysis, induction and deduction, graphical method and statistical data analysis.

Research results and discussion

The smart specialisation strategy: the theoretical analysis

The concept of smart specialization has attracted great interest and has been adopted widely in European regional and innovation policy. In scientific literature, first ideas about smart development strategy at the EU level appeared already between 2006 and 2009. The concept of smart specialization was elaborated by the group of researchers that actually advise the European Commission called as 'Knowledge for Growth'. According to them smart specialisation means the discovery of those potential domains or areas, which are based on exceptional features and assets of each region in order to reinforce the regional economy and build its competitive position on the global market (Gulc A., 2015). zx

The smart specialization strategies of countries with a small economy like the Baltic States should be focused on identification of the unique characteristics of each country and region highlighting competitive advantages of each region. The underlying rationale behind the smart specialization concept is that by concentrating knowledge resources and linking them to a limited number of priority economic activities, countries and regions can become more competitive in the global economy (Jucevicius R., Galbuogiene A., 2014).

Lithuanian researchers (Paliokaite A., Martinaitis Z., Reimeris R., 2015) emphasize that smart specialization needs to be communicated, understood and acknowledged, governance of smart specialization strategy has to ensure participation and ownership in the foresight process and implementation of smart specialization strategy. And also smart specialization process has to encourage innovation and experimentation, so it has to include creative thinking outside the list of fields that are "usual suspects" for research and innovation support.

About smart specialization in regional level writes Polish researcher Gulc (2015): smart specialization does not mean only supporting of existing strengths of the regions but rather finding the new possibilities of their development. Each region can find new areas of development based on local known by diversifying the existing specialization and finding the synergy and links between them. The results in Polish regions showed a big variety of utilized research methods designing smart specialization. Naldi, Nilsson, Wetlund and Wixe (2015) also studied that regions respond differently to investments in innovation – investments in core regions are more efficient when it comes to generating innovations compared to investments in peripheral regions. So, the regions should do smart specialization – identify the sectors, the technological areas or their main competitive advantage and then focus their regional policies to promote innovation exact in these fields (Naldi *et al.*, 2015).

At regional level, Mccann and Ortega-Argiles (2013) think that one of the features of many European regions is a weak correlation between the region's research and development capabilities, its training specializations and its industrial structure. It is necessary to develop regional policies that promote technological diversification amongst the most embedded industries, which have the relevant scale to

generate significant local impacts, whilst at the same time promoting the connectivity of the region.

In Latvia, the smart specialization assessment was done by Pelse and Lesevica (2016) using RIS3 Assessment Wheel. Comparison of the smart specialization strategies of Latvia and Lithuania reveals that a great deal of their priorities is similar, having different definitions.

Other Latvian researchers have analysed situation in Kurzeme region. The smart specialization model for the region should cover key values of the region, which comprise location, national resources, high biological and landscape diversity, transportation and logistics networks and presence of competitive production and service industries (Kreslins K., Stefenberga D., 2016).

In 2014, Vidzeme planning region developed their research study "Smart specialization Possibilities of Vidzeme Planning Region" (2014). During the research, there were set three strategic goals: to promote high value added production in traditional branches of the regions; to diversify economy of the region by developing entrepreneurship in the existing specialization areas and development of new forms of entrepreneurship in knowledge economy branches.

The smart specialisation development in the EU

The reason of smart specialization strategy implementation in the EU was the economic crisis, which wiped out years of economic and social progress and exposed structural weaknesses in Europe's economy. Economy should regenerate and pass a new development level. So, smart specialization strategy will help Europe to come out stronger from the crisis and turn the EU into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion (EUROPE 2020: A European ..., 2010). EU 2020 targets are presented in Table 1.

Table 1

**Europe 2020 target evaluation
(2014-2015)**

| Target value (2020) | Year 2014 | Year 2015 | Progress |
|--|-----------|-----------|----------|
| Share of the employed population aged 20-64 be (%) | | | |
| 75 | 69.2 | 70.1 | 93.5 % |
| Share of the EU's GDP invested in Research and Development (%) | | | |
| 3 | 2.04 | 2.03 | 67.7 % |
| The "20/20/20" climate/energy targets: | | | |
| 1.Greenhouse gas emissions' decrease, base year 1990 (%) | | | |
| -20 | -22.94 | - | 114.7 % |
| 2.Share of renewable energy in gross final energy consumption (%): | | | |
| 20 | 16.0 | - | 80 % |
| 3.Primary energy consumption (%): | | | |
| 20 | 15.7 | - | 78.5 % |
| The share of early school leavers (%) | | | |
| <10 | 11.2 | 11.0 | 90.9 % |
| The share of the younger generation with a tertiary degree (%) | | | |
| >40 | 37.9 | 38.7 | 96.8 % |
| Share of people at risk of poverty in total population (%) | | | |
| 20 | 24.4. | 23.7 | 84.4 % |

Source: authors' calculation based on EUROPE 2020: A European ..., 2010; EUROSTAT Database

To achieve these targets, the European Commission proposes that EU goals should be translated into national targets and trajectories and monitored in the EU Member States.

The three Baltic States have made the most progress to the EU targets. They increased their score by more than 10 index points. Their improvement on all fronts is impressive. Their employment rates increased by four to five percentage points.

R&D increased in all three, but especially in Estonia. Early school leavers dropped and tertiary education increased. Poverty or social exclusion rates remained below the EU target in Estonia, while Latvia and Lithuania made substantial progress towards the EU target. The share of renewable energy in electricity consumed increased, but GHG emissions also increased.

However, these targets are more representative. As described Mccann and Ortega-Argiles (2013), smart development is not a one-size-fits-all concept and its application requires embedding the various initiatives in the broader multilevel governance of each region context.

The European Commission, based on the analysis of regional features and innovation potential, recommends the EU Member States for developing smart specialization strategy for innovation promotion to adopt one of these development strategies:

- building on current advantages (science push/technology-led or a mix);
- supporting socio-economic transformation (reconversion or identification of a new frontier);
- catching up: towards the creation of knowledge-based capabilities (Guide to Research ..., 2012).

The choice between these three strategies depends on region type and main strategy. As it is seen in Table 2, strategy which is based on building current advantages conform to region with knowledge and technology hubs, knowledge-intensive city/capital districts, scientific and technology intensive production regions and skill intensive regions. For skill intensive regions, as a main priority can be two strategies – building on current advantages and supporting socio-economic transformation (e.g. in Latvia). Regions with medium-tech manufacturing and service providers and structural inertia or de-industrialising regions should choose supporting socio-economic transformation as a main strategy. And the third strategy – catching-up: towards the creation of knowledge-based capabilities is suitable for traditional manufacturing regions, service-led and natural resource-based regions and primary sector intensive regions.

Innovation strategies for different types of region according to knowledge intensity of productive fabric

| Type of region | Main strategy | | |
|--|---|--|---|
| | Building on current advantages (science push/technology-led or a mix) | Supporting socio-economic transformation | Catching-up: Towards the creation of knowledge-based capabilities |
| Knowledge hubs | | | |
| Knowledge and technology hubs | ● | ○ | ○ |
| Knowledge-intensive city/capital districts | ● | ○ | ○ |
| Industrial production zones | | | |
| Scientific and technology intensive production regions | ● | ○ | ○ |
| Skill intensive regions | ● | ● | ○ |
| Medium-tech manufacturing and service providers | ○ | ● | ○ |
| Traditional manufacturing regions | ○ | ○ | ● |
| Non-scientific and technology-driven regional systems | | | |
| Service-led and natural resource-based regions | ○ | ○ | ● |
| Structural inertia or deindustrialising regions | ○ | ● | ○ |
| Primary sector intensive regions | ○ | ○ | ● |

Legend: ● main priority; ○ strategic choice; ○ low priority

Source: (Guide to Research ..., 2012)

The smart specialisation strategies in Latvia, Lithuania and Estonia.

All Baltic States have signed memorandum of Understanding on Closer Co-operation in Higher Education, Research and Innovation (2012). The purpose of this Memorandum is to strengthen the cooperation of the Parties in developing coordinated research and development policy and fostering innovation, in particular to meet the conditionality recommendations of the European Union for the next financial planning period for EU structural funds in 2014 – 2020. One of the tasks include supporting actions aiming to coordinate and create a basis for constant exchange of information on research, technology transfer and innovative industries in areas of smart specialization of each country as well as identifying common priorities and areas of synergetic cooperation.

Latvia has chosen strategy supporting socio-economic transformation foreseeing science and technology caused growth and progress towards a knowledge-based capacity development. At the

same time, in smart specialization strategy of Latvia there are included elements from the other two strategies mentioned before (Informativais ziņojums "Par ..., 2013).

The reason of choosing such model in Latvia was the existing economic problems as mono-centric regional development, not enough science and research capacity, existing education system did not match demand and supply of labour, weak cooperation between industry and science and prevalent business model of Latvian companies is not oriented toward innovation but on cheap labour and exploiting natural resources (Kiopa, 2014).

The task of smart specialization strategy in Latvia is to provide highlighting developing priorities and regular reviewing, targeted investment focusing, including strategy settings appropriate policy instrument selection and monitoring system development, which are aimed at Latvia competitiveness strengthening in regional, European and world level. Therefore, there are detected three transformation

directions of smart specialization in Latvia and such priorities:

- structural changes of production and export in the traditional sectors of the economy (products with high added value);
- growth in sectors where there is or is likely to create products and services with high added value (productive innovation system);
- sectors with significant horizontal impact and contribution to economic transformation (energy efficiency, advanced information communication technologies, advanced education system, knowledge base and human capital and polycentric development) (Informativais zinojums "Par ..., 2013).

Smart specialization strategy in Latvia provides development of human capital by attracting young scientists, avoiding fragmentation of resources and supporting cooperation programs (internationalization of science). Closer integration of education, science and industry sectors provides facilitate technology transfer via attraction of technology transfer experts in universities and introducing new transfer services, better linkages with instruments oriented to support creation of new businesses, continue to develop Competence Centres, especially in specialization areas, as long-term collaboration platforms between industry and academia and coordination platform among industry players themselves and support for development of technology transfer infrastructure (open labs, prototyping labs, living labs) in universities and research organizations. To develop building innovation capacity of industry, it is important to create new tax relief to support industry investments in R&D, to support development of enterprises, especially newly established businesses formed on the basis of research results, to support business with fast growth potential via early stage investment instruments and to support non-technological innovation and creative industries (Informativais zinojums "Par ..., 2013).

About smart specialization strategy status in Latvia – it has a national policy status; it is accepted by the Cabinet of Ministers by creating implementing plan and executing a monitoring system. The governance institutions responsible for smart specialization strategy design and implementation process are the Ministry of Education and Science and the Ministry of Economics. But Latvian Research and Innovation Strategic Council chaired by Prime Minister is responsible for strategic tasks (Kiopa, 2014).

Estonia emphasizes that the problem of their economy is that its productivity is lower than in west European countries – people in Estonia works hard but add less value per hour than people doing the same work in some other European countries. As explained by K. Lepik form Estonian Development Fund: "Estonia must move up in the production chain and concentrate more on innovation and development" (Smart Specialisation – Qualitative..., 2013).

The activity areas of Estonian economy are producing higher added value, to be export-intensive and characterized by large volumes of foreign trade and having a high rate of employment. A quantitative analysis of smart specialisation process in Estonia identified eight areas in which country currently has the highest economic potential – information and communications technology (ICT), health technology and health services, mechanical engineering, logistics, chemical products, innovative house-building (wooden houses), timber enhancement (doors, windows, furniture, design, cellulose, paper and cardboard) and functional food.

There were selected three important global trends as growth areas, in which Estonia's potential for cooperation between enterprise and research was strongest.

- 1) Information and communications technology (ICT) via other sectors – this sector may be considered as the sector with the highest potential for Estonia. There are highlighted

three sub-sectors (use of ICT industry, cyber security, software development) with a condition that the support may also be given to other sectors that cross paths with ICT.

- 2) Health technology and services – they have the greatest potential in such sub-sectors – biotechnology and e-medicine (use of IT for the development of medical services and products).
- 3) More efficient use of resources with three sub-sectors – materials science and industry, development of the "smart house" concept, food that supports health.

In addition, Estonians emphasize that growth areas should not be rigidly determined for a long period but they must be flexible (Smart Specialisation – Qualitative..., 2013).

In Estonia, the responsible ministries for the process of smart specialisation strategy development are the Ministry of Education and Research and the Ministry of Economic Affairs and Communications. Smart specialisation monitoring and analysis in Estonia are carried out by Estonian Development Fund.

Lithuanian economy has shown the necessity for economic transformation, which means

structural change that leads to growth of economic activities characterised by high productivity knowledge and human capital intensity. It is necessary to lead to closer collaboration and to formation of the critical mass of business and research representatives whose joint work would bring systemic changes and lead to higher competitiveness.

After discussions of expert groups and surveys, Lithuania proposed six priority areas of smart specialisation which are energy and sustainable development, health technologies and biotechnologies, new production processes, materials and technologies, transport, logistics and ICT and inclusive and creative society. Expert groups consisted of representatives from research, business, non-governmental and governmental sectors to get the most objective view. As a whole they proposed 20 priorities to promote experimentation and entrepreneurial discovery and providing strong monitoring system it is planned to terminated the "unsuccessful" priorities (Identification of Specific... , 2013).

Summary of smart specialisation priorities of all three Baltic States is shown in Table 3.

Table 3

Smart specialisation priorities of Latvia, Lithuania and Estonia

| No. | Latvia | Lithuania | Estonia |
|-----|--|---|---|
| 1. | ICT | ICT (technologies for developing advanced e-content and information interoperability) | ICT |
| 2. | Biomedicine, medical technologies, biopharmacy and biotechnologies | Intelligent applied technologies for personal and public health | Health technology and health services |
| | | Biotechnologies and biopharmacy | Chemical products |
| | | Advanced medical engineering for early diagnostics and treatment | |
| 3. | Advanced materials, technologies and engineering systems | New production processes, materials and technologies | Mechanical engineering |
| | | | Innovative house-building (wooden houses), timber enhancement |
| 4. | Smart energy | Smart and efficient energy and sustainable environment | - |
| 5. | Knowledge-based bio-economics | Safer and functional food, agro-innovation | Functional food |
| 6. | - | Transport and logistics | Logistics |
| 7. | - | Inclusive and creative society | - |

Source: authors' construction

Information and communication technologies is the common priority of all three Baltic states. Other common priorities have some differences depending on state planned economy development direction. In area of biomedicine, Latvia has a wide focus on this area, Estonia is more focused on health technology, health services and chemical products but Lithuania focuses also on medical engineering for early diagnostics.

In area of materials, technologies and engineering Estonia has just two directions – mechanical engineering and wooden materials using for innovative house-building and timber enhancement. Latvia and Lithuania have defined this area more generally as advanced materials, technologies and new production processes.

Smart energy as a priority has been proposed just by Latvia and Lithuania, where Lithuania also has included sustainable environment.

Lithuania and Estonia have thought more about functional food, while Latvia has nominated a broader concept – knowledge based bio-economics.

Logistics as a priority has been detected just by Lithuania and Estonia; Lithuania has also enclosed smart transport systems.

Lithuania is the only country of the Baltic States which has set inclusive and creative society area as a priority with modern learning technologies and processes and technologies and processes for breakthrough innovation.

Conclusions, proposals, recommendations

- 1) Each EU country has developed its own smart specialisation direction but with a common aim to improve certain economic indicators in the whole EU.
- 2) Most of Europa 2020 targets since 2014 have improved, the slowest progress of targets is related to GDP investment in Research and Development - in 2015 it reached just 67.7 % of target value.

- 3) The three Baltic States have made the most progress to the EU targets by more than 10 index points. R&D increased in all the three countries, but especially in Estonia. Early school leavers dropped and tertiary education increased. Poverty or social exclusion rates remained below the EU target in Estonia, while Latvia and Lithuania made substantial progress towards the EU target. The share of renewable energy in electricity consumed increased, but GHG emissions also increased.
- 4) Several researchers about smart specialization emphasize that regions and countries respond differently to investments and innovation, each region should find synergy and links between new development areas based on local known by diversifying the existing specialisation.
- 5) Comparing smart specialisation priorities in the Baltic States, most priority areas largely coincide but some priorities have been proposed just by one or two countries. Latvia has proposed wide area priorities; Lithuanians have divided even 20 priorities but Estonians have defined their priorities very laconic.
- 6) Information and communication technologies are the common priority of all the three Baltic States. Smart energy as a priority has been proposed just by Latvia and Lithuania, Lithuania and Estonia have thought more about functional food, also the logistics as a priority have been detected just by Lithuania and Estonia.
- 7) Lithuania is the only country of the Baltic States which has set inclusive and creative society area with modern learning technologies and processes and technologies and processes for breakthrough innovation as a priority.

Acknowledgement

The research was supported by project "Strengthening Research Capacity in the Latvia University of Agriculture" (agreement No 3.2.-10/43).

Bibliography

1. *EUROPE 2020: A European strategy for smart, sustainable and inclusive growth*. (2010). Retrieved: [http://ec.europa.eu/eu2020/pdf/COMPLET %20EN %20BARROSO %20 %20 %20007 %20-%20Europe %202020 %20- %20EN %20version.pdf](http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf) Access: 10.12.2016.
2. *EUROSTAT Database*. Retrieved: <http://ec.europa.eu/eurostat/data/database> Access: 17.12.2016.
3. *Guide to Research and Innovation Strategies for Smart Specializations (RIS 3)*. (2012). Retrieved: http://ec.europa.eu/regional_policy/sources/docgener/presenta/smart_specialization/smart_ris3_2012.pdf Access: 15.12.2016.
4. Gulc, A. (2015). Analysis of Methodological Approach to Identify Smart Specialization on the Example of Polish Regions. *Procedia - Social and Behavioral Sciences*, 213, pp. 817–823.
5. Informatīvais ziņojums "Par viedas specializācijas stratēģijas izstrādi" (Development of a Smart Specialization Strategy for Latvia: informative report). (2013). Retrieved: <http://tap.mk.gov.lv/mk/tap/?pid=40291636> Access: 13.12.2016.
6. *Identification of Specific R&D&I Priorities in Lithuania*. Proposals for RDI Priorities. (2013). Retrieved: http://s3platform.jrc.ec.europa.eu/documents/20182/89682/Proposals_for_Smart_specialization_Lithuania.pdf/62c77005-c818-47bd-afba-6add66413a80 Access: 03.01.2017.
7. Jucevicius, R., Galbuogiene, A. (2014). Smart Specialization: Towards the Potential Application of the Concept for the Local Development. *Procedia - Social and Behavioral Sciences*, 156, pp. 141–145.
8. Kiopa A. (2015). *Governance of the implementation of Smart Specialization Strategies: Case of Latvia*. Ministry of Education and Science Republic of Latvia. Retrieved: [http://wire2015.eu/assets/upload/userfiles/files/spiikeru %20prezentaacijas/Agrita_Kiopa_RIS3__WIRE_04062015 .pdf](http://wire2015.eu/assets/upload/userfiles/files/spiikeru%20prezentaacijas/Agrita_Kiopa_RIS3__WIRE_04062015.pdf) Access: 07.12.2016.
9. Kiopa A. (2014) *LATVIA: Policy mix and implementation of the RIS3*. Ministry of Education and Science Republic of Latvia. Retrieved: <http://s3platform.jrc.ec.europa.eu/regions/LV?s3pv=5> Access: 07.12.2016.
10. Kreslins, K., Stefenberga, D. (2016). Analysis of Kurzeme Region Development in the Context of Smart Specialization Strategy: Preliminary results. *Engineering for Rural Development*, Volume 15, pp. 1224–1229.
11. Mccann, P., Ortega-Argiles, R. (2013). Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy. *Regional Studies*, Volume 49 (8), pp.1291-1302.
12. Naldi, L., Nilsson, P., Westlund, H., Wixe, S. (2015). What is Smart Rural Development? *Journal of Rural Studies*, 40, pp. 90–101.
13. Paliokaite, A., Martinaitis, Z., Reimeris, R. (2015). Foresight Methods for Smart Specialization Strategy Development in Lithuania, *Technological Forecasting and Social Change*, 101, pp. 185–199.
14. Pelse, M., Lesevica, M. (2016). Smart Specialization Assessment in Latvia. *Economic Science for Rural Development*. Volume 42, pp.126-131.
15. Petījums "Vidzemes planosanas reģiona viedas specializācijas iespējas" (Research study "Smart Specialization Possibilities of Vidzeme Planning Region"). (2014). Retrieved: http://www.vidzeme.lv/lv/petijums_vidzemes_planosanas_reģiona_viedas_specializācijas_iespejas/ Access: 08.12.2016.
16. *Smart Specialisation – Qualitative Analysis*. (2013). Estonian Development Fund. Retrieved: http://www.arengufond.ee/wp-content/uploads/2013/04/Estonia_Smart_Specialisation_Qualitative_Analysis.pdf Access: 03.01.2017.

WORK BASED LEARNING PROGRAMMES IN LATVIA

Liene Golca¹, Mg.soc.sc; Feliciana Rajevska², Dr.pol.sc.

^{1,2} Vidzeme University of Applied Sciences, HESPI

Abstract. Work based learning (WBL) is referred to as a high-level education and employment policy priority in the European Union (EU), including Latvia. In the context of Latvia, WBL means that a student of a vocational school during the programme of WBL acquires theory and practice of vocational content of education programme in an education institution and in a company according to the individual plan of the appropriate education programme. WBL as an educational approach in vocational education in Latvia was launched in 2013 in the form of pilot projects, in 2015 it was included in the regulations as a form of education acquisition, and in summer 2016 it was adopted by the regulation of the Cabinet of Ministers. The goal of the article is to investigate the complicated road to the introduction of WBL in Latvia. Therefore, the tasks include a detailed analysis of the experience of stakeholders in WBL implementation process, mainly focusing on awareness-raising and communication experience of WBL implementers. The article is based on the analysis of legislative acts, reports from the ministries and interviews with stakeholders (10 interviews were conducted). Results show that in WBL pilot stage there has been a quite varied school awareness and interpretation of what WBL is and how to implement it within the existing legislative framework- this has contributed to the emergence of different experiences. Furthermore, the lack of experience in the implementation of the WBL approach and the school competition are some of the reasons influencing the communication among schools.

Key words: work based learning, vocational education, policy implementation.

JEL code: H5

Introduction

"To create one of the best education systems in the EU and to become one of the leaders in adult education in terms of access and use", such objective has been defined in the sustainable development strategy "Latvia 2030", which is hierarchically the highest long-term development planning document in Latvia (Saeima, 2010). Also current government's priorities include an ambitious goal: "The system of education in Latvia should provide school-leavers with modern skills and competencies in high added value national economy and a successful life in a knowledge-based society" (Declaration of the Intended..., 2016). According to the decision of the Ministry of Education and Science (MES) in 2013, six vocational educational institutions in Latvia (Ventspils Technical College, Riga State Technical School, Valmiera Vocational School, Ogres Technical College, Jelgava Technical College, Jelgava Crafts Secondary School) started pilot projects of work based learning (MES, 2014). The aim of these pilot projects was to define how WBL might look in Latvia (Liepina, 2013.). The MES sets a long-term objective to implement WBL approach at a system level (as

one of the approaches), in parallel promoting the change of thinking (paradigms) for the stakeholders involved in the implementation of vocational education, including the public administration level (MES,2014). Although the first WBL pilot projects were implemented in 2013, the Cabinet Regulation on how to implement WBL was adopted only in 2016.

The implementation process of WBL in Latvia is followed also by EU institutions, which provide recommendations regarding the WBL implementation process and each year analyse how the Member State has implemented the specific recommendations. Concerning WBL, its development since 2014 has been assessed as having some progress, which means that the Member State has announced or adopted measures to address the country specific recommendation. These measures are promising, but not all of them have been implemented yet and the implementation is not certain in all cases. The reports indicated that while implementing WBL in Latvia, there was a limited number of large enterprises, and finding ways of involving them in WBL provision was needed (European Commission 2014). The quality of WBL and apprenticeship type schemes, especially in

¹ Corresponding author. E-mail address: liene.golca@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 28319532

² Corresponding author. E-mail address: Feliciana.Rajevska@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 29177728

technology and engineering remains a challenge. It will also need to finalise the secondary legislation on work based learning and formalised involvement of sectorial councils. Motivating companies to provide quality WBL placements remains problematic (European Commission, 2015). A clear and consistent legislative framework is not in place. The main characteristics of work based learning are not specified, and further uncertainties remain, especially in relation to the pay and status of the student as well as organisational aspects. Motivating companies to provide quality WBL and practical training placements is problematic. The government has analysed the possible options (lower minimum wages for apprentices, tax reliefs, stipends) to provide financial support for employers taking on an apprentice or a trainee, but decisions have not been made yet (European Commission, 2016).

It can be concluded that WBL policy implementation is still in its initial stage. Thus, monitoring and assessment is important in order to follow the policy development and to summarize the experience on its quality. Thereby, the goal of the article is to investigate the complicated road to the introduction of work based learning in Latvia. The tasks include a detailed analysis of steps towards introduction of WBL realized by stakeholders. It should be noted that the article novelty lies in the fact that it mainly reveals the policy implementers' thoughts and experiences.

The article is based on the analysis of legislative acts, reports from the ministries and interviews with the representatives of vocational schools, representatives of the companies and organizations which were involved in WBL policy planning and implementation. During the research, there were vocational education institutions and companies who were ready to share their experience and information, but did not want their name to be mentioned in the research. Therefore, all the organizations

interviewed were coded, for example, "School A" or "Company A" etc.

Work based learning – the term and its content

European Training Foundation (ETF) has made an in-depth examination of the literature on WBL. During the literature studies, they have found that there is no single definition of what WBL entails. Besides that, the term WBL cannot be clearly distinguished from other terms used to refer to practice-based learning in a work context; several close (and interchangeable) synonyms are found in the literature, including employment-based learning, on-the-job training, enterprise-based learning and, in some contexts, workplace learning. The boundaries between these different forms of learning are often blurred and the level of regulation and the extent to which they include a theoretical component varies.

ETF concluded in their study that there are narrow and broad definitions of WBL. Some definitions say that WBL is learning that takes place in a real working environment through participation in the work process, irrespective of whether the learners are young people, students, unemployed people or employees, or whether they are paid or unpaid. Some definitions go further and also encompass some forms of classroom-based learning (WBL learning: benefits and obstacles simulations, virtual firms) or see WBL as a component of a broader learning programme that also includes theoretical lessons and classroom learning (ETF, 2013). The European Centre for the Development of Vocational Training (CEDEFOP) defines WBL as "acquisition of knowledge and skills through carrying out – and reflecting on – tasks in a vocational context, either at the workplace (such as alterance training) or in a VET (vocational educational training) institution" (CEDEFOP, 2014).

In addition, the European Commission has made a great source called „WBL in Europe –

¹ Corresponding author. E-mail address: liene.golca@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 28319532

² Corresponding author. E-mail address: Feliciana.Rajevska@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 29177728

Practices and Policy Pointers". This document is like a policy guidelines illustrated by particular practices from the Member States, which can be used by policymakers and practitioners to introduce or reinforce work based learning elements in vocational education and training. According to this document, WBL is a fundamental aspect of vocational training – it is directly linked to the mission of VET to help learners acquire knowledge, skills and competences which are essential in working life. This document identifies three main models of WBL.

1) Alternance schemes or apprenticeships are typically known in Austria and Germany as the "dual system". This model is based on the integration of companies as providers of training together with VET schools. In parallel, or in "alternating" periods, students acquire general and occupation-related knowledge and often complementary practical skills and key competences in VET schools. Alternance and apprenticeship are characterised by high intensity or frequency of work integration or real-life work situations. Countries with strong apprenticeship systems report very good results in terms of young people's transition to employment (European Commission, 2013), and this is one of the reasons why many other countries want to transfer this kind of WBL model or some elements of it to their educational systems. For example, Germany, in the context of Development Cooperation, has transferred the dual model to other countries for decades, while Austria has only recently started to support the transfer of the dual system as a part of its development cooperation strategy (Langthaler, 2015). Also in the case of Latvia, Declaration of Intent on Latvian and German Cooperation in Vocational Training was signed between the Minister of Education and Science Dombrovskis and the German Ambassador in Latvia A. Quiz in July 2013. It was pointed out that the Declaration

provides a variety of Latvian-German cooperation in the field of vocational training, including counsellors in German-Baltic Chamber of Commerce in Riga who should support the dual education pilot project for three years (Joint Declaration of Intent, 2013).

Professor D. Euler in his research "Germany's dual vocational training system: a model for other countries?" writes that any country wishing to import a foreign system of vocational training must take the existing framework conditions into consideration and implement the dual vocational training in line with the country's own educational, social and economic objectives. Thus, the objective should be to prudently import adapted elements of another country's system, but not an exact copy of it. After analysing the literature and the relevant legal sources, he identified and discussed eleven essential elements of the dual system and made discussion of their potential benefits for other countries and possible approaches to exporting a modified version of the system (Euler, 2013). There is also a research on the transfer of the Austrian dual system of vocational education to transition and developing countries.

This research examines the status quo of the transfer trend as well as key players, funding possibilities, approaches, lessons of experience and challenges. The paper concludes that while current transfer activities respond well to several criteria set out by the Austrian Development Cooperation, a number of open questions remain as to sustainability, systemic effect and economic bias, among others (Langthaler, 2015).

2) Going back to the European Commission models of WBL, next or the second WBL model is school-based vocational educational training, which includes on-the-job training periods in companies. On-the-job training periods typically cover internships, work placements or traineeships that are incorporated as a compulsory or optional

¹ Corresponding author. E-mail address: liene.golca@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 28319532

² Corresponding author. E-mail address: Feliciana.Rajevska@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 29177728

element of VET programmes leading to formal qualifications. They can be of varying duration, but typically represent less than 50 % of the training programme duration (European Commission, 2013).

- 3) The third WBL model is integrated in a school-based programme, through on-site labs, workshops, kitchens, restaurants, junior or practice firms, simulations or real business/industry project assignments.

Many countries in Europe combine these three general models of WBL. Terminology and definitions vary, and even a single term such as "apprenticeship" may have different connotations and underlying concepts. Clear statistical data on WBL is therefore not easy to locate (European Commission, 2013).

Work based learning- the situation in Latvia- description and analysis

To find out the experience of Latvia in WBL implementation, 10 interviews with stakeholders were conducted. As already mentioned, WBL started in Latvia with the help of pilot projects. According to the literature, pilot projects are mainly used to introduce or test new approaches, ideas or technologies. They are used in the context of policies and management to apply and adopt innovation in a real environment, and often they are put in place to ensure policy agenda with knowledge on the concept to be tested. This makes pilot projects as policy tools a perfect platform for many ideas and policies (Vreugdenhil, Frantzeskaki, Taljaard, Rault, Slinger, 2009:1). Pilot projects give knowledge that can be used for improvement of technology or concept, and provide evidence for a specific policy, thus legitimizing the further implementation of this policy (Vreugdenhil, Slinger, 2008:1). In the video published by the MES in 2013, "Implementation of WBL in Latvia's vocational education" the MES State Secretary S. Liepina stated that "the aim of MES is to define how WBL could look like in Latvia" (Liepina, 2013). According to this statement, the pilot

projects introducing work based learning were undertaken not to test a previously developed WBL approach, but to define how it should look like in the Latvian context. Namely, this learning approach and the respective policy was only developing during the implementation of the pilot projects, contrary to what was indicated in the sources that the pilot projects are mainly used "to test a new approach which implemented in the context of pilot projects reveal the improvements needed" (Vreugdenhil, Slinger, 2008:1).

During the interviews, it was essential to find out how the approach practitioners developed an understanding of this teaching approach in order to implement something it first requires to get an understanding of it. According to the School B, "It was in the context of seminars. MES employees, officials had visits abroad, organized a seminar, invited directors, told about this experience; so let's make a pilot project, we should also try to adopt this." (Golca, 2016).

The State Secretary at the MES Liepina indicates that the pilot project will be defined within the framework of this training approach and the resulting policy. However, schools and companies starting the pilot projects were expecting some minimum criteria and principles to implement in these pilot projects and the way to implement them. In the public space, there are no documents – in the form of guidelines, recommendations or other documents – for the process of pilot projects on how this new learning should be carried out in addition to the current regulatory framework. There was no separate legal regulation at that moment regarding the implementation of WBL. When asked whether the MES had set any criteria or standards to be implemented as a minimum requirement within the pilot projects that describe the WBL approach, the representative of the School A pointed out "No, at that time nobody had understanding on how to better implement the dual education, we progressed according to our

¹ Corresponding author. E-mail address: liene.golca@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 28319532

² Corresponding author. E-mail address: Feliciana.Rajevska@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 29177728

own understanding." (Golca, 2016); "I already told you I did not know, but I swam with the stream, I said let's do it, I did not know how to implement it." (School D in Golca, 2016). Most part of the schools had to figure out themselves how to implement this, "they tossed us a bone, and schools had to solve this, and the schools tried to implement it according to their competence and possibilities." (School B in Golca, 2016). In interviews, the representatives of the educational institutions pointed out that there was a lack of advice: "No advice comes from them (MES) on how to do it better, how to implement it, there was and there is no conceptual approach to how we should work." (School A in Golca, 2016). In interviews, a reference was made to the lack of clarity in the implementation of the pilot projects: "There is no clear definition, there is no understanding about all this ... no policy perspective where I shall not get involved, I think that there is also a lack of the experience, understanding of what is necessary and required." (Organization A, in Golca, 2016).

In 2015, Ltd. "Survey Centre" published a study WBL for the development of vocational education in Latvia" on the basis of self-assessment questionnaires of educational institutions. One of the conclusions was that" some educational institutions do not separate WBL from the practical internship of students (..) there is a need for a precise definition of WBL process, and on the other hand, interpretative work with both educational institutions and the employers on the essence, conditions and legal aspects of WBL process is necessary. (Survey Centre, 2015:7).

Moreover, during the interviews, the participants pointed to the situation described in the study that there is a diverse understanding among schools, everybody implements it as they understand, one school implements within 1.5 year programme, another in 4 year programme, one uses European Social Fund projects for the

realisation of the pilot project, another uses state funding programme (Golca, 2016), it can also be seen that some schools involved in the pilot projects consider internships to be WBL implementation (School C, A and D in Golca, 2016).

Already in 2012, the representative of Latvian Employers' Confederation (LEC) after her visit to Germany said that she had "heard that the German dual vocational training system is something good and successful and that it should be introduced in Latvia, then all the problems associated with the education of skilled labour would be solved. It is important to understand, so we do not follow a name or a brand, not fully understanding what it is exactly we want to introduce / adopt / upgrade." (Lice, 13.04.2012). In the study of the researchers Hogwood and Gunn, we can read that in order to successfully implement a policy, a full understanding of it among the persons involved is important, as well as the agreement and clear objectives (Hogwood, Gunn, 1984:204). Of the situation described it follows that the understanding on how to implement this learning approach has been problematic, mainly schools themselves have shaped their understanding and respectively their interpretation of the ways to implement this learning within the pilot projects. The development of the understanding was promoted also by exchange visits, which were additionally organized by individual schools with the financial support from companies.

In order to perfectly introduce a policy, one of the aspects is the existence of perfect communication and coordination (Hogwood, Gunn, 1984). During the interviews, the schools were asked a question: "How much do you as schools communicate and consult with each other?" School A describes the existing experience: "We do not consult each other directly, mostly we meet at seminars, conferences where we share our experiences on all of this what happens in Latvia, and we take

¹ Corresponding author. E-mail address: liene.golca@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 28319532

² Corresponding author. E-mail address: Feliciana.Rajevska@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 29177728

over some new ideas from colleagues, if you are interested in the idea in a conference, then you approach the presenter and ask him or her." (Golca, 2016). The representative of the school B agrees mentioning the possible cause for the lack of communication – the unhealthy competition among schools that promotes isolation and reduces communication, including on WBL: "A problem that is topical and will be even more crucial is the unhealthy competition among schools, the survival of the school, taking into account that the money follows a student it is a matter of survival, then we keep distance, we are on our own, this is it, we would need to cooperate since we do the same job, but this travelling of young people, the number of students has created such a situation and at that moment we consult the MES." (Golca, 2016). The previous lack of experience is also mentioned as the reason for low communication among schools: "Since we were the ones who began, mostly we consulted with the MES, there was nobody to call, there was simply no such experience." (School B in Golca, 2016). Some interview participants stressed the feeling that educational institutions have been left alone with the policy-making and implementation (School A and B): "This is a problem, yes, a communication problem, because I had an impression at one moment that the school is on its own, if you can make it, you do it." (School B in Golca, 2016).

During the interviews, a question on the communication between educational institutions and companies was also asked. This communication can be evaluated in each case individually, it manifested itself in a different way in each case, there are examples where the communication between the school and the company has been assessed as positive (School A and C). There are cases where the company indicates some problems: "The direct communication with the school is pretty bad, they are confusing the dates, they feel that it does not matter that they have promised

students will be there in the first week, but they come in the second, or they communicate that students will have three days of practice for six months, then they tell us, sorry, we made a mistake - they will have two days for the next six months, if it was not for German- Baltic Chamber of Commerce between us it would be pretty hard to communicate directly with the school." (Company C in Golca, 2016).

It has to be mentioned that there is a large number of stakeholders involved in the implementation process of WBL - most ministries, vocational education institutions, companies, employers' associations etc., a full list of the involved institutions can be found in the MES report (MES, 2014). During the study, it was concluded that the massive number of organizations, as well as their positions impacted (in this case hindered) the adoption of laws and regulations. On 28 January 2016, during the State Secretaries' meeting draft regulations "Procedure for organization and implementation of work based learning" were presented. The State Secretaries' Meeting decided that "MES draft regulations and annotation should be approved by the Ministries of Justice, Finance, Economics, Welfare, Health, Environment and Regional Development, Cross-Sectoral Coordination Centre, the State Chancellery, Latvian Association of Local Governments, Latvian Free Trade Union Confederation, the Latvian Employers' Confederation, and the agreed project to be submitted to the State Chancellery (Minutes of State Secretaries', 2016). The project of the Cabinet Regulations was approved almost six months later, or on 15 July 2016, following its submission to the State Secretaries' meeting (Cabinet of Ministers, 2016).

According to the literature (Hogwood, Gunn, 1984), any reform or activity to be successfully implemented requires resources – financial, human, knowledge etc. resources. From the interviews it can be concluded that the schools did not receive additional funding in the form of

¹ Corresponding author. E-mail address: liene.golca@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 28319532

² Corresponding author. E-mail address: Feliciana.Rajevska@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 29177728

pilot projects, not even to cover administrative costs (School A and B in Golca, 2016). According to currently available information, in the framework of the specific supported objective (SSO 8.5.1.) "Increasing the number of qualified vocational education institution students after their participation in WBL or an internship in a company" WBL programme will be supported. Total financing for SAM activities by 2023 is nearly 22 million EUR (of which 18,646,580 euros from the European Social Fund) (Latvian Employers' Confederation 2016). There was a diversity of views in the interviews in relation to this specific funding in the framework of the specific support objective, of which the biggest part of the funds are allocated from the European Social Fund. Entrepreneurs involved in WBL programme implementation assess it positively, because within this SSO entrepreneurs will be able to receive compensation for the participation in WBL. A more cautious view on these financial resources is expressed by the organization involved in WBL policy development and implementation as well as representatives of school A, pointing out that sustainability has to be considered, since this financial support is provided only until 2023 (Golca, 2016).

Conclusions, proposals, recommendations

1) In WBL pilot stage, there has been a quite varied school interpretation of what work based learning is and how to implement it

within the existing legislative framework; this has contributed to the emergence of different experiences.

- 2) The lack of experience in the implementation of the WBL approach and the school competition are some of the reasons influencing the communication among schools. In order for schools to have a more active daily sharing of experience and jointly find new ideas for the implementation of WBL, the Ministry of Education and Science should be more active in organizing all stakeholders' experience exploration, exchange and further promotion to the general public.
- 3) Although the initial stages of WBL development in Latvia seemed stagnant, in 2016 a lot has been done - implementing rules have been approved, funding is available. The responsible institutions already now should come up with proposals and / or vision on how WBL could be developed after the end of funding available within the specific support objective in 2023.
- 4) There are concerns regarding WBL sustainability. For many stakeholders to be able to agree on the future development of WBL, an interest and opinion agreement mechanism should be developed, as well as greater support for policy development directly from the political level (ministers) is required, not leaving the policy in the hands of public officials

Bibliography

1. Cabinet of Ministers (2016). Legislative Proposals (Tiesibu aktu projekti). Retrieved: <http://tap.mk.gov.lv/lv/mk/tap/?pid=40380892> Access: 27.12.2016.
2. CEDEFOP (2014). Terminology of European Education and Training Policy. Luxembourg: Publications office of the European Union.
3. Council of European Union (2012). Council Recommendation on the National Reform Programme 2012 of Latvia Available: <http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2011261%202012%20INIT>
4. Declaration of the Intended Activities of the Cabinet of Ministers Headed by Maris Kucinskis (2016). Retrieved: http://www.pkc.gov.lv/images/vald%20%C4%ABbas_deklar%C4%81cijas/2016/20160210_MKucinskis_Deklaracija.pdf
5. ETF- European Training Foundation (2013). Work-based Learning: Benefits and Obstacles a Literature Review for Policy Makers and Social Partners in ETF Partner Countries. Available: [http://www.etf.europa.eu/webatt.nsf/0/576199725ED683BBC1257BE8005DCF99/\\$file/Work-based%20learning_Literature%20review.pdf](http://www.etf.europa.eu/webatt.nsf/0/576199725ED683BBC1257BE8005DCF99/$file/Work-based%20learning_Literature%20review.pdf)
6. Euler, D. (2013). Germany's Dual Vocational Training System: a Model for Other Countries? Retrieved: https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/GP_Germanys_dual_vocational_training_system.pdf

¹ Corresponding author. E-mail address: liene.golca@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 28319532

² Corresponding author. E-mail address: Feliciana.Rajevska@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 29177728

7. European Commission (2013). Work-Based Learning in Europe. Practices and Policy Pointers. Retrieved: http://ec.europa.eu/dgs/education_culture/repository/education/policy/vocational-policy/doc/alliance/work-based-learning-in-europe_en.pdf
8. Golca, L. (2016). Work Based Learning Policy Making and Implementation in Latvia (Darba vide balstītu mācību politikas veidošana un ieviešana Latvijā). Master thesis. Vidzeme University of Applied Sciences.
9. Hogwood, B., Gunn, L. (1984). Policy Analysis for the Real World, Oxford University Press, Oxford.
10. Joint Declaration of Intent between the Ministry of Education and Science of the Republic of Latvia and Federal Ministry of Education and Research of the Federal Republic of Germany (2013). Cooperation in the field of vocational education and training. Available: http://www.izm.gov.lv/images/starpresoru_ligumi/1-30-2.pdf
11. Langthaler, M. (2015). The Transfer of the Austrian Dual System of Vocational Education to Transition and Developing countries. An analysis from a developmental perspective. Retrieved: http://www.oefse.at/fileadmin/content/Downloads/Publikationen/Workingpaper/WP53_dual_system.pdf
13. Latvian Employers' Confederation (2016). Seminar about implementation of work based learning (Seminārs par darba vide balstītu mācību iestenošanu). Retrieved: http://www.izm.gov.lv/images/Erasmus/Prezent_%C4_%81cija_1902016_WBL_Balt_projekta_eksperti.pdf
14. Liepina, S. (29.11.2013.) WBL Implementation in Latvia (Darba vide balstītu mācību ieviešana). Retrieved: <https://www.youtube.com/watch?v=wsPu3Sb8pi4>
15. Lice, A., (13.04.2012.) The Dual Vocational Training System. Education and culture (Dualā profesionālās izglītības sistēma. Izglītība un kultūra). Retrieved: <http://www.izglitiba-kultura.lv/raksti/duala-profesionalas-izglitibas-sistema>.
16. MES-Ministry of Education and Sciences (2014). *About WBL implementation in Latvia* Available: <http://tap.mk.gov.lv/mk/tap/?pid=40319533>
17. Minutes of State Secretaries meeting No.4. (28.01.2016) (Valsts sekretāru sanāksmes protokols Nr. 4.). Retrieved: <http://tap.mk.gov.lv/mk/vsssanaksmes/saraksts/protokols/?protokols=2016-01-28> (skat.22.05.2016).
18. Saeima of the Republic of Latvia (2010). Sustainable Development Strategy of Latvia until 2030. Available: https://www.cbs.nl/NR/rdonlyres/B7A5865F-0D1B-42AE-A838-FBA4CA31674D/0/Latvia_2010.pdf
19. Survey Centre (2015). "Work Based Learning for Development of Vocational Education in Latvia". Retrieved: http://www.iddk.lv/wp-content/uploads/2016/07/petijums_dvbmacibu_istenosana_latvija_2015.pdf
20. Vreugdenhil, H., Frantzeskaki, N., Taljaard, S., Rault, F., Slinger, J. (2009). The Next Step in Policy Transitions: Diffusion of pilot projects. Retrieved: http://www.tbm.tudelft.nl/fileadmin/Faculteit/TBM/Over_de_Faculteit/Afdelingen/Afdeling_Multi_Actor_Systems/Sectie_Beleidsanalyse/Medewerkers/Niki_Frantzeskaki/doc/Vreugdenhil_Pilots_governaOnce_IRSPM09.pdf
21. Vreugdenhil, H., Slinger, J. (2008). Understanding Pilot Projects and Their Contribution to Floodplain Management. Retrieved: <https://ecpr.eu/Filestore/PaperProposal/1c5813f5-3722-473e-9f78-236e498f0578.pdf>

¹ Corresponding author. E-mail address: liene.golca@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 28319532

² Corresponding author. E-mail address: Feliciana.Rajevska@va.lv Vidzeme University of Applied Sciences HESPI, Tel.: + 317 29177728

CHANGES IN WASTE MANAGEMENT IN THE EU COUNTRIES

Barbara Golebiewska¹, PhD hab., prof. WULS

¹ Faculty of Economic Sciences, Warsaw University of Life Sciences, Poland

Abstract. The increasing quantity of waste results from increase in consumption, new manufacturing techniques and technologies. In general, the EU generates huge quantity of different types of waste. On average, more than 400 kg of municipal waste per capita is generated yearly in Europe. If we consider an issue of environmental pollution and sustainable development, there is a question to be asked if and how much of generated pollution the nature is able to "absorb" and neutralise. Nobody is able to establish limit values for environmental pollution including waste collection. It seems that the level in question has already been exceeded because of negative environmental impact. Therefore, there is an important question, how could we decrease production and consumption in order to generate lower quantity of waste or recycle them appropriately and use again. Changes in waste generation in the EU countries since 2000 to 2015 have been presented in the study. Legal regulations concerning waste management have been discussed. Attention has been paid to waste quantity per capita and level of waste recycling.

Key words: waste, recycling, environment, waste municipal.

JEL code: Q5, Q50

Introduction

Waste management in the era of rapid development of our civilization creates more and more problems. The sustainable development principle indicates that waste management should be focused on manufacturing as less waste as possible and its negative impact on the environment should be reduced as much as possible. Privitera stated that the centrality of food in waste reduction is the topic of discussion in terms of the social sustainability of food (Privitera D., 2016). Adverse changes in the nature indicate the need to maintain a balance in the management of the environment (Golebiewska B., 2015).

Waste management in a way to avoid negative impact on the environment is not the only problem, economic loss is another one. Increasing waste quantity results from increase in consumption, new manufacturing techniques and technologies. To a large extent the waste is dangerous for human beings and for natural environment that should be "managed" appropriately and this generates high cost. Yet, few decades ago the waste "production" level was low enough for the environment to neutralise it. In the first half of the XX century, no attention was paid to this problem because it actually did not exist. The economy, as Kociszewski states, considered as one of the nature subsystems,

indicates that there are absolute limits of nature tolerance (Kociszewski K., 2013). Nowadays, it is necessary to enhance activities necessary to decrease quantity of generated waste or to use them appropriately (recycling). Waste recovery should also be organized in a correct way.

European countries generate huge quantity of different waste types. On average, 444 kg of municipal waste per capita is generated yearly in Europe. The most of it is subject to recycling or composting and significantly less waste is transported to landfills (Waste..., 2016).

There is a very close relation between the quantity of waste we produce and our production and consumption patterns. The effect is enhanced by demographic changes causing increase in number of households resulting in increasing number of packaging units, batteries, many types of garden waste etc. Huge quantity of industrial waste, mining waste, construction and demolition waste, used electronic equipment, cars, plastic bags, sanitary waste and many, many other unnecessary things we dispose of. The waste management topic is very important and timely when the target is to reach sustainable development, defined by Rogall (2010) as an opportunity to reach sufficiently high economic, socio-cultural and ecological standards within the tolerances for nature. Besides direct waste management, waste sorting,

recycling and its processing, the waste management includes also the entire system of waste collection as well as waste sorting and processing.

Rapid increase in demand for consumer goods has been accompanied by increase in waste production. According to the sustainable development principle, the waste management policy should be focused on reducing the impact of generated waste on natural environment. Dobrzanski et.al indicates that the reduced impact of consumption on natural environment considering waste results from observing the 3R principle, which means avoiding waste creation (reduce), multiple use (reuse) and recovery of recyclable materials (recycle) (Dobrzanski G. et.al, 2012).

The main goal of the study is evaluation of changes as far as waste production and waste treatment in the EU countries is concerned. The following research tasks have been adopted:

- to present changes in waste management legal regulations;
- to indicate waste generation level in the EU countries;
- to analyse and evaluate changes in the field of waste recovery and recycling.

In this context there is an important question, how could we decrease production and consumption in order to generate lower quantity of waste or recycle them appropriately and use again.

Research results and discussion

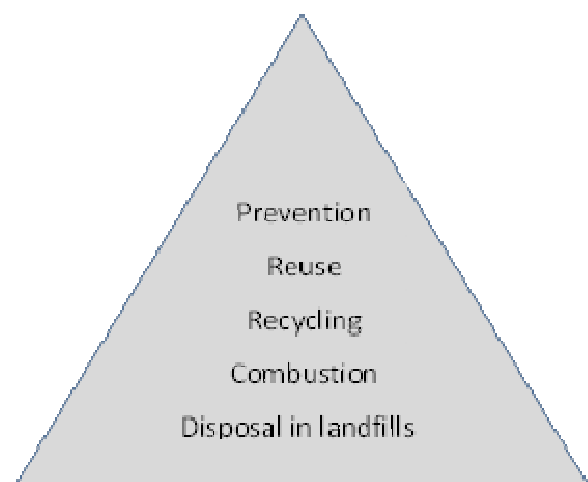
Waste management regulations

When preparing ex post analysis, it should be indicated, as Pichtel states, that first organized system of municipal waste collection has been created by Romans. In the ancient Rome household waste was thrown away on the streets, to rivers or holes in the ground on city outskirts. Employed workers were collecting waste from streets and transporting them out of city. At the same time waste storage in a close vicinity of the city was banned and it was

punishable (Pichtel J., 2005). The waste related problem has been noticed already in the ancient times but at that time it was not a threat to natural environment that was able to "absorb" negative consequences of human activity but only some unpleasant smells resulting from waste decomposition (it could have led to development of diseases creating a danger for human beings).

The first regulations regarding purity were established in Athens c.a. in the V century BC (Radziejewicz J., 2013). The first waste incineration plant in the world was opened in England in 1870. Modern waste management was started in Europe in the 1960s. In 1972 the first law on waste management was prepared in Germany. In Poland similar law was passed after transformation of the political system in 1998 only and after it was adapted to the EU principles. Waste management hierarchy was established then (Janka W., www) (Figure 1).

The appropriate waste management hierarchy is extremely important. Compliance with the law gives opportunity to reduce negative impact on the environment as well as optimum use of substances contained in waste (valuable resources can be saved).



Source: Janka W. *Historia gospodarki odpadami/ History of waste management*. Retrieved: http://www.zgkim.zgora.pl/cms/images/pdf_files. Access: 9.01.2017.

Fig. 1. European waste management hierarchy

As Barczak indicates, the personal scope of the hierarchy relates to natural persons, legal

persons as well as entities having no legal personality including in particular business entities (Barczak A., 2015). The current guidelines and regulations concerning waste management result from the EU policy on the sustainable waste management (Foltynowicz Z., Mancewicz M., 2012).

An important regulation in this respect is the European Union directive on waste (Directive..., 2008). It determines Union-wide performance targets in order to prevent, treat and dispose of waste until 2020. This Directive lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use. The Directive includes also some regulations concerning waste management hierarchy. When applying the waste hierarchy, Member States shall take measures to encourage the options that deliver the best overall environmental outcome. This may require specific waste streams departing from this order where this is justified by life-cycle thinking on the overall impacts of the generation and management of waste.

Member States shall ensure that the development of waste legislation and policy is a fully transparent process, observing existing national rules about the consultation and involvement of citizens and stakeholders. Following factors must be taken into account in the member states: general environmental protection principles of precaution and sustainability, technical feasibility and economic viability, protection of resources as well as the overall environmental, human health, economic and social impacts.

In accordance with the polluter-pays principle, the costs of waste management shall be borne by the original waste producer or by the current or previous waste holders (Sklarzewska M., 2016). Member States may decide that the costs of

waste management are to be borne partly or wholly by the manufacturer of the product from which the waste comes and that distributors of such product may partly share these costs (Directive ... 2008).

In Poland similar waste management hierarchy has been introduced by adopting The Waste Management Act of 14 December 2012:

- waste prevention;
- preparing for reuse;
- recycling;
- other recovery;
- waste disposal.

Prevention of waste includes some measures (concerning the product, material or substance before they become waste) reducing waste quantity, negative impact of waste produced on the environment and human health as well as the content of harmful substances in materials and products. Everyone who undertakes actions that cause or may cause creation of waste should plan and undertake them in a way that as the first priority waste should be prevented or its quantity reduced. As Radziewicz indicates, weight of waste reduction to the level that guarantees raw material, ecological and sanitary equilibrium is not possible without far-reaching synchronization of technology and way of living with ecological formation and functioning (Radziewicz J., 2011).

Preparation for reuse indicates necessity of using products or part of products that are not waste again for the same purpose as they were originally designed. Waste reuse or preparation for reuse criteria shall be also taken into account by public finance entities when granting public works contracts. Recycling is a type of recovery when waste is re-processed or re-used. It includes reprocessing of the organic material (organic recycling) but it does not include recovery of energy and re-processing it into materials. Some other recovery processes could also exist and due to those processes waste could serve a useful purpose being a substitute for other materials (e.g. recovery of energy). Waste

not prevented should be subject to recovery in the first place. If it is impossible to introduce waste recovery procedure, then the waste holder is obliged to dispose of and if it is impossible to dispose of some waste, only this kind of waste should be stored.

The EU policy in the field of waste management has been subject to significant changes. Some of them are focused on enhancement of waste treatment strategy adopted yet in initial documents (as it happens in case of waste management hierarchy). Much more important change refers to transformation of the initial perception of waste as something redundant into development of waste life cycle concept where attention is paid to potential benefits of waste (Kosieradzka-Federczyk A., 2013).

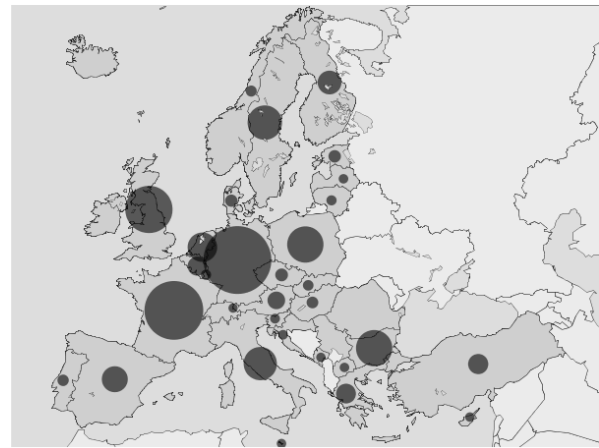
Impact of harmful factors on the environment is mostly associated with industrial activity but statistical data indicate that the biggest threat is created by use of product and associated post-consumed waste (Adamczyk W., 2004).

Hoornweg i Bhada-Tata indicate that it is one of the most important problems regarding the by-products (waste) life style and manufacturing, especially in cities, and its importance grows even faster than urbanisation rate (Hoornweg D., Bhada-Tata P., 2012).

Similarly in the context of post-consumed waste management, Nagyova, Kosciarova and Holiencinova indicate that they should be used in a way that is not dangerous for future generations (Nagyova L., Kosciarova I., Holiencinova M., 2016).

Waste generation in the EU countries

There are huge differences among countries as far as use of natural resources per capita and waste generation is concerned (Map 1).



Source: Eurostat (online data code: env_wasgen)
Retrieved:http://ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics. **Access: 5.01.2017.**

Map 1. Generation of waste by economic activity in the EU country in 2014

Change of consumption models results from changes in society and economy. Foodstuff, beverages, private transport and residential sector are those categories of consumption impacting the environment in the most significant way.

Results indicate that the highest level of waste generation was in Germany. France and Great Britain are also at the top of the list. Substantial amounts of waste have been also produced in Bulgaria and Italy (Table 1).

When analysing waste production based on selected types of business activity in the EU countries, it should be stated that mining, construction and demolition are dominating ones (Figure 2). Similarly in Poland the main source of waste is mining sector (52 % ca. of the total waste produced), then industrial processing (20 %), manufacturing and power supply (Environment, 2014). Slightly less significant is municipal waste but there is a big problem with its disposal and the easiest way is to transport it to landfills.

In 2007, the three types of business activity mentioned above plus household waste in total created 70–80 % of total impact on the environment (Zrownowazona ..., 2007).

Table 1

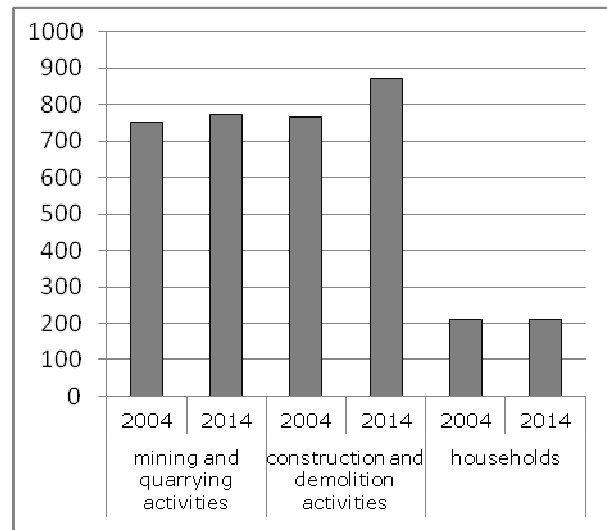
Waste produced in the EU countries in 2004, 2010, 2014

| Countries* | 2004 | 2010 | 2014 |
|----------------|---------|--------|--------|
| Austria | 53021 | 34883 | 55868 |
| Belgium | 52809 | 62537 | 65573 |
| Bulgaria | 201020 | 167203 | 179598 |
| Croatia | 7209 | 3158 | 3728 |
| Cyprus | 2242 | 2373 | 2051 |
| Czech Republic | 29276 | 23758 | 23395 |
| Denmark | 12589 | 20965 | 20081 |
| Estonia | 20861 | 19000 | 21804 |
| Finland | 69708 | 104337 | 95970 |
| France | 296581a | 355081 | 327997 |
| Greece | 33347 | 70433 | 69759 |
| Spain | 160668 | 137519 | 110952 |
| Netherlands | 92448 | 119255 | 134146 |
| Lithuania | 7010 | 5583 | 6200 |
| Luxembourg | 8316 | 10440 | 7073 |
| Latvia | 1257 | 1498 | 2621 |
| Malta | 3146a | 1288 | 1665 |
| Germany | 364022 | 363545 | 387504 |
| Poland | 137478 | 159458 | 179018 |
| Portugal | 29317a | 38347 | 14587 |
| Slovakia | 10668 | 9384 | 8901 |
| Slovenia | 5771 | 5159 | 4686 |
| Sweden | 91759 | 117645 | 167027 |
| Hungary | 24661a | 15735 | 16651 |
| United Kingdom | 298799 | 259068 | 251780 |
| Italy | 139806 | 158628 | 159107 |

*Ireland and Romania have not been included due to lack of data for the period presented

Source: Environment 2012 and 2014. Statistical Information and Elaborations. Central Statistical Office, Warsaw 2013 and 2015.

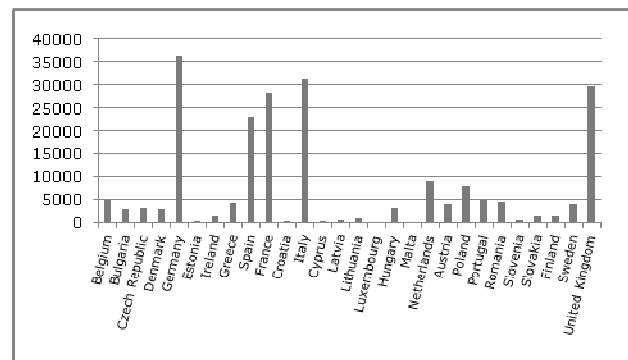
Municipal waste is defined as waste generated in households excluding end-of-life vehicles and also waste not containing hazardous waste (Rozanska B., Sobczyk M., 2010).



Source: Environment 2014. Statistical Information and Elaborations. Central Statistical Office, Warsaw 2015.

Fig. 2. Generation of waste by selected economic activities in 2004 and 2014

The highest quantity of municipal waste among the EU countries has been generated in Germany and Great Britain (Figure 3).

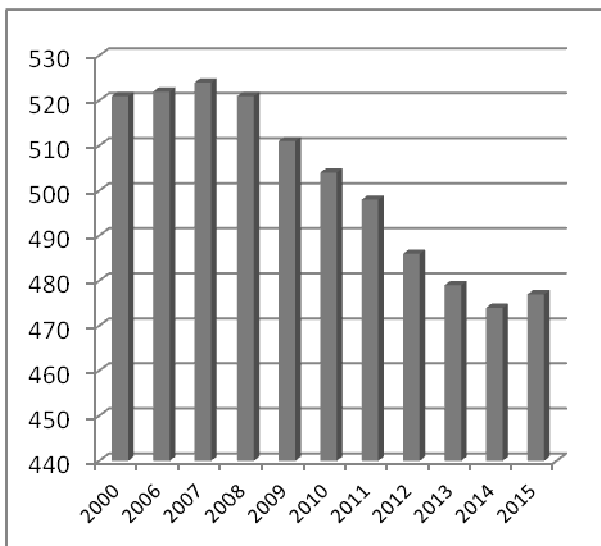


Source: Municipal waste generated by country. 2016, Retrieved: <http://ec.europa.eu/eurostat>. Access: 3.01.2017

Fig. 3. Municipal waste produced in the EU countries on average 2004-2014 (thousand of tonnes)

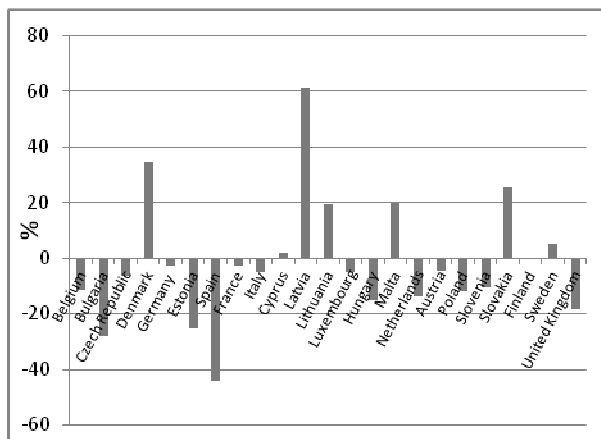
Since 2006, on average in 28 countries of the EU we can observe reduction of generated waste per capita (Figure 4). In 2015, there was a slight increase resulting from huge increase of waste production in Lithuania, Denmark and Slovenia (Figure 5).

involved in some attempts to recover and re-use waste.



Source: *Municipal waste generated by country, 2016*. Retrieved: <http://ec.europa.eu/eurostat>. Access: 3.01.2017

Fig. 4. **Municipal waste generated by country in 2000 and 2006-2015**

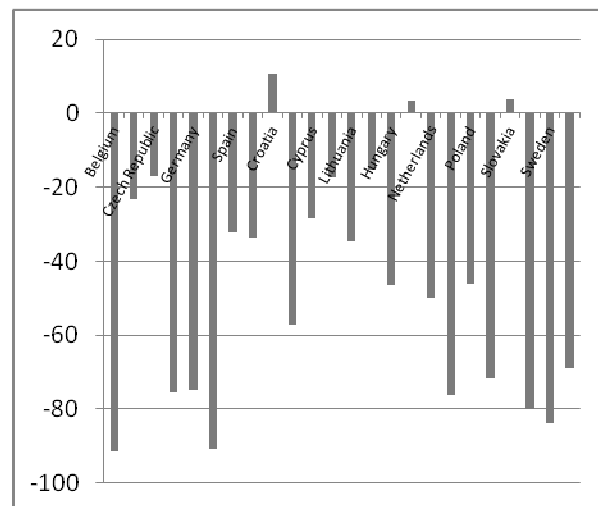


Source: *author's calculations based on: Municipal waste generated by country in selected years*. Retrieved: <http://ec.europa.eu/eurostat> Access: 9.01.2017

Fig. 5. **Changes in municipal waste production in the EU countries 2000-2015**

Waste recovery and recycling

Waste generation decrease is limited if we want to maintain consumption on a satisfactory level. It is important to pay attention to re-use and recycling. We can observe it presenting changes in waste storage on landfills. In the EU countries, in 2006-2015 the quantity of waste stored per capita significantly decreased (Figure 6). Only in Croatia, Slovakia and Malta the quantity of waste stored increased. In all the other countries, it decreased by more than 50 % on average. The most significant decrease was in Belgium and Estonia (more than 90 %) and in Sweden and Finland (more than 80 %). It shows that the EU countries are more and more



Source: *author's calculations based on: Municipal waste generated by country in selected years*. Retrieved: <http://ec.europa.eu/eurostat>. Access: 9.01.2017

Fig. 6. **Change in quantity per capita of waste for storage on landfills in the EU countries 2006-2015 (%)**

Changes in recycling rate in the EU countries have been presented in Table 2. The recycling rate is the tonnage recycled from municipal waste divided by the total municipal waste arising. Recycling includes material recycling, composting and anaerobic digestion. Municipal waste consists to a large extent of waste generated by households, but may also include similar wastes generated by small businesses and public institutions and collected by the municipality.

This latter part of municipal waste may vary from municipality to municipality and from country to country, depending on the local waste management system (Recycling..., 2016).

During a period of 14 years, the highest increase of waste recycling was observed in the Czech Republic and Hungary. Significant increase of the indicator was also observed in Poland and Estonia.

But these are countries that started from a very low level of recycling, few percent only or even below 1 % (the Czech Republic). Therefore it is necessary to prove that significant progress in the field of recycling has been observed in those countries.

Table 2

Municipal waste recycling indicator (the EU countries)*

| Country | Recycling rate (%) | | | |
|----------------|--------------------|------|------|------|
| | 2000 | 2005 | 2010 | 2014 |
| Belgium | 48.4 | 53.8 | 57.7 | 55.1 |
| Bulgaria | 15.5 | 18.3 | 24.5 | 23.1 |
| Czech Republic | 0.9 | 6.2 | 15.8 | 25.4 |
| Denmark | 31.5 | 34.4 | 42.3 | 44.3 |
| Germany | 52.5 | 60.9 | 62.5 | 63.8 |
| Estonia | 2.4 | 22.5 | 18.2 | 31.3 |
| Spain | 18.4 | 31.4 | 29.2 | 32.6 |
| France | 24.5 | 29.7 | 34.9 | 39.2 |
| Italy | 14.2 | 18.5 | 31.0 | 42.5 |
| Cyprus | 3.0 | 3.7 | 10.7 | 17.7 |
| Luxembourg | 36.1 | 43.5 | 46.5 | 46.6 |
| Hungary | 1.6 | 9.6 | 19.6 | 30.5 |
| Malta | 10.1 | 8.7 | 5.2 | 10.9 |
| Netherlands | 44.1 | 46.7 | 49.2 | 50.9 |
| Austria | 63.4 | 58.3 | 59.4 | 56.3 |
| Poland | 2.1 | 5.6 | 21.4 | 32.3 |
| Portugal | 10.5 | 15.2 | 18.7 | 30.4 |
| Slovenia | 6.0 | 18.6 | 22.4 | 36.0 |
| Slovakia | 5.1 | 2.0 | 9.1 | 10.3 |
| Finland | 33.6 | 33.6 | 32.8 | 32.5 |
| Sweden | 38.3 | 44.8 | 48.1 | 49.9 |
| United Kingdom | 11.1 | 26.7 | 40.2 | 43.7 |
| Average | 22.5 | 28.2 | 33.3 | 38.3 |

*The survey includes only those countries where data have been available

Source: author's calculations based on: *Recycling rate ...*, 2016. Retrieved: <http://ec.europa.eu/eurostat>. Access: 9.01.2017

Conclusion

Waste issue and its management were addressed even before the birth of Christ. In the past, this phenomenon was not a problem and it was not a threat to the environment and human beings. In the second half of the XX century, in Europe modern waste management was initiated and legal regulations introduced.

Bibliography

1. Adamczyk, W. (2004). *Ekologia wyrobów (Product Ecology)*. PWE, Warszawa. p. 244.
2. Barczak, A. (2015). Hierarchia sposobów postępowania z odpadami a akty prawa miejscowego (The hierarchy of waste management practices and acts of local law). *Zeszyty Naukowe Uniwersytetu Szczecińskiego, Acta Iuris Stetinensis* 11. No 870. pp.27-38.
3. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives/Dyrektywa 2008/98/EC Parlamentu Europejskiego i Rady z 19 listopada 2008 r. w sprawie odpadów oraz uchylająca niektóre dyrektywy, Dz. U. UE L 312 z 22.11.2008
4. Dobrzanski, G., Dobrzanska, B., Kielczewski, D. (2012). *Ochrona środowiska przyrodniczego (Protecting the natural environment)*. PWN, Warszawa, p. 459.
5. Environment. (2012). *Statistical Information and Elaborations*. Central Statistical Office, Warsaw 2013. p. 580.

Currently, in all the EU countries increasing needs for raw materials in consumption and production (among others in industry and construction, in food sector) cause the need to pay particular attention to use waste as secondary raw materials in the best possible way.

Significant progress has been achieved in the field of waste management in the EU. Since 2006, the quantity of waste produced per capita decreased by 8 % ca. The share of landfilled waste has also been significantly reduced. On average, in most EU countries it has decreased by more than 50 % and in Belgium and Estonia even more than 90 %. It is a positive phenomenon indicating activities leading to appropriate waste management.

Countries that joined the EU in the recent years have also made significant progress in the field of recycling. The waste recycling indicator value in the Czech Republic, Hungary, Poland and Estonia has increased even more than thirty times (e.g. the Czech Republic).

Introduction and implementation of appropriate waste management requires taking into account socio-psychological aspect as well as the role of different entities and social groups forming it as a part of relevant system. It was not a purpose of this study but it is so important issue that detailed research and analysis should be conducted in this field. It is also recommended to emphasize the awareness-raising as far as waste generation and separation is concerned. It is also necessary to remember that waste managed in the best way is the waste that has never been produced.

6. Environment. (2014). Statistical Information and Elaborations. Central Statistical Office, Warsaw 2015. p. 565.
7. Eurostat (online data code: env_wasgen). Retrieved: http://ec.europa.eu/eurostat/statistics-explained/index.php/Waste_statistics. Access: 5.01.2017.
8. Foltynowicz, Z., Mancewicz, M. (2012). Historia gospodarki odpadami (History of Waste Management). Cz. I, Recykling 9(141).
9. Golebiewska, B. (2015). Agricultural Activity and the Problem of Environmental Protection in Poland. Sucasni socialno-ekonomichni tendencii rozvitku APK Ukraini: kolektivna monografia. ed. Nesterchuk U. O. Uman: Vidavec Socinskii, Human, Ukraina. pp. 9-15.
10. Hoornweg, D., Bhada-Tata, Perinaz. (2012). What a Waste: A Global Review of Solid Waste Management. Urban development. series; knowledge papers no. 15. World Bank, Washington, DC. p. 116.
11. Janka, W. Historia gospodarki odpadami. (History of waste management). Retrieved: <http://www.zgkim.zgora.pl/cms/images/pdf>. Access: 9.01.2017.
12. Kociszewski, K. (2013). *Ekologizacja polskiego rolnictwa a jego zrownowazony rozwoj w warunkach czlonkostwa w Unii Europejskiej* (Polish Greening agriculture and its sustainable development in terms of membership in the European Union). Wyd. Uniw. Ekonomiczny, Wroclaw. p.402.
13. Kosieradzka-Federczyk, A. (2013). Priorytety Unii Europejskiej w gospodarowaniu odpadami (EU priorities in waste management). *Zeszyty Naukowe Wydzialu Informatycznych Technik Zarzadzania Wyzszej Szkoły Informatyki Stosowanej i Zarzadzania*. Wspolczesne Problemy Zarzadzania Nr 1. pp. 47-63.
14. *Municipal Waste Generated by Country in Selected Years*. Retrieved: <http://ec.europa.eu/eurostat>. Access: 9.01.2017.
15. Nagyova, L., Kosciarova, I, Holiencinova, M. (2016). Sustainable Consumption of Food: A Case Study of Slovak Consumers. *Economic Science for Rural Development*" No 43. pp. 167-174.
16. Pichtel, J., (2005). Waste Management Practices: Municipal, Hazardous, and Industrial, CRS Press, USA. p. 688.
17. Privitera, D. (2016). Describing the Collaborative Economy: Forms of Food Sharing Initiatives. *Economic Science for Rural Development*" No 43, Jelgava, LLU ESAF, pp. 92-98.
18. Radziejewicz, J. (2013). Smieci – powazny problem wspolczesnych metropolii. *Rolniczy Magazyn Elektroniczny* Nr 53. CBR, Retrieved: <http://rme.cbr.net.pl/index.php/archiwum-rme>. Access: 10.01.2017.
19. Radziejewicz, J., (2011). Problemy gospodarki odpadami w Polsce. *Rolniczy Magazyn Elektroniczny* nr 42, CBR. Retrieved: <http://rme.cbr.net.pl/index.php/archiwum-rme>. Access: 9.01.2017.
20. *Recycling Rate of Municipal Waste* (2016). Retrieved: <http://ec.europa.eu/eurostat>. Access: 9.01.2017.
21. Rogall, H. (2010). *Ekonomia zrownowazonego rozwoju. Teoria i praktyka* (Economics of sustainable development. Theory and practice). Wyd. Zysk i S-ka. p. 578.
22. Rozanska, B., Sobczyk, M. (2011). *Infrastruktura komunalna w 2010 r.* (Municipal infrastructure in 2010). Informacje i opracowania statystyczne. GUS Warszawa. p.25.
23. Sklarzewska, M. (2016). Ogolne zasady postepowania z odpadami. Retrieved: www.ekoportal.gov.pl. Access: 9.01.2017.
24. Ustawa o odpadach z 14 grudnia 2012 r. Dz.U. 2013 poz. 21. (Waste Management Act of 14 December 2012).
25. Waste and Material Resources. (2016). Retrieved: <http://www.eea.europa.eu/themes/waste>. Access: 9.01.2017.
26. Zrownowazona produkcja i konsumpcja (*Sustainable Production and Consumption*). (2007). Srodowisko Europy, Czarty Raport Oceny, European Environment Agency. Retrieved: www.eea.europa.eu/pl/publications/state_of_environment_report. Access: 30.12.2014.

ASSESSMENT OF THE INTENSITY AND ACTIVITY OF USE OF EU FUNDS IN ZEMGALE REGION

Ingrida Jakusonoka¹, Dr.oec., professor; Baiba Rivza², Dr.oec., professor

^{1,2} Latvia University of Agriculture, Latvia

Abstract. The research aim is to examine and assess the intensity and effectiveness of investment from the EU Structural Funds and the Cohesion Fund in Latvia as a whole as well as in Zemgale region municipalities.

The research compared and assessed the intensity of investment of EU funds per capita in Latvia and CEE countries in the period 2007-2016 and identified the effect on GDP growth. To assess the attraction of EU structural and cohesion funding in Latvia, the following specific research tasks were set: to summarise and systemise information on changes in the absorption of EU funding in Latvia, including that for the development of Zemgale region municipalities in the period 2007-2015, to analyse the amount and intensity of absorption of EU structural and cohesion funding; to perform a quantitative assessment of the effect of EU funding on the development of Zemgale region municipalities in the period 2007-2015; to analyse the results of EU co-funded projects implemented in Zemgale region and the intensity of absorption of EU funding by priority and by activity as well as if measured per capita.

Key words: EU funds, municipalities, CEE, Latvia, Zemgale region.

JEL code: O18, R11, R51

Introduction

The most important regional development problems that are typical of the whole territory of the country relate to socio-economic disparities across the regions, including an explicitly monocentric and capital city-oriented pattern of residence and economic activity and the insufficient competitiveness of Latvia's regions and development centres (Regionalas politikas ..., 2013).

According to the 2016 Report on the Implementation and Achievement of the Horizontal Priority "Macroeconomic Stability" in 2015 by the Ministry of Finance of the Republic of Latvia, in recent years Riga as the capital city attracted the greatest amount of funding from the EU Funds – in 2015, the proportion of EU funding disbursed in Riga statistical region was approximately 32 % of the total, while the disparities between Riga and the other regions continued increasing in 2015 (Zinojums par horizontalas... , 2016, p.14). This situation prompted the authors to do an in-depth research study within Zemgale region.

The research **aim** is to examine and assess the intensity and effectiveness of investment from the EU Structural Funds and Cohesion Fund in Latvia as a whole as well as in Zemgale region municipalities.

To assess the attraction of EU structural and cohesion funding in Latvia, the following specific research **tasks** were set:

- to compare the intensity of attraction of EU funding in Latvia and CEE countries in the period 2007-2016 and to identify the effect on GDP growth;
- to summarise and systemise information on the amount and intensity of absorption of EU structural and cohesion funding for the development of Zemgale region municipalities in the period 2007-2015 and to describe the enhancement aspects of attraction of EU funding.

Research methods: document and project analysis, comparative analysis, statistical analysis and grouping. Municipalities were grouped according to a classification of municipalities developed by the Ministry of Environmental Protection and Regional Development (MoEPRD).

Data on 22 municipalities and two cities of Zemgale region were summarised, grouped and assessed to perform a quantitative analysis. The municipalities were divided into seven groups (Table 1). The calculations did not take into account the projects that were implemented in cooperation with Vidzeme or Kurzeme municipalities as well as the capital city of Riga:

¹ Corresponding author. Ingrida Jakusonoka Tel.: +371 63024214. E-mail address: Ingrida.Jakusonoka@llu.lv.

four ERDF projects, eight ESF projects and four CF projects.

The research used the following information sources: data of the management information system (MIS) for EU funds, data provided by the Ministry of Finance and the Ministry of Environmental Protection and Regional Development of the Republic of Latvia, data on control of EU funding use that are summarised and structured in databases available on websites, data provided by the Central Statistical Bureau of Latvia, research findings and papers by national scientists, research papers by

researchers from the EU Member States, Eurostat data etc.

The management information system for EU funds collects information on the amounts of funding received from the EU Funds (the European Social Fund (ESF), the European Regional Development Fund (ERDF) and the Cohesion Fund (CF)), thereby providing a unified data source that records and controls EU co-funded projects and allows analysing their effects on regional development broken down by municipality and by region.

Table 1

Zemgale region municipalities grouped for an analysis of the use of EU funds

| Group of municipalities | Zemgale region cities and municipalities | Group No. |
|---|--|------------------|
| Regional level | Zemgale | 1 |
| Development centres of national significance | Jelgava, Jekabpils | 2 |
| Municipalities (with a development centre of regional significance) with a population of more than 10000 | Dobele municipality | 3 |
| Municipalities (with a development centre of national significance) with a population of more than 5000 | Aizkraukle municipality, Bauska municipality | 4 |
| Municipalities (without a development centre of regional significance) with a population of more than 10000 | Jelgava municipality | 5 |
| Municipalities (without a development centre of regional significance) with a population of more than 5000 | Municipalities of Auce, Iecava, Jaunjelgava, Jekabpils, Koknese, Krustpils, Ozolnieki, Plavinas and Vecumnieki | 6 |
| Municipalities (without a development centre of regional significance) with a population of less than 5000 | Municipalities of Akniste, Nereta, Rundale, Sala, Skriveri, Tervete and Viesite | 7 |

Source: authors' construction based on the classification of the MoEPRD

The assessment was performed both in absolute numbers (the total amount of support disbursed in a territory) and in relative numbers (per capita for a particular territory) for the period 2007-2015, as well as the distribution of EU funding was analysed by group of municipalities.

**Research results and discussion
Assessment of the results of implementation of EU co-funded projects**

The effective use of EU funding is impossible without performing regular assessments of the absorption of the funding in terms of quality and of the effects on the national economy and

regional development. A number of leading researchers of the EU Member States pointed to opportunities to actively stimulate entrepreneurship in regions, shape an innovative environment, reduce regional disparities and use the EU Funds as instruments to achieve the mentioned objectives (Grinevica L., Rivza B., Rivza P., 2016; Jankova L., 2013; Bulderberga Z., 2014; Jakusonoka I., 2007; Rivza B., Kruzmetra M., Zaluksne V. (2016) et al.). Higher effectiveness of Cohesion Policy investment is possible in the Member States that are implementing financial discipline, which allows concentrating Cohesion Policy instruments on

eliminating the disparities in development (Jankava L., Jurgelane I., Auzina A., 2016).

The aims of preparing and implementing public projects are the achievement of sustainable development, rural or regional development, reducing poverty, ensuring equal opportunities, and other strategies and goals of countries (V.Alekneviene, J.Baranauskiene, 2014).

Research studies on the effective use of EU funds conducted in various EU Member States have yielded diverse results, which were influenced by a number of aspects. A research investigation done by Lithuanian scientists allowed concluding that "whereas from the point of permanent job cost, the most inefficient investment was made into the development of the production sector. In the short-term, (all jobs) investments made in Lithuania into human capital and the development of physical infrastructure turned out to be the most efficient" (A.Aleksandravicius, A.Raupeliene, 2014).

Table 2

EU funds attracted by the CEE countries in the period 2007-2016

| CEE countries | EU funds per capita (EUR) | EU funds as a % of GDP |
|------------------------------------|---------------------------|------------------------|
| Bulgaria | 927 | 15.1 |
| Croatia | 305 | 3.0 |
| Czech Republic | 2496 | 15.9 |
| Estonia | 2592 | 16.6 |
| Hungary | 2529 | 22.9 |
| Latvia | 2298 | 18.6 |
| Lithuania | 2320 | 18.2 |
| Poland | 1768 | 15.7 |
| Romania | 960 | 10.8 |
| Slovakia | 2144 | 14.9 |
| Slovenia | 1988 | 10.6 |
| CEE average | 1848 | 14.8 |
| Latvia +/- against the CEE average | + 450 | + 3.8 |

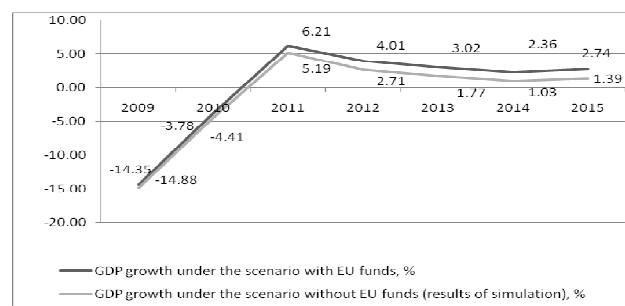
Source: authors' construction based on Zinojums par horizontalas..., 2016

The amount of funding from the European Social Fund, the European Regional Development Fund and the Cohesion Fund reached EUR 4.5

billion in Latvia in the period 2007-2013, while in the programming period 2014-2020 it could reach EUR 4.418 billion.

In terms of attraction of EU funding in the period 2007-2016, Latvia ranked second behind Hungary among the Central and East European countries; if measured as a % of GDP, the amount of EU funds comprised 18.6 %, which was 3.8 % more than the average in the CEE countries (Table 2). The attraction of EU structural funding (from the ERDF and the ESF) and EU cohesion funding in the CEE countries if measured per capita totalled EUR 1848; in Latvia this figure was higher by EUR 450 and reached EUR 2298 per capita.

The effects of EU funds were widely analysed in conjunction with entrepreneurial activity assessments at national level and GDP growth broken down by region. After assessing the effect of EU structural and cohesion funds on economic growth in Latvia, the Ministry of Finance of the Republic of Latvia concluded that in general in the period 2011-2015, the contribution of the EU funds to GDP growth was, on average, 1.3 percentage points (Zinojums par horizontalas..., 2016).



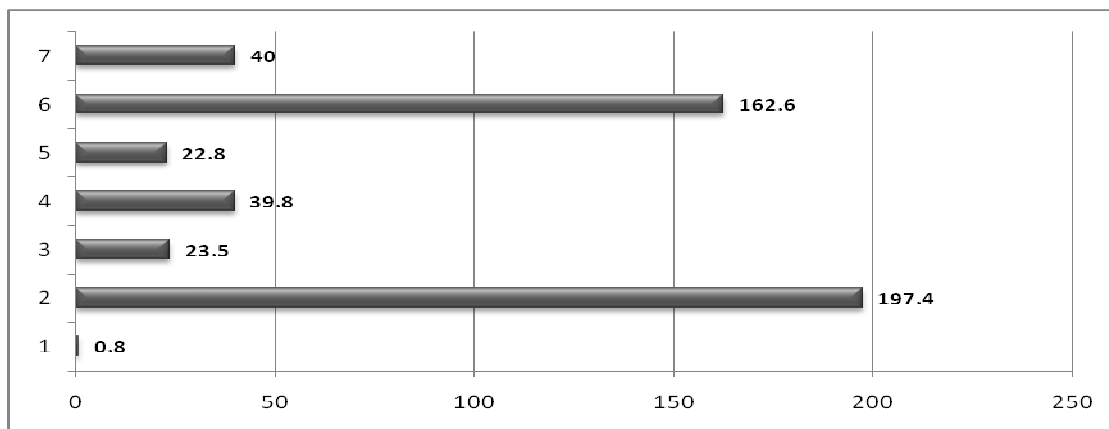
Source: authors' construction based on Zinojums par horizontalas..., 2016

Fig. 1. Effects of EU structural and cohesion funds on GDP growth in Latvia in the period 2009-2015

The total budget of 855 projects, examined in the research, that were implemented in Zemgale region municipalities was equal to EUR 815.3 million; the EU co-funding rate was, on average, 60 % of the total project budget and the EU co-funding per capita reached EUR 1693. However, the amounts of attracted EU funding considerably varied across various groups of municipalities.

Two development centres of national significance (Jelgava and Jekabpils – the second group of municipalities) accumulated EUR 197.4 million (Figure 2) or 40.5 % of the total EU co-funding in

the region, while the remaining 20 municipalities (3rd-7th groups) attracted EUR 289.6 million or 59.5 %.



- 1 Regional level
- 2 Development centres of national significance
- 3 Municipalities (with a development centre of regional significance) with a population of more than 10000
- 4 Municipalities (with a development centre of national significance) with a population of more than 5000
- 5 Municipalities (without a development centre of regional significance) with a population of more than 10000
- 6 Municipalities (without a development centre of regional significance) with a population of more than 5000
- 7 Municipalities (without a development centre of regional significance) with a population of less than 5000

Source: authors' calculations based on EU funds..., 2015, esfinanses.lv.

Fig. 2. EU co-funding disbursed in the groups of municipalities in Zemgale region in the period 2007-015, mln. EUR

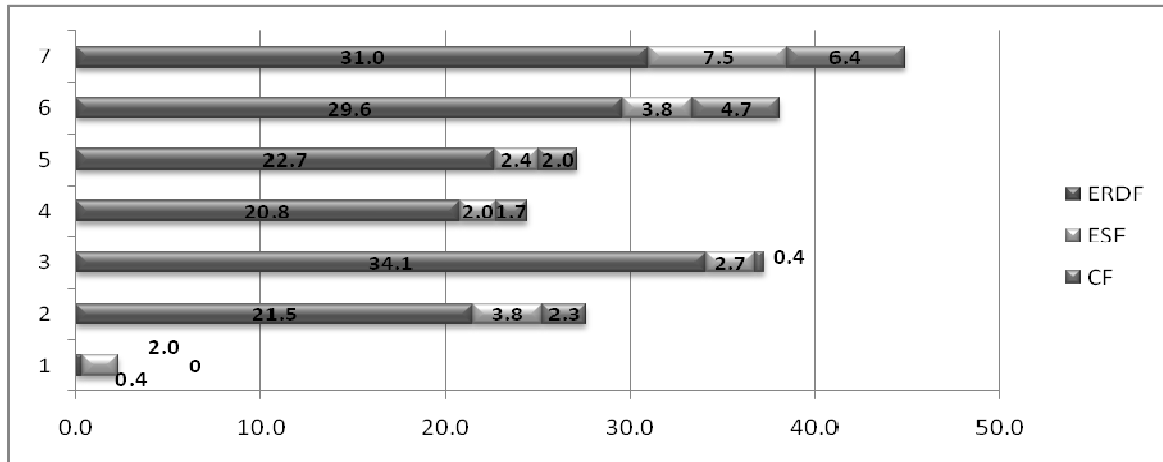
A report by the MoEPRD "Assessment of the Effect of EU Funds on the Development of Territories of Latvia in the Period 2007-2013" has noted that the recipients of EU co-funding pointed to various activities that are necessary in order to effectively attract various investors. These activities have to contribute to the following fields (ordered by relevance): repairs and construction of motor roads; construction of engineering networks, structures and communications; construction of buildings; establishment of business incubators, technological parks and industrial parks; construction and repairs of internal roads within facilities and around the facilities; and enhancement of building infrastructure (ES fondu..., 2016).

The number of accepted projects per 10000 capita was calculated to identify the activity of

attraction of EU co-funding (Figure 3). The group of municipalities that had a development centre of regional significance and a population of more than 10000 prevailed in submitting quality and acceptable projects (35.9 projects), which was followed by the group of municipalities that had no development centre of regional significance and had a population of less than 5000 (31 projects) and the group of municipalities that had no development centre of regional significance and had a population of more than 5000 (29.6 projects). However, the projects co-funded by the ESF and the CF were most actively implemented by the 7th group of municipalities that had no development centre of regional significance and had a population of less than 5000 (Figure 3). The intensity of attraction of EU co-funding is best characterised by investment per capita and the total budget of implemented

projects, including the amount of funding from the EU Funds (the ERDF, the ESF and the CF)

invested in achieving various socio-economic performance indicators.



- 1 Regional level
- 2 Development centres of national significance
- 3 Municipalities (with a development centre of regional significance) with a population of more than 10000
- 4 Municipalities (with a development centre of national significance) with a population of more than 5000
- 5 Municipalities (without a development centre of regional significance) with a population of more than 10000
- 6 Municipalities (without a development centre of regional significance) with a population of more than 5000
- 7 Municipalities (without a development centre of regional significance) with a population of less than 5000

Source: authors' calculations based on EU funds..., 2015, esfinanses.lv.

Fig. 3. Number of EU co-funded projects per 10000 capita in Zemgale region municipalities in the period 2007-2015

The authors' research allowed finding that 258 or 30 % of the 855 projects implemented in Zemgale region were implemented under the programme "Entrepreneurship and Innovation", 110 – under the programme "Human Resources

and Employment", while 487 – under the programme "Infrastructure and Services".

The intensity of attraction of EU co-funding per capita for the groups of municipalities is presented in Table 3.

Table 3

Intensity of implementation of EU co-funded projects per capita in the groups of municipalities of Zemgale region, EUR

| Groups of municipalities | ERDF co-funded projects | | ESF co-funded projects | | CF co-funded projects | |
|--------------------------|---------------------------------|----------------|---------------------------------|---------------|---------------------------------|--------------|
| | total project budget per capita | incl. the ERDF | total project budget per capita | incl. the ESF | total project budget per capita | incl. the CF |
| 1 | 25.76 | 21.85 | 10.99 | 9.36 | 0 | 0 |
| 2 | 2411.40 | 1681.29 | 106.49 | 52.47 | 1345.0 | 548.03 |
| 3 | 1706.45 | 821.41 | 14.29 | 12.68 | 309.0 | 209.86 |
| 4 | 1163.99 | 769.98 | 21.61 | 19.75 | 594.0 | 343.69 |
| 5 | 436.13 | 269.26 | 17.27 | 16.06 | 836.0 | 623.86 |
| 6 | 1198.93 | 782.28 | 19.15 | 16.45 | 3012.0 | 1660.30 |
| 7 | 1737.77 | 1179.76 | 45.08 | 42.88 | 454.0 | 273.15 |

Source: authors' calculations based on EU funds..., 2015, esfinanses.lv.

A comparison of the per-capita amounts of funding from the EU Funds (the ERDF, the ESF

and the CF) invested in projects in Zemgale region municipalities with the CEE average, which

was EUR 1848 per capita in the period 2007-2015, shows that this indicator was 23 % higher in the development centres of national significance (Jelgava and Jekabpils), while in the group of municipalities that had no development centre of regional significance and had a population of more than 5000 it was 33 % higher; the other groups of municipalities considerably lagged behind (Table 4).

The targets of the horizontal priority "Balanced Territorial Development" co-funded by the EU Funds can be achieved by taking into account the potential and ability of municipalities to create a higher value-added and a positive effect in the future. To promote the contribution of the EU Funds to exports in the programming period 2014-2020, the operational programme "Entrepreneurship and Innovation" was supplemented with two sub-activities (sub-activity 2.3.1.1.1 "Access to International Trade Markets – External Marketing" and sub-activity 2.3.1.1.2 "Access to International Trade Markets – Strengthening the International Competitiveness of Industries") as well as activity 2.3.2.3 "Cluster Programme" whose purpose is to facilitate access to international markets and promote cooperation among earlier unrelated businessmen and research, educational and other institutions, thereby contributing to the competitiveness of industries and businessmen as well as exports (Zinojums par horizontālas..., 2016).

Recipients of EU co-funding submit reports in accordance with Cabinet regulation No. 1 238 "Procedures for the Control and Assessment of Introduction of the European Union Funds"; the timely summarisation and examination of the reports allows analysing the results achieved for the entire current programming period and implementing the principles of distribution of funding, which directly contribute to achieving the targets set by the horizontal priorities and allow measuring returns on investment and,

subsequently, direct the investments to projects with higher returns.

Table 4

Intensity of attraction of EU funds (per capita) in Zemgale region in the period 2007-2015 compared with the CEE average

| Groups of municipalities | total EU co-funding, mln. EUR | per capita, EUR | as a % of the CEE average |
|--------------------------|-------------------------------|-----------------|---------------------------|
| 1 | 0.8 | 31 | 1.7 |
| 2 | 197.4 | 2282 | 123.5 |
| 3 | 23.5 | 1044 | 56.5 |
| 4 | 39.8 | 1133 | 61.3 |
| 5 | 22.8 | 909 | 49.2 |
| 6 | 162.6 | 2459 | 133.1 |
| 7 | 40 | 1496 | 81.0 |

Source: authors' calculations based on esfinanses.lv.

Conclusions

- 1) In terms of attraction of EU funding in the period 2007-2016, Latvia ranked second behind Hungary among the Central and East European countries; if measured as a % of GDP, the amount of EU funds comprised 18.6 %, which was 3.8 % more than the average in the CEE countries. The attraction of EU structural funding (from the ERDF and the ESF) and EU cohesion funding in the CEE countries if measured per capita totalled EUR 1848; in Latvia this figure was higher by EUR 450 and reached EUR 2298 per capita.
- 2) A comparison of the per-capita amounts of funding from the EU Funds (the ERDF, the ESF and the CF) invested in projects in Zemgale region municipalities in the period 2007-2015 with the CEE average shows that this indicator was 23 % higher in the development centres of national significance (Jelgava and Jekabpils), while in the group of municipalities that had no development centre of regional significance and had a population of more than 5000 it was 33 % higher; the other groups of municipalities considerably lagged behind.
- 3) The timely summarisation and examination of the reports allows analysing the results

achieved for the entire current programming period and implementing the principles of distribution of funding, which directly contribute to achieving the targets set by the horizontal priorities and allow measuring returns on investment and, subsequently, direct the investments to projects with higher returns.

Transformation, Smart Growth, Governance and Legal Framework for the State and Society for Sustainable Development - a New Approach to the Creation of a Sustainable Learning Community (EKOSOC-LV)" – sub-project 5.2.3 "Rural and Regional Development Processes and Opportunities in Latvia in the Context of Knowledge Economy".

Acknowledgements

The paper was supported by National Research Programme 5.2 "Economic

Bibliography

1. Aleknevičiene, V., Baranauskienė, J. (2014). Valuation of Public Projects by the Method of Cost-Effectiveness Analysis, No. 36, "Economic Science for Rural Development": Integrated and Sustainable Regional Development, Jelgava, LLU ESAF, pp. 118-128.
2. Aleksandravičius, A., Raupeliene, A. (2014) Assessment of Lithuanian Strategic Planning Documents on Infrastructure Development for New Jobs Creation in the Rural Areas , No. 36, "Economic Science For Rural Development": Integrated and Sustainable Regional Development, Jelgava, LLU ESAF , pp. 155-164.
3. Bulderberga, Z. (2015) Rural and Urban Municipalities in the Regions of Latvia – Development Tendencies and Challenges, No.38, "Economic Science for Rural Development": Integrated and Sustainable Regional Development, Jelgava, LLU ESAF, pp. 154-164.
4. ES fondu projekti, 2007-2015 (2015) (EU Funds Projects)Retrieved: <http://www.esfinanses.lv/lv/a/lapa/es-fondu-projekti>, Access: 25.11.2016
5. EU Funds in Central and Eastern Europe, 2016 / KPMG, p.10. Retrieved: <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/EU-Funds-in-Central-and-Eastern-Europe.pdf> Access: 25.02.2017.
6. ES fondu 2007.-2013.gadam ietekmes uz Latvijas teritoriju attīstību izvērtējums/ Nosleguma ziņojums. VARAM (Assessment of the Effect of EU Funds on the Development of Territories of Latvia in the Period 2007-2013/Final report. Ministry of Environmental Protection and Regional Development). Retrieved: http://www.varam.gov.lv/lat/publ/publikacijas/reg_att/?doc=13889. Access: 25.02.2017.
7. Grīneviča, L., Rīva, B., Rīva, P. (2016) Scenarios for Reducing Youth Unemployment and Promoting Sustainability in the Regions of Latvia. In: Journal of Security and Sustainability Issues, Volume 5, Number 3, pp. 437-449.
8. Jakusonoka, I. (2007) Strategy, Financing and Control of Rural Development Projects / Economics and Rural Development: Research papers Vol. 3. No. 1, Akadēmija, 2007.- pp. 17-24. ISSN 1822-3346
9. Jankova, L. (2013) EU Funds Financing for Member States, No. 31, "Economic Science For Rural Development": Integrated and Sustainable Regional Development, Jelgava, pp. 85-91.
10. Jankova, L., Jurgelane, I., Auzina, A. European Union Cohesion Policy / Proceedings of the International Conference "Economic Science for Rural Development" No. 42 Jelgava, LLU ESAF, 21-22 April 2016, pp. 79-85.
11. Reģionālās politikas pamatnostādņu 2013.–2019.gadam kopsavilkums (Summary of the Regional Policy Guidelines for 2013-2019). Retrieved: <http://www.varam.gov.lv/lat/pol/ppd/?doc=20773> Access: 25.02.2017.
12. Rīva, B., Kruzmetra, M., Zaluksne, V. (2016) Performance Trends for Smart Growth in the Rural Territories of Latvia. In: Agronomy Research. Vol. 14(5), pp. 1684-1693.
13. Ziņojums par horizontālās prioritātes „Makroekonomiska stabilitāte” īstenošanu un sasniegto 2015.gada (Report on the Implementation and Achievement of the Horizontal Priority "Macroeconomic Stability" in 2015). Rīga, 2016. p.6. Retrieved: http://www.esfondi.lv/upload/fm_hp_ms_zinojums_2015_precizets.pdf Access: 21.02.2017.

DEVELOPMENT OF THE MANAGEMENT RECOMMENDATIONS FOR THE ACCOMPANYING ADMINISTRATIVE TERRITORIES: CASE OF RIGA

Inga Jekabsons¹, Dr.admin.cand.; **Biruta Sloka**², Dr.oec., professor; **Ansis Grantins**³, PhD student

Abstract. An accompanying administrative territory or satellite town is a concept in urban planning that refers essentially to smaller metropolitan areas that are located somewhat near to but are mostly independent of larger metropolitan areas. Taking into account the rapid social economic development of satellite towns, which leads to the population growth in these municipalities, it is important to ensure the well-being for their citizens. The studies have proved that society well-being is directly related to the involvement of citizens in decision-making processes. In this context, it is important to ensure the management of the municipality where citizens are playing important role. Especially, it is important in satellite towns where society participation level and local patriotism is relatively low. However, the theoretical management issues of satellite towns are not analysed properly in scientific literature. Mostly researchers focus on spatial planning of these territories.

The aim of the paper is to propose possible management guidance for accompanying administrative territories of Riga based on case study approach.

Within this research, the analysis of scientific publications and scientific research are carried out; qualitative and quantitative research methods, including grouping, graphic analysis, expert survey, semi-structured interviews, focus group method, and case study are applied.

The main results and conclusions of the paper: based on the designed methodology on identification of accompanying administrative territories, 25 accompanying administrative territories around Riga were determined. One of the accompanying administrative territories – Salaspils municipality – was analysed from different perspectives (well-being indicators, public services, citizens' engagement etc.). The authors have provided management guidance for accompanying administrative territories on citizens' engagement, public service provision, and budgeting process.

Key words: municipalities, accompanying administrative territories, management, recommendations.

JEL code: I31, I38, H75, H83

Introduction

During the last decades, importance of local governance in promotion of citizen well-being has been stressed, because particularly the local governance has direct links with citizens – both informative and financial. In addition, nowadays the governance of i.e. metropolitan suburban areas or accompanying administrative territories is very outstanding, considering the rapid changes in socio-economic development of these territories, growth of population in these territories and other factors. In contrast to others, accompanying administrative territories have strong linkage to metropolis – large part of citizens of accompanying administrative territories work, study or have leisure activities in metropolis, whereas in their hometown they receive only certain services and have weak engagement in decision-making in municipality. This kind of situation has also developed in Riga

accompanying territories - it is a huge challenge for these municipalities to build such a management that would promote citizen well-being, engage citizens in decision-making and foster local patriotism.

The history of accompanying administrative territories has been extensively studied (Thomas, 1997; Merlin, 1980; Zyari, 2006; Zamani & Arefi, 2013); however, the experiences of accompanying administrative territories in Central and Eastern Europe have only recently been brought into focus (Prasca & Olau, 2013; Young & Kaczmarek, 2008; Kissfazenas, 2015).

Nevertheless, in scientific literature by now there is not much attention paid to challenges of suburban management. More emphasis is placed particularly on issues of environment, spatial planning and provision of infrastructure in these territories that are related to metropolis (e.g. Rumbakaite, 2012; Rumbach, 2014; Liqueun &

¹ Corresponding author. Tel.: + 371 271116147. E-mail address: inga.jekabsons@lu.lv

Junqing, 2016). Taking into consideration that almost 400 thousand inhabitants of Latvia¹ live in accompanying administrative territories of Riga and this number is continuously growing, it is crucial to ensure effective exchange of information upon localities in municipality, needs-oriented public services, including municipal events, as well as decision-making process in municipality, which is transparent for everybody.

The aim of the paper is to propose possible management guidance for accompanying administrative territories of Riga based on the case study approach.

In order to achieve the aim, the following tasks are formulated:

- 1) to present the possible methodology on determination of the accompanying administrative territories;
- 2) to analyse the management issues of typical accompanying administrative territory (case study of Salaspils municipality);
- 3) to provide the management guidance for the accompanying administrative territories based on the results of the case study.

The research object are accompanying administrative territories.

Within this research, the analysis of scientific publications and scientific research are carried out, qualitative and quantitative research methods, including grouping, graphic analysis, expert survey, semi-structured interviews, focus group method, case study are applied.

During the research, the answers to following questions would be found.

- Does public involvement in decision-making influences the level of citizen well-being?
- Which well-being aspects should municipality affect in promotion of higher level of well-being?

The theses to be defended as results of the research outcomes:

¹ According to the data of the Office of Citizenship and Migration Affairs, 397 323 inhabitants live in Riga's accompanying administrative territories as of 01.01.2016.

- 1) Public well-being is affected by relationships with municipality. Therefore, the promotion of citizen well-being management of Riga accompanying administrative territories should be based on public involvement, co-responsibility and reflective communication principles.
- 2) By performing its functions, the municipality should pay particular attention to such subjective well-being forming areas like education and development, health, infrastructure, culture and sports, private activities and initiatives.

Research results and discussion

1. Determination of the accompanying administrative territories of Riga

Most often accompanying administrative territories are referred to as satellite towns, populated places belonging to metropolitan agglomeration that are connected to metropolis in terms of transport, economy, commuting etc. links (State Regional Development Agency, 2009). The main characteristic of such towns is strong linkage to metropolis, around which these administrative territories have been established. Between satellite towns and centre of agglomeration there exists substantial commuting – a big share of inhabitants living in satellite towns work, study and spend their leisure time in metropolis (Golany, 1976; Mengyi, 2011).

The above mentioned characteristics of satellite towns in case of Latvia most prominently can be observed in Riga agglomeration. By analysing Riga agglomeration territory, one can conclude that in daily commuting realm of Riga is included territory, which encloses almost whole former Riga district, Jurmala and Jelgava cities, the biggest part of Ogre district and separate rural parts of Limbazi, Bauska, Jelgava and Tukums districts. Riga city's range of impact does not include whole Riga Planning Region – remote parts of former Limbazi and Tukums districts are not included. Riga city's range of impact includes

not only local rural municipalities, but also other bigger cities – republican level cities like Jurmala and Jelgava, former district centre Ogre and several smaller satellite towns. Jelgava city has two-fold situation –as the centre of Zemgale region it has to recon with the fact that big share of its inhabitants and enterprises have daily links with Riga (State Regional Development Agency, 2009).

Taking into consideration that there are many definitions of accompanying administrative territories, in case of Latvia these are defined as *districts and republican cities, which are situated within a reachable distance from metropolis Riga, which they have close economic and social links with. These administrative territories have bigger challenges in contrast to other administrative territories in promoting citizen well-being, taking into consideration rapid socio-economic development, relatively weak municipality links with public as well as low level of local patriotism.*

In order to determine Riga accompanying administrative territories, it is considered that those are administrative territories included in agglomeration of Riga, which have a pronounced characteristic of orientation towards the centre of agglomeration (Riga), considering different indicators:

- 1) amount of inhabitants and intensity of commuting to Riga in 2014 from administrative territories, based on personal income tax;
- 2) reachability of territories from Riga.

Territories calculated to be accompanying administrative territories of Riga and territories which are included in the zone of influence of Riga, but are not its accompanying administrative territories are displayed in Figure 1.

In accordance with the methodology developed (Jekabsone et.al., 2016), 25 accompanying administrative territories of Riga have been identified: Babite district, Marupe district, Kekava district, Stopini district, Salaspils district, Carnikava district, Olaine district,

Garkalne district, Ikskile district, Jurmala, Baldone district, Adazi district, Ropazi district, Saulkrasti district, Seja district, Incukalna district, Ogre district, Iecava district, Jelgava, Kegums district, Vecumnieki district, Ozolnieki district, Sigulda district, Krimulda district, Lielvarde district.



Source: author's calculations based on the State Revenue Service and public transport data (as of 01.10.2015)

Fig. 1. Riga accompanying administrative territories: results of calculation

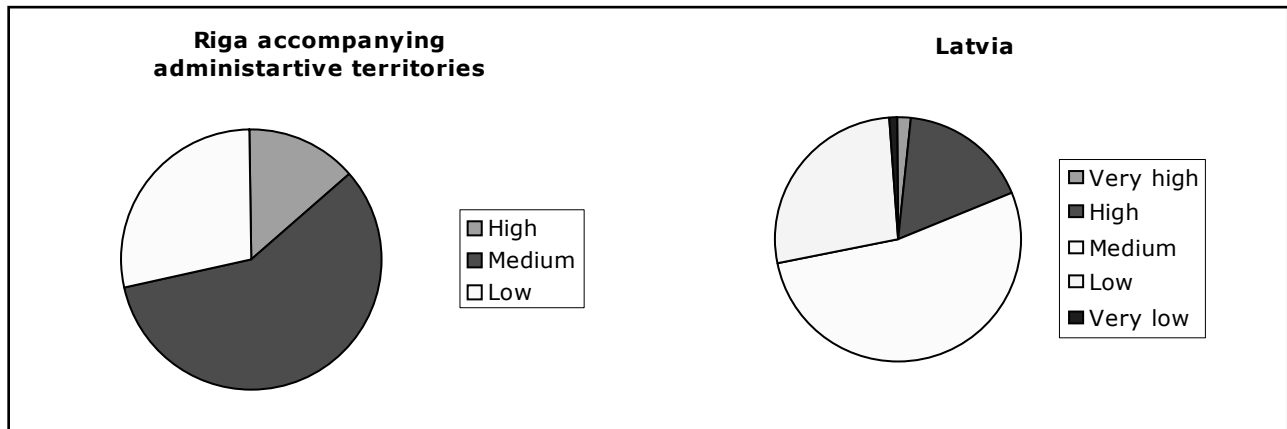
2. Analysis of the management issues of accompanying administrative territories

In order to highlight the possible management issues of accompanying administrative territories, the self-assessment of the mayors of Riga accompanying administrative territories on management of municipality (Central Statistical Bureau, 2013) was analysed. It can be concluded that compared with the average situation in Latvia, the mayors of Riga accompanying administrative territories are in stronger positions in the following issues: the chairmen of local governments should be directly elected, the number of members of the local government is too big. The leaders of Riga accompanying administrative territories on average evaluated higher the performance of health care institutions as well as sports institutions and public policy institutions. In turn, schools and pre-school educational

institutions were assessed by them lower than on average in Latvia. In case of assessment of the overall functioning of the municipal administration, the leaders of accompanying administrative territories of Riga assessed it slightly higher than the average in Latvia.

In addition, if the situation of citizens' engagement in the overall Latvia was compared

with Riga accompanying administrative territories, it could be concluded that in Riga accompanying administrative territories the involvement of society in decision-making processes is lower. Trend indicators show that the involvement in decision-making processes has increased during the last years, however it is still insufficient and should be improved (Fig. 2).



Source: Central Statistical Bureau, 2013

Fig. 2. The assessment of mayors of municipalities of participation of society in decision-making processes(% of the number of municipalities)

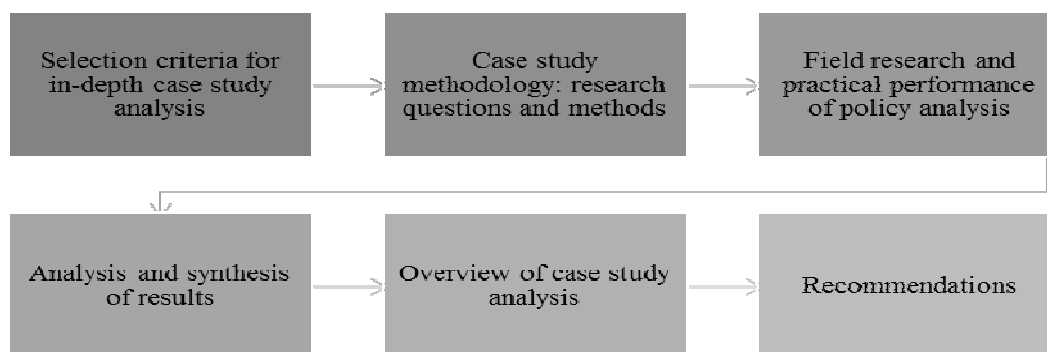
In order to analyse in depth the management issues of the accompanying administrative territories the case study approach was used.

During the last decades scientists employ case study analysis in order to create theoretical concepts upon various processes (Edmonson et al., 2001) and internal organisation (Galunic & Eisenhardt, 2001; Gilbert, 2005). Main reason of popularity of this approach is that this is one of the best (if not the best) method, which ensures link between absolute qualitative proof and main deductive studies (Eisenhardt & Graebner, 2007).

In order to carry out the case study analysis, a set of sequential steps is applied, according to which case study analysis is performed (Figure 3).

In order to choose the appropriate case study, which could serve as a basis for development of guidelines for management of Riga accompanying administrative territories, the following criteria were put forward:

- 1) it is one of the 25 identified accompanying administrative territories of Riga, according to the developed methodology;
- 2) according to calculated Well-being index (Jekabsone et al., 2016), the objective well-being level of this administrative territory should not have extreme values, i.e. well-being index should be between medium high to medium low;
- 3) the functions carried out by municipality and offered services should be broad enough, which could provide with information about ability of municipality to affect different public well-being aspects;
- 4) there should be political and administrative management support in order to carry out in-depth study of municipality, which would allow to have manifold data.



Source: author's compilation, adapting Yin (2013)

Fig. 3. Set of sequential steps for case study analysis

Taking into consideration all the criteria set above, Salaspils municipality was chosen as appropriate Riga accompanying administrative territory, concerning the political will and will of

administration to analyse well-being level in municipality as well as ability of municipality to improve it.

Table 1

The description of main well-being indicators in Salaspils municipality

| Well-being indicator (number of answers) | Situation in Salaspils* | Description of situation in Salaspils |
|--|-------------------------|--|
| "Education/ training" (249) | Medium | There are compliant educational institutions and high-quality schools in sufficient numbers. |
| "Health" (234) | Bad | There is no access to high quality medical care and a good, qualified physician. |
| "Employment/ economic activity" (216) | Bad | Inadequate salaries. High taxes. Two adults cannot earn enough to be able to pay all expenses. |
| "Infrastructure" (178) | Bad | Bad infrastructure. There is no pedestrian crossing on the highway. |
| "Leisure/ culture/ sport" (177) | Good | Opportunity to engage in things like that you like. |
| "Family life/ relationship" (124) | Good | Family traditions and values are tended. |
| "Private activities and initiatives" (122) | Good | Possibility of organizing sports events, to take up the initiative, to adopt healthy lifestyle, to establish organizations. |
| "Alimentation" (96) | Bad | Available malnutrition. Insufficient funds until the next salary. |
| "Access to means of living" (85) | Bad | Inability to sustain yourself. |
| "Housing" (78) | Medium | Available residence. Good living conditions (warm, spacious dwelling). Available apartments for the disabled persons. |
| "Environmental equilibrium" (67) | Medium | Promotion of material recycling. There is a possibility to participate in joint work. Ecologically clean environment. Access to clean water reservoirs with the possibility of swimming. |
| "Management, finances and organization of municipality" (64) | Medium | Political life is poor, high levels of corruption. No cues for kindergartens. Insufficient attention to other security measures in the social field. Big bureaucracy. Formal participation in decision-making processes. |
| "Personal development" (63) | Medium | The possibility of self-improvement. Personal time devoted to hobbies and non-formal education. People feel the need for the development |
| "Commitment in society" (62) | Good | Helping others, donating, participating actively in the political decision-making processes. |
| "Physical safety" (60) | Medium | Preventive work for safety is carried out. The road safety is improved, including the safety of pedestrians. Salaspils is safe. |

*assessment of situation: very bad, bad, medium, good, very good

Source: Results of analysis of 25 homogenous groups in Salaspils – results gained from 3 meetings. September, 2010 until May 2011(from 2867 answers)

During the case study research in Salaspils municipality, the SPIRAL methodology for measurement of subjective well-being indicators was approbated based on Jekabsone & Sloka (2014). The methodology allowed building of different well-being indicators covering whole spectrum of well-being concept. All developed indicators were assessed by the citizens of municipality (from very good to very bad). By using focus group method, a total of 65 indicators was developed, main indicators of which are summarised in Table 1.

Main conclusions regarding the case study analysis (well-being indicators research) of Salaspils district municipality are as follow.

- Research results showed that well-being concept is complex, it contains various aspects – both material and immaterial (like ability to develop, build relationship, implement one's initiatives, to build constrictive dialogue with municipality – wide range of well-being indicators proves that).
- Municipality can affect different subjective well-being aspects of its citizens (e.g. well-being indicator "Education/ training").
- Well-being of citizens of municipality is linked with ability to get involved in decision making process (well-being indicator "Management, finances and organization of municipality").

3. Development of the management guidance for the accompanying administrative territories

After analysing the experience of Salaspils district municipality, the recommendations for accompanying administrative territories of Riga were developed in the following areas:

- community platform or forming of the Local support group;
- defining the methodology for well-being evaluation and improvement;
- public involvement in decision-making and incorporation of principles of well-being promotion in development of municipal planning documents;

- public involvement in budget making process;
- citizen involvement in public services development.

Based on Salaspils municipality's experience for development of more effective dialogue between municipality and public, it is suggested to organise a union of public organisations, where the main non-governmental organisations, interest groups and associations of municipality would be represented (Local Support Group). In contrast to advisory councils, which are being convened upon solving particular issues, this union would have broader mandate – municipality would organise regular (once or twice a month) meetings with this union, they would have an opportunity to address unclear issue as well as to make proposals. In addition, during these meetings task force for organising certain activities would be formed, as well as results of such joint activities would be presented.

Municipalities have ability to directly influence the well-being of their citizens, providing services to them. In order to develop services, municipality citizens are satisfied with, it is necessary to involve them in development of these services. Usual practice in municipalities is to involve citizens in evaluation of services, however, in order to have a greater effect it would be necessary to engage public in earlier phases of service development – in planning, implementation and development.

It is important to involve public also in budgeting process, thereby ensuring implementation of financial accountability principles and confidence building towards municipality. It would be necessary to involve Local Support Group into this process, which provides its own proposals upon the budget topicalities of the upcoming year.

Conclusions, proposals, recommendations

- 1) In comparison with other administrative territories for municipalities of accompanying

administrative territories, it is very crucial to improve the dialogue with citizens, taking into consideration their strong links with the city (metropolis) and socio-economic development. Therefore, in order to improve social well-being, the management of accompanying territories shall be based on principles of public involvement, co-responsibility and reflective communication. Here it is important to have continuous political will for having public participation.

- 2) During the research, the methodology for the definition of accompanying administrative territories of Riga was provided. Based on the amount of inhabitants and intensity of commuting to Riga and reachability of the territories from Riga, 25 accompanying administrative territories of Riga were defined.
- 3) Within the scientific literature, there is a little focus on i.e. management of accompanying administrative territories. More often these territories are discussed from the territorial development point of view. In such situations when the problem in theoretical literature has been little explored, one of the best approaches is to develop a theory according to case study analysis that enables to form theoretical constructions, recommendations stemming from empirical data which are based on case study analysis.
- 4) During case study in Salaspils district municipality, the following answers to research questions were found
Does public involvement in decision-making influences the level of citizen well-being?
Study results showed that involvement in decision-making is one of the key subjective well-being indicators (14th place out of 65 subjective well-being indicators for Salaspils). Therefore, there is a sufficient ground to claim that citizen involvement in decision-making increases the level of well-being.
Which well-being aspects municipality should affect in promotion of higher level of well-

being? The study concerning Salaspils district municipality, where the link between the municipal functions and services and main subjective well-being indicators that were elaborated by citizens was analysed, showed that municipality should more focus on such sectors like improving of infrastructure, culture, sports and educational services, social and health services diversification. At the same time, paying attention to involving citizens in improving of those services, thereby contributing to the implementation of those initiatives and involvement society in taking of important municipal decisions, which are crucial aspects of subjective well-being, too.

- 5) The theses to be defended were confirmed. Management of accompanying administrative territories significantly affects the well-being of its citizens. The well-being indicator "Municipal management, finance and organization" has been rated as one of the most important indicators of subjective well-being (14th place out of 65 subjective well-being indicators in Salaspils municipality). In comparison to other administrative territories, for municipalities of accompanying administrative territories it is very crucial to improve the dialogue with citizens, taking into consideration their strong links with city (metropolis) and socio-economic development. Therefore, in order to improve social well-being, the management of accompanying territories should be based on principles of public involvement, co-responsibility and reflective communication. Here it is important to have continuous political will for having public participation.
- 6) The recommendations to Riga's accompanying administrative territories:
 - according to the proposed methodology, to establish a community platform or the Local Support Group, which would unite non-governmental organisations of municipality,

- leaders of interest groups and which could be used to establish a dialogue with public as well as involve them in implementation of particular activities, decision-making and development and improvement of services;
- to consider possibility of carrying out a subjective well-being study within a municipality; it would be advisable to implement such studies along with the development of the new Development planning programme (every 5-7 years) or election of new municipal council (every 4 years);
 - to include the principles of citizen well-being promotion in municipal planning documents;
 - to ensure citizen involvement in budgeting process;
 - to promote forming of community networks, strengthening of the current NGO capacity, as well as promoting the establishment of new NGOs.

The paper was supported by the National Research Program 5.2. EKOSOC-LV

Bibliography

1. Balockaite, R. (2012). Coping with the Unwanted Past in Planned socialist Towns: Visaginas, Tychy, and Nowa Huta. *SLOVO*, Volume 24, Issue 1, pp. 41-57.
2. Central Statistical Bureau (2013). Self-assessment of Latvian Municipalities. Retrieved: http://www.csb.gov.lv/sites/default/files/nr_39_latvijas_vietejo_pasvaldibu_pasvertejums_2013_13_00_lv.pdf Access: 03.01.2017
3. Edmondson, A. C., Bohmer, R. M., & Pisano, G. P. (2001). Disrupted Routines: Team Learning and New Technology Implementation in Hospitals. *Administrative Science Quarterly*, Volume 46, pp. 685-716.
4. Eisenhardt, K.M., Graebner, M.E. (2007). Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, Volume 50, Issue 1, pp. 25-32.
5. Galunic, D. C., & Eisenhardt, K. M. (2001). Architectural Innovation and Modular Corporate Forms. *Academy of Management Journal*, Volume 6, pp. 1229-1249.
6. Gilbert, C. G. (2005). Unbundling the Structure of Inertia: Resource versus Routine Rigidity. *Academy of Management Journal*, Volume 48, pp. 741-763.
7. Golany, G. (1976). *New-town Planning: Principles and Practice*. New York: Wiley, p. 414.
8. Yin, R. K. (2013). *Case Study Research: Design and Methods* (5th Ed.). Thousand Oaks, CA: Sage.
9. Young, C., & Kaczmarek, S. (2008). The Socialist Past and Post-socialist Urban Identity in Central and Eastern Europe: The Case of Lodz, Poland. *European Urban and Regional Studies*, Volume 15, pp. 53-70.
10. Jekabsone, I., Sloka, B., Grantins, A. (2016). Analysis of Well-being Indicators in Satellite Towns, Case of Latvia. In: *Proceedings of the 2016 International Conference "Economic Science for Rural Development"*, No 42, Jelgava, LLU ESAF, 21-22 April 2016, pp. 86-92.
11. Jekabsone, I., Sloka, B. (2014). The Assessment of Well-being in Context of Regional Development. *Economics and Business*, Volume 26, pp. 28-35.
12. Kissfazeckas, K. (2015). Relationships between Politics, Cities and Architecture Based on the Examples of Two Hungarian New Towns. *Cities*, Volume 48, pp. 99-108.
13. Liqueun, X., Junqing, Z. (2016). The New Town Development in Ecological Sensitive Area Based on Resilience Thinking. *Procedia - Social and Behavioral Sciences*, Volume 216, pp. 998 - 1005.
14. Mengyi, C. (2011). From Satellite Towns to New Towns, Evolution and Transformation of Urban Spatial Structure in Chinese Metropolises. Dissertation. Hong Kong: The University of Hong Kong, p. 85.
15. Merlin, P. (1980). New Town Movement in Europe. *The Annals of American Academy of Political and Social Science*, Volume 451, pp. 76-85.
16. Prasca, M., Olau, E. P. (2013). Urban Patterns of a Communist Industry. Case study: the New Towns of Beius Land, Romania. *Revista Romana de Geografie Politica*, Volume 15, Issue 1, pp. 66-75.
17. Rumbach, A. (2014). Do New Towns Increase Disaster Risk? Evidence from Kolkata, India. *Habitat International*, Volume 43, pp. 117-124.
18. State Regional Development Agency (2009). *Pasvaldibu raksturojums pec dazadam attistibu ietekmejosam pazimem* (The Description of Municipalities by Different Development Characteristics). Retrieved: <http://www.vraa.gov.lv/uploads/petnieciba/RAL-2009-6-7.pdf> Access: 03.01.2017
19. Thomas, W. (1997) The New Towns: Taking a Long-term View. *Town and Country Planning*, Volume 66, Issue 5, pp. 138-140.
20. Zamani, B., Arefi, M. (2013). Iranian New Towns and their Urban Management Issues: A Critical Review of Influential Actors and Factors, *Cities*, Volume 30, pp. 105-112.
21. Zyari, K. (2006). The Planning and Functioning of New Towns in Iran. *Cities*, Volume 23, Issue 6, pp. 412-422.

METHODOLOGY FOR THE DETERMINATION OF PERI-URBAN AREAS ON THE BASIS OF DATA OF LAND TYPE AND USE BY EXAMPLE OF THE TOWN OF TARTU

Evelin Jurgenson¹, MSc; Kristiin Sikk², MSc; Helena Hass³, MSc and Siim Maasikamae⁴, PhD

^{1,2,3,4} Estonian University of Life Sciences

Abstract. Development processes take place everywhere, but they are more observable in urban areas and peri-urban areas. Regulations for urban areas are usually well developed, but the situation is less clear for peri-urban areas. Peri-urban areas sometimes have land use conflicts, or competition for the land occurs. Meanwhile, it is quite problematic to determine where the peri-urban area ends and the rural area begins. The aim of the paper is to propose a method for the determination of the peri-urban areas around the town of Tartu according to data of land use types and land use. The study was carried out around the town of Tartu in Estonia. Ten buffer zones have been created; each buffer zone was two kilometres in width. Cluster analysis was used. It demonstrated that the first two zones differ from others and the width of the peri-urban areas around Tartu is about four kilometres.

Key words: peri-urban area; cluster analysis; Estonia.

JEL code: R11, Q15

Introduction

Urbanization, urban sprawl and changes in peri-urban areas are topics that have frequently been covered by different authors. Polarization of territory between urban and rural areas is still an important question. Quite often the authors handle the urbanization as a negative phenomenon because it represents an unfavourable impact on natural resources, economic health and community character (Wilson et al., 2003). The conflicts between agricultural use and other usages have also been discussed (Heimlich & Anderson, 2001; Maasikamae et al., 2011; Maasikamae et al., 2014).

The concept of peri-urban areas is nuanced. This area is neither urban nor purely rural in the traditional sense (OECD, 1979); it is a mixed area under urban influence but with a rural morphology (Caruso et al., 2001). Urbanization occurs when rural lifestyles are replaced by urban ones (Antrop, 2000). The parameters describing the peri-urban areas fall into different categories. It is possible to distinguish physical, social and economic aspects of variables that characterize the peri-urban areas (Budiyantini & Pratiwi, 2016).

The identification of the spatial context of peri-urban areas is complex and therefore it is problematic to determine where the urban settlement area ends and the peri-urban area

starts. Peri-urban areas have been spatially defined by different authors. For instance, Dutta (2013) has presented transformation classes between rural and urban areas as natural, rural, transitional and urban. Rakodi (1999) said that peri-urban areas are the transition zone between fully urbanised land in cities and predominantly agricultural areas. This type of area is characterised by mixed land uses and indeterminate inner and outer boundaries, and typically is split between a number of administrative areas. Ravetz et al. (2013) defines peri-urban areas as a new kind of multifunctional territory which is determined by relatively low population density, scattered settlements, high dependence on transport for commuting, fragmented communities and lack of spatial governance. According to the PLUREL project, the peri-urban area is defined as the area between the urban settlement and the rural hinterland (Piore et al., 2011).

The determination of peri-urban areas may depend on the usage of selected indicators. Several authors have used landscape metrics, socio-economic indicators or a combination of both (de Ferreiro et al., 2016; Budiyantini & Pratiwi, 2016).

Some previous studies exist on this topic for Estonia. For example, Roose et al. (2013) focused on land use policy directed at suburbanization on the basis of the spatial

analysis of land use. The spatial extent of urban development follows the borders of the five adjoining municipalities of Tartu, which were defined as a peri-urban zone. They used cartographic and landscape metrics analysis for exploring land use processes and dynamics. Additionally, they used master plans and thus the processes in the peri-urban zone can be well tracked.

One of the features of the peri-urban areas is that different land use types compete for land. For example, agricultural producers are interested in the continuation of farming, while real estate developers want to convert the agricultural land into built-up land. The peri-urban area is also vulnerable to uncontrolled development, which can have a negative impact on the use of agricultural land (Maasikamäe et al., 2011). Furthermore, the need to protect valuable agricultural land against vulnerable activities, including in peri-urban areas, has been under discussion in Estonia (Maasikamäe et al., 2014).

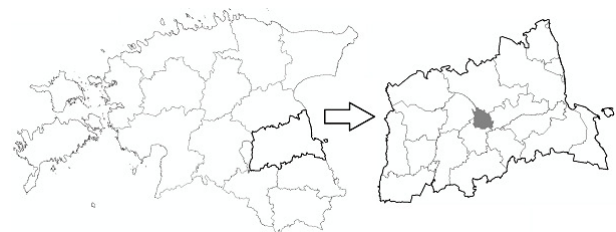
The geographical determination of peri-urban areas is challenging. For that reason, the focus of this study is on the physical aspect of the peri-urban areas. The data about land use types and land use have been analysed. The aim of the paper is to propose a method for the determination of the peri-urban area around the town of Tartu according to the data of land use types and land use. There are two research questions: *i*) is it possible to use cluster analysis for determination of the difference between peri-urban and rural areas around the town of Tartu, and *ii*) are there some differences between land use types and land use in peri-urban and rural areas around the town of Tartu?

The paper is structured as follows: first, the methodology of the study is introduced; second, the result and discussion are provided; third, the conclusion, proposals and recommendations are presented.

Methodology

The study was carried out using the surroundings of the town of Tartu in Estonia. ArcGIS and Statistica (version 13) software were used for the study.

Tartu is situated in Southern Estonia. The location of the study area is presented in Figure 1. Tartu, with its population about 100,000 in an area of 38.9 square kilometres, is the second largest city in Estonia. The urban area of Tartu consists of the central city of Tartu and of five neighbouring parishes. The population of Tartu's urban area is 120,929 (2014), of which 81 % live in the town of Tartu. The population of the area has been growing particularly in suburban areas. According to the analysis of the demographic development in the past 20 years, Tartu has undergone a process of demographic decentralization and suburbanization (City of Tartu, 2015).



Source: author's compilation based on the Estonian Topographic Database

Fig. 1. Location of the town of Tartu

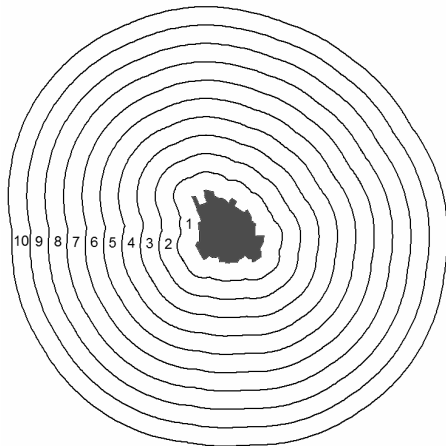
The implementation of cluster analysis for the determination of the differences between peri-urban and rural areas was the main idea of the methodology. It was assumed that the indicators that describe the land use types and land use in the peri-urban area differ from rural area. Furthermore, it was predicted that the cluster analysis would make separate clusters for peri-urban and rural areas.

For that purpose, the first 10 buffer zones were created around the town of Tartu. The width of the zones is two kilometres. The schematic location of the buffer zones around the town of Tartu is presented in Figure 2.

The following digital maps from the Estonian Land Board were the main data sources for

calculation of the indicators that described the data about land use types and land use characteristics in particular zones:

- the Estonian Topographic Database provided data about the land use types (on 01.01.2016);
- the map of cadastral boundaries provided data about location of boundaries and the intended purpose of the parcels (on 01.01.2016).



Source: author's compilation based on the Estonian Topographic Database

Fig. 2. Buffer zones around the town of Tartu

For the characterization of land use types and land use by zones, all land objects (for example, parcels) were related to a particular zone. However, it happened that some objects were locating simultaneously in two zones because the zone boundaries and object boundaries did not match exactly. The belonging of objects to a particular zone has been determined by the location of their centroids in the zones.

The competition for land between agricultural land use and non-agricultural land use is characteristic for the peri-urban areas. For that reason the main indicators that characterised the use of agricultural land (e.g. percentage of arable land) were selected on the one hand. The indicators that characterised the built-up land (e.g. percentage of residential land) and transportation land were used in the study on the other hand.

The indicators of the zones surrounding the town of Tartu can be divided into two groups. The first group of indicators has been used for cluster

analysis and the following indicators for each zone were calculated:

- percentage of profit-yielding land (hereinafter AFL.rat);
- percentage of residential land (hereinafter REL.rat);
- percentage of transportation land (hereinafter TRL.rat);
- percentage of arable land (hereinafter ArL.rat);
- average size of the profit-yielding land parcels (hereinafter AFL.area);
- average size of the residential land parcels (hereinafter REL.area);
- average size of the arable land plots (hereinafter ArL.area);
- density of the road network (km/km^2) (hereinafter DeRN).

The percentage of profit-yielding land (AFL.rat), the percentage of residential land (REL.rat) and the percentage of transportation land (TRL.rat) were calculated by dividing the total area of parcels of particular type of intended purpose of land in the zone by the total area of that zone and multiplying by 100. Formula 1 describes the general procedure for those calculations.

$$X.rat = S.cad / S.zone \times 100 \quad (1)$$

Where:

X.rat is the percentage of land of intended purpose in the zone (AFL.rat, REL.rat or TRL.rat);

S.cad is the total area of parcels of a particular type of intended purpose of land in the zone and

S.zone is the total area of a particular zone.

A similar procedure has been implemented for calculation of the percentage of arable land in the zones (ArL.rat). The only difference is that the total area of arable land in the zones has been used instead of the total area of parcels of a particular type of intended purpose of the land. Data from the Estonian Topographic Database have been used for determination of the area of arable land in the zones.

The arithmetic means of the average size of the profit-yielding land parcels (AFL.area) and the average size of the residential land parcels (REL.area) has been calculated by zone and by the type of intended purpose. The data were obtained from the digital map of cadastral boundaries.

Estonian Topographic Database data have been used for the determination of an average area of the arable land plots (ArL.area). The arable land plot is an area of arable land that is delimited by other types of land (e.g. forest), by roads, ditches, or other linear objects. The average areas of arable land plots have been calculated by zone as the simple arithmetic means.

Estonian Topographic Database data have also been used for the determination of the density of the road network (DeRN). The total length of state and local roads in zones was divided by the total area of those zones.

The second group of indicators have been used only for the comparison of the cluster analysis results. This group of indicators consists of the following indicators:

- percentage of the business and production land in the zones (hereinafter BPL.rat);
- average size of the business and production land parcels (hereinafter BPL.area);
- the average compactness of profit-yielding land parcels (hereinafter comp.AFL);
- the average compactness of the residential land parcels (hereinafter comp.ReL);
- the average compactness of the business and production land parcels (hereinafter comp.BPL).

The percentage of the business and production land in the zones (BPL.rat) has been calculated using the same rule as the percentage of the profit-yielding land (AFL.rat), the residential land (REL.rat) and the transportation land (TRL.rat), according to Formula 1. The average size of the business and production land parcels (BPL.area) has been calculated by zone

as the arithmetic means of areas of parcels of that type of intended purpose of the land.

The coefficient of compactness describes the shape of plots. Formula 2 has been used for the calculation of the compactness of each parcel.

$$K = P / \sqrt{4 \times S} \quad (2)$$

Where:

K is the coefficient of compactness of the parcel;

P is the actual perimeter of the parcel and

S is the area of the parcel.

The necessary data for determination of the coefficients of compactness have been obtained from the map of cadastral parcels boundaries.

The average indicators of compactness (comp.AFL, comp.ReL and comp.BPL) have been calculated by zone as a simple arithmetic means of coefficient of compactness of the parcels of particular type.

The K-mean clustering technique has been used for detection of (for distinguishing) the peri-urban and rural areas. The final number of clusters was set to two. All data for the cluster analysis have been standardized because of the different scales of different indicators.

The cluster analysis has been carried out in two variants. All eight indicators were included for the first variant of the cluster analysis. Five indicators have been used for the second variant of cluster analysis. Percentage of arable land in the region (ArL.rat) and the average area of the arable land plot (ArL.area) were excluded from analysis because of the relatively small differences in the means of those clusters. The graphical plot of the means of clusters (one of the outcomes of the cluster analysis in the Statistica software) has been used for the evaluation of the differences of the mentioned means. The density of the road network in the region (DeRN) was excluded from the analysis because this indicator described the transportation and traffic conditions as the percentage of transportation land in the region (TRL.rat).

Finally, the values of different indicators have been calculated for peri-urban and rural areas. Those values of indicators allowed the land-related characteristics of peri-urban and rural areas to be compared. The calculated indicators for the comparison of peri-urban and rural areas can be divided into two types. The first type of indicators was computed by dividing the total area of a particular land use type (for example, total area of arable land in the region) with the total area of that region. The percentage of profit-yielding land in the region is an example of that type of indicator. It is not possible to use the tests for evaluation of the statistical significance of the differences between such indicators calculated for different regions.

For some indicators, for example, the average area of a residential land parcel, it is possible to use the tests for the evaluation of the statistical significance of the differences between peri-urban and rural areas. The results of the comparison of the peri-urban and rural areas are presented in separate tables. If applicable (Table 2), the statistical significance level has been set to $\alpha=0.05$.

Research results and discussion

The main result of the cluster analysis is the division of the zones around the town of Tartu into two clusters. Zones one and two formed the first cluster and the remaining zones (3-10) constituted the second cluster. The results were the same in both variants of clustering. However, the results of the clustering show only that zones one and two around the town of Tartu differ from the other zones (3-10) according to the clustering indicators. The comparison of different indicators that describe the land use type and use in the peri-urban and rural areas gives more information about the clustering results. Table 1 and Table 2 present indicators which describe land use type and use in the peri-urban and rural areas. Beside the indicators that have been used for clustering, Table 1 and Table 2 contain some indicators that have not been used for clustering.

The comparison of indicators that have not been used for clustering shows that the peri-urban and rural areas can differ by more indicators than those that have been used for clustering. It is additional evidence that the land use type and use in peri-urban and rural areas is different.

Table 1 presents the indicators for which it is not possible to implement tests for the evaluation of the statistical significance of differences between comparable indicators.

Table 1

General indicators describing land use type and use in peri-urban and rural areas

| No | Indicator | Peri-urban area (zones 1 and 2) | Rural area (zones 3 to 10) |
|----|---|---------------------------------|----------------------------|
| 1 | Percentage of profit-yielding land | 65.45 | 88.25 |
| 2 | Percentage of residential land | 10.34 | 2.21 |
| 3 | Percentage of transportation land | 4.85 | 1.31 |
| 4 | Percentage of arable land | 45.17 | 38.42 |
| 5 | Density of road network (km/km ²) | 2.85 | 2.04 |
| 6 | Percentage of business and production land | 3.91 | 0.64 |

Source: author's calculations based on Estonian Land Board data

The comparison of indicators in Table 1 shows that the land use type pattern in the peri-urban area is less agriculture oriented than in the rural area. The percentage of profit-yielding land in the peri-urban area is less than in the rural area. Profit-yielding land consists of agricultural and forest land. In contrast, the values of other indicators in Table 1 (rows 2-6) are higher for the peri-urban area than for the rural area. This means that in the peri-urban area there is more residential, business and production land and there is a denser road network than in the rural area. Moreover, it is necessary to notice that the percentage of arable land in the peri-urban area is higher than in the rural area. The possible explanation of that phenomenon is that the ratio of forestland is higher and the ratio of arable land is lower in rural areas.

The differences in five out of seven indicators for the peri-urban area and for the rural area are statistically significant. The average size of the profit-yielding land parcels, the average size of the residential land parcels and the average size of the business and production land parcels (rows 1, 2 and 4 in Table 2) are less in the peri-urban

area than in the rural areas. It means that the land use pattern in peri-urban areas is more fragmented – the parcels are smaller. However, the difference between the average area of arable land plots in the peri-urban areas and in the rural areas (row 3 in Table 2) is not statistically significant.

Table 2

The average indicators describing land use type and use in the peri-urban and rural areas

| No | Indicator | Peri-urban area (zones 1 and 2) | | Rural area (zones 3 to 10) | | t- stat | p-value |
|--|---|---------------------------------|---------------|----------------------------|---------------|---------|---------|
| | | Avg. | No. of obser. | Avg. | No. of obser. | | |
| The indicators included in the cluster analysis | | | | | | | |
| 1 | Average size of the profit-yielding land parcel (ha) | 7.72 | 1375 | 11.23 | 12739 | 2.56 | 0.011 |
| 2 | Average size of the residential land parcel (ha) | 0.26 | 6217 | 0.52 | 6861 | 31.85 | 0.000 |
| 3 | Average area of the arable land plot | 11.90 | 608 | 12.17 | 5122 | 0.27 | 0.786 |
| The indicators not included in the cluster analysis | | | | | | | |
| 4 | Average size of the business and production land parcel (ha) | 0.69 | 900 | 0.91 | 1138 | 2.97 | 0.003 |
| 5 | The average compactness of profit-yielding land parcels | 1.23 | 1375 | 1.24 | 12739 | 1.94 | 0.052 |
| 6 | The average compactness of the residential land parcels | 1.06 | 6217 | 1.11 | 6861 | 16.41 | 0.000 |
| 7 | The average compactness of the business and production land parcels | 1.08 | 900 | 1.21 | 1138 | 5.77 | 0.000 |

Source: author's calculations based on Estonian Land Board data

The shape of the parcels is one of the indicators that also characterises land use patterns. The residential land parcels and the business and production land parcels (rows 6 and 7 in Table 2) are more compact in peri-urban areas than in rural areas. The possible explanation for that phenomenon is that the residential land parcels and the business and production parcels in peri-urban areas are more frequently the results of planning activities. The boundaries of residential land parcels in rural areas are not generally determined by planning activities.

It is necessary to notice that the difference between the compactness of profit-yielding land parcels in peri-urban areas and in rural areas is not statistically significant (row 5 in Table 2). The average area of an arable land plot in the peri-urban area is 11.90 hectares and 12.17 hectares

in rural areas. It can be supposed that the area of the agricultural land plots can be bigger 20 kilometres or more from the town of the Tartu.

The results of the study showed that cluster analysis as a method could be used for delimitation of the areas around town (peri-urban areas) and rural areas. However, this study has some limitations and there are questions that need further researching.

The width of buffer zones around Tartu was set at two kilometres. This was done on the basis of an expert opinion. It is possible to increase or to decrease the width of buffer zones. Both options are technically possible and both options have their advantages and disadvantages.

The decrease of the width of buffer zones gives (at least theoretically) the possibility to determine more precisely the boundary between the peri-urban area and the rural area. In the

present study, this precision was two kilometres. In theory, it was possible to get the width of peri-urban areas with increments of two kilometres (2, 4, 6 kilometres and so on). The decrease of the width of buffer zones, for example, to one kilometre would improve the precision of the determination of the boundary between peri-urban areas and rural areas.

The decreasing of the width of buffer zones has two consequences that should be kept in mind. First, the amount of necessary calculations will increase. The second issue is about the determination of the belonging of different land objects, for example, parcels to the particular zone. The problem is that some objects can be located simultaneously in two or more zones as has been explained in the methodology part of the paper. The number of objects that will be located in neighbouring zones simultaneously will increase if the width of zones decreases.

The question of the precision of the detection of the boundaries between peri-urban and rural areas is an important issue for future studies. It is clear that there is no distinct line on the field that is separating peri-urban and rural areas. However, such kind of imaginary separation will be needed for some purposes. Knowing this line can be important, for example, for researching real estate development processes or for planning purposes.

The maximal width of the study area around towns is also an issue for discussion. In this study, the total width of all zones was 20 kilometres, in order to avoid the impact of other towns. The question can be asked: will it improve the quality of the results if the study area is extended? This can also be an issue for future studies.

In this study, the determination of the peri-urban areas was based on the indicators that described different land use types and use

characteristics. It is possible to use different indicators, which can be physical, social and economic (Budyantini & Pratiwi, 2016). However, it is not so easy to use some data, for example, population density or number of enterprises, by buffer zone if the width of the zone decreases. For example, Statistics Estonia (<https://estat.stat.ee/StatistikaKaart/VKR>) provides digital maps of population density by squares of one kilometre by one kilometre. There can be problems with the precision of the determination of the population density for the whole buffer zone if both the unit on the population density map and the width of buffer zones are equal.

The investigation of the surroundings of other towns of Estonia is also an important topic for future studies. The result of this study can be the basis for the subsequent studies. The scope of such studies is wide and diverse.

Conclusions, proposals, recommendations

- 1) The results of the study showed that cluster analysis could be used for the determination of differences between the peri-urban and rural areas.
- 2) According to this method, the width of peri-urban areas around Tartu is about four kilometres.
- 3) The comparison of the indicators in peri-urban and rural areas around the town of Tartu verified that indicators of land use type and use in peri-urban and rural areas are different.
- 4) This method is quite simple. It is feasible to implement it around the other towns in Estonia (and in Europe). It can also be used as a tool to monitor changes. It is possible to compare data for the peri-urban area and rural area in different years.
- 5) It is possible to improve methodology and extend the spectrum of parameters for comparing the study results.

Bibliography

1. Antrop, M. (2000). Changing Patterns in the Urbanized Countryside of Western Europe. *Landscape Ecology*, Volume 15, Issue 3, pp.257–270.
2. Budiyanitini, Y. and Pratiwi, V. (2016). Peri-urban Typology of Bandung Metropolitan Area. *Procedia - Social and Behavioral Sciences*, No. 227, pp.833–837.
3. Caruso, G. (2001). Peri-urbanisation: The Situation in Europe. A bibliographical note and survey of studies in the Netherlands, Belgium, Great Britain, Germany, Italy and the Nordic countries. Report prepared for the Delegation a l'Amenagement du Territoire et a l'Action Regionale, (DATAR), Ministere de l'Amenagement du Territoire et de l'Environnement, France. Retrieved: http://publications.uni.lu/bitstream/10993/10153/1/Caruso_PeriUrbanEuropeDATAR.pdf. Access: 04.01.2017
4. City of Tartu. (2015). *Implementation Lab Dossier, Tartu: Connecting Tartu City Centre and Raadi Area, 2-5 JUNE 2015*. Retrieved: http://www.iinstitut.nl/sites/default/files/2015_%20Tartu/Final-Report/IL-TARTU-part-2-Final-report-Study-case-dossier-29_05_15.pdf. Access: 05.01.2017
5. Dutta, V. (2013). Land Use Dynamics and Peri-urban Growth Characteristics: Reflections on Master Plan and Urban Suitability from a Sprawling North Indian City. *Environment and Urbanization Asia*, Volume 3, Issue 2, pp.277–301.
6. de Ferreiro, M.F., Santos, S., Costa, P, Costa Pinto, T. and Colaco, C. (2016). *Socio-Economy of Peri-Urban Areas: The Case of Lisbon Metropolitan Area*. In: B. Maheshwari, V. P. Singh, & B. Thoradeniya, eds. *Balanced Urban Development: Options and Strategies for Liveable Cities*. Springer, pp. 111–122.
7. Heimlich, R.E. and Anderson, W.D. (2001). *Development at the Urban Fringe and Beyond: Impacts on Agriculture and Rural Land*. Retrieved: https://www.ers.usda.gov/webdocs/publications/aer803/19084_aer803_1_.pdf?v=41061. Access: 12.12.2016
8. Maasikamäe, S., Hass, H. and Jürgenson, E. (2011). *The Impact of Uncontrolled Development on the Use of Arable Land*. In: The Fifth International Scientific Conference: Rural Development 2011, PROCEEDINGS Volume 5, Book 2, pp.446–451.
9. Maasikamäe, S., Jürgenson, E., Mandel, M. and Veeroja, P. (2014). Determination of Valuable Agricultural Land in the Frame of Preparation of Countywide Spatial Plans: Estonian Experiences and Challenges. In *Economic Science for Rural Development: International Scientific Conference on Economic Science for Rural Development*, No. 36, pp. 77–85.
10. OECD. (1979). *Agriculture in the Planning and Management of Peri-urban Areas*. Volume 1: synthesis. Paris, p. 94.
11. Piorr, A., Ravetz, J. and Tosics, I. (2011). *Peri-Urbanisation in Europe. Towards European Policies to Sustain Urban-Rural Future*. University of Copenhagen/Academics Books Life Sciences. Retrieved: http://www.plurel.net/images/peri_urbanisation_in_europe_printversion.pdf. Access: 14.12.2015
12. Rakodi, C. (1999). *Poverty and Wellbeing in the Peri-Urban Interface of Developing Country Cuties: A Review*. Retrieved: <https://assets.publishing.service.gov.uk/media/57a08d9740f0b652dd001a6a/PD070FTR.pdf>. Access: 14.12.2016
13. Ravetz, J., Fertner, C. & Nielsen, T.S. (2013). *The Dynamics of Peri-Urbanization*. In: *Peri-urban futures: Scenarios and models for land use changes in Europe*. Springer, pp. 13–29.
14. Roose, A., Kull, A., Gauk, M. and Tali, T. (2013). Land Use Policy Shocks in the Post-communist Urban Fringe: A Case Study of Estonia. *Land Use Policy*, Volume 30, Issue 1, pp.76–83.
15. Wilson, E.H., Hurd, J. D., Civco, D. L., Prisloe, M. P. and Arnold, C. (2003). Development of a Geospatial Model to Quantify, Describe and Map Urban Growth. *Remote Sensing of Environment*. Volume 86, Issue 3, pp. 275–285.

E-GOVERNMENT AND E-PARTICIPATION DEVELOPMENT IN BALTIC STATES: COMPARISON OF ESTONIA, LATVIA, LITHUANIA

Natalija Kostrikova¹, MBA; **Baiba Rivza**², Dr.habil.oec

^{1,2} Latvia University of Agriculture

Abstract. E-government and e-participation are inherent parts of modern societies and economies. Each country chooses its own path of development depending on or influenced by certain socio-economic indicators as well as political will. The **aim** of the current research was to find socio-economic differences in e-government and e-participation development patterns in the three Baltic States – Estonia, Latvia and Lithuania. The following research **methods** were applied: 1) descriptive statistics to compare levels of e-government and e-participation in the three countries; 2) correlation analysis to find relationships between socio-economic indicators and indicators of e-government and e-participation in the three countries. The current research put forward two **hypotheses**: H1: Estonia, Latvia and Lithuania have different dynamics in e-government and e-participation development. H2: Estonia, Latvia and Lithuania have different patterns of interconnections between socio-economic indicators and e-government and e-participation development. The research confirmed both hypotheses and suggested the following proposals based on research results: 1) to facilitate e-government and e-participation development in Latvia authorities should stress efforts on measures increasing economic competitiveness and curbing corruption; 2) to facilitate e-government and e-participation development in Lithuania authorities should stress efforts on measures supporting national income growth; 3) to facilitate e-participation development in Estonia authorities should stress efforts on measures supporting national income growth.

Key words: E-government, E-participation, Estonia, Latvia, Lithuania.

JEL code: C01, H11, L86, O11

Introduction

There is a positive global trend towards higher levels of e-government development as countries in all regions are increasingly embracing innovation and utilizing ICTs to deliver services and engage people in decision-making processes (UNDESA, 2016). The rapid diffusion of ICTs gives rise to new business models and revolutionizes industries, bearing great promise for a future wave of innovations that could drive longer-term growth (Schwab and Sala-i-Martin, 2015).

Since e-government and e-participation are recent developments in modern societies, those areas suffer from the lack of aggregated and standardized evidence for comparing countries. Though some research papers investigated patterns of e-government and e-participation in different countries, none of them focused on the comparison of the three Baltic States.

The **aim** of the current research is to find socio-economic differences in e-government and e-participation development patterns in the three Baltic States – Estonia, Latvia and Lithuania.

The following research **tasks** were set: 1) to gather and analyse quantitative and qualitative data about e-government and e-participation levels in the three Baltic States 2) to analyse the relationships between selected socio-economic indicators and e-government and e-participation levels in the three Baltic States.

The current research puts forward the following **hypotheses**.

H1: Estonia, Latvia and Lithuania have different dynamics in e-government and e-participation development.

H2: Estonia, Latvia and Lithuania have different patterns of interconnections between socio-economic indicators and indicators of e-government and e-participation development.

The following **research methods** were applied: 1) descriptive statistics to compare levels of e-government and e-participation in three countries; 2) correlation analysis to find relationships between socio-economic indicators and indicators of e-government and e-participation in three countries; 3) critical analysis of qualitative information.

The following **research materials** were used:

- 1) United Nations' E-Government Surveys;
- 2) European Commission's E-Government Benchmark Studies;
- 3) World Economic Forum's Global Competitiveness Reports;
- 4) Transparency International's Corruption Perceptions Index Reports;
- 5) datasets with indicators from the World Bank, the World Economic Forum, the United Nations, the European Commission, and Transparency International.

There are several indices used by multilateral institutions to assess levels of e-government and e-participation.

The United Nations uses two key indicators in its E-government surveys.

- E-government-development index (EGDI) is used to measure the readiness and capacity of national administrations to use ICT to deliver public services consisting of:
 - 1) Telecommunication Infrastructure component;
 - 2) Online Service component and
 - 3) Human Capital component.
- E-Participation Index (EPI) measures e-participation according to a three-level model of participation that includes:
 - 1) e-information – provision of information on the Internet;
 - 2) e-consultation – organizing public consultations online; and
 - 3) e-decision-making – involving citizens directly in decision processes.

The European Commission uses four key indicators in its E-government benchmark studies.

- User Centricity benchmark assesses the availability and usability of public e-services and examines awareness and barriers to use.
- Transparent Government benchmark evaluates the transparency of government authorities' operations and service delivery procedures and the accessibility of personal data to users.
- Cross Border Mobility benchmark measures the availability and usability of cross border services.

- Key Enablers benchmark assesses the availability of key enablers such as Single Sign On and eID functionalities.

Research results and discussion

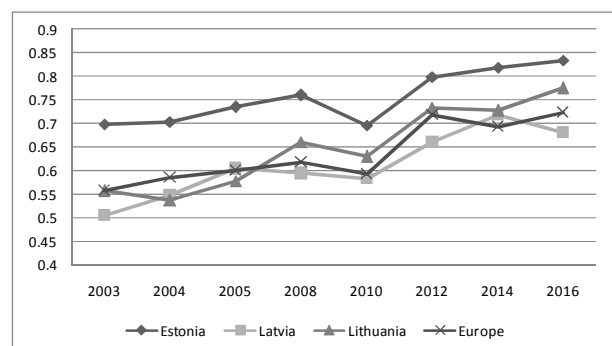
1. Comparison of e-government and e-participation levels in Estonia, Latvia, Lithuania

All the three countries have shown growth in EGDI from 2003 through 2016, however growth paths differed – direction of EGDI change was different in at least 2 out of 7 cases observed for each pair of countries (Figure 1).

EGDI level of Estonia has been comfortably higher than Latvia's, Lithuania's and Europe's average during all the 8 years observed. Estonian growth was mainly driven by Telecommunications Infrastructure Component (47.02 % growth) and to a lesser extent by Online Services component (38.85 % growth).

Latvia showed the lowest EGDI among the three Baltic countries in 6 out of 8 years observed and a lower EGDI level than Europe's average in 6 out of 8 years observed.

Among the three Baltic countries, Lithuania has made the biggest progress from 2003 through 2016 – EGDI has increased by 39.01 % (vs. 19.40 % in Estonia and 34.66 % in Latvia), driven by Telecommunications Infrastructure component (187.25 % growth).

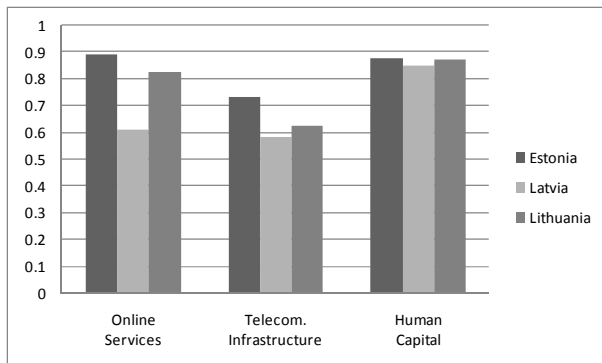


Source: UNDESA, 2003, 2004, 2005, 2008, 2010, 2012, 2014, 2016

Fig. 1. E-government development in Estonia, Latvia, Lithuania in the period 2003-2016, indices

In 2016 Estonia and Lithuania score "very high" (above 0.75) according to the UN classification while Latvia scores just "high" (between 0.5 and 0.75). Latvia's EGDI is mostly

lagging in the area of Online Services and to a lesser extent in the area of Telecommunications Infrastructure, while Human Capital component is almost at the same level in all the three countries (Figure 2).



Source: UNDESA, 2016

Fig. 2. E-government development components in Estonia, Latvia, Lithuania in 2016, indices

E-government development in the Baltic States has started from the adoption of the following policy documents:

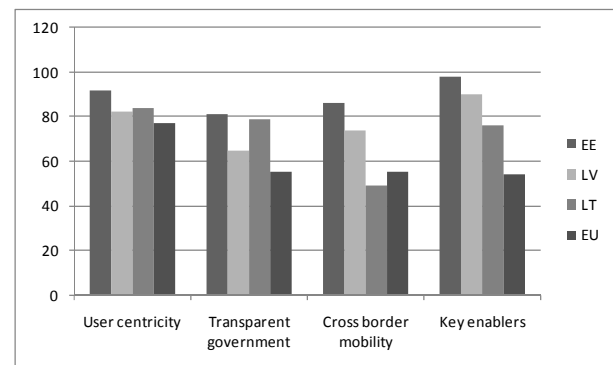
- In 1998 the Estonian Parliament approved the Estonian principles of the initial ICT policy, which served as a basis for making public policy decisions to support the rise of the information society on the basis of an action plan (EC, 2016).
- In July 2001, the Cabinet of Ministers of Latvia adopted the "Public Administration Reform Strategy 2001- 2006" that envisaged a uniform, purposeful and forward-thinking Public Administration whose objectives included achieving citizen involvement in state governance processes and providing high quality public services to citizens (EC, 2015).
- In February 2001, the Government of Lithuania approved the National Concept of Development of the Information Society, where it placed increased importance to e-government (EC, 2015).

Higher level of e-government in Estonia can be explained by the fact that e-government vision emerged much earlier in Estonia than in Latvia and Lithuania, even before official adoption of strategic policy papers and e-initiatives. In 1993, a strategy paper was prepared by the IT

community for establishing foundations and principles for the management of modern, well-functioning state information systems (Sirendi, 2013). In 2001, Estonia introduced an X-road data exchange layer that allowed the nation's various e-services databases, both in the public and private sector, to link up and operate in harmony (E-estonia, 2016).

Estonia introduced its Electronic ID card program in 2002 and by far it is the most highly-developed national ID card system in the world (E-estonia, 2016). By contrast, Lithuania introduced electronic ID cards in 2009 and Latvia was the last Baltic country to introduce electronic ID cards in 2012.

The EC E-government benchmark study in 2015 confirms Estonian leadership in all e-government aspects assessed (Figure 3).



Source: The European Commission, 2016

Fig. 3. E-government benchmarks in Estonia, Latvia, Lithuania in 2014-2015, indices

It also indicates that among the three countries Latvia substantially lags in the area of Transparent Government whilst Lithuania substantially lags in the area of Cross Border Mobility and to a lesser extent in the area of Key Enablers. Almost all benchmarks in all countries are above the EU average. The only exception is a Cross Border Mobility benchmark in Lithuania that is slightly lower than the EU average.

Estonia has been at the forefront of online public services for a few years and is the best performing country in Europe in 2015 with 80 % share of e-government users (EC DG COMM, 2016). The use of digital services in Estonia saves around 2.8 million hours of work in a year,

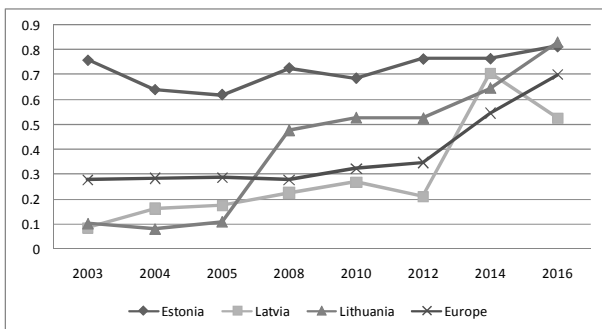
meaning that every year e-services save an amount equal to 2 % of the GDP (Siil, 2014).

In Latvia, there has been a positive growth in the number of e-government users in 2015 with a 36 % share surpassing the EU average of 32 % (EC DG COMM, 2016), however, still below the levels of Estonia and Lithuania.

Lithuania has made progress towards increasing its uptake of e-government with 42 % share of e-government users, however the country has been lagging behind in the dimension of Open Data (EC DG COMM, 2016).

E-Participation is about fostering civic engagement and open, participatory governance through ICTs with an objective to improve access to information and public services as well as to promote participation in policy-making, both for the empowerment of individual citizens and the benefit of society as a whole (UNDESA, 2016).

All the three countries have shown growth in EPI from 2003 through 2016, however growth paths differed – direction of EPI change was different in at least 2 out of 7 cases observed for each pair of countries (Figure 4).



Source: UNDESA, 2003, 2004, 2005, 2008, 2010, 2012, 2014, 2016

Fig. 4. E-participation in Estonia, Latvia, Lithuania in the period 2003–2016, indices

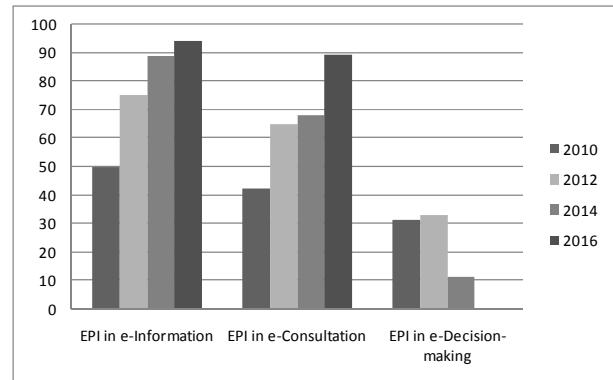
Among the three Baltic countries, Lithuania has made the biggest progress from 2003 through 2016 – EPI has increased by 703.19 % (vs. 7.25 % in Estonia and 509.51 % in Latvia).

Since 2003 through 2014, EPI level of Estonia has been higher than Latvia's, Lithuania's and Europe's average.

Only in 2016 Estonian EPI was outperformed by Lithuanian EPI, mainly driven by e-participation in e-consultation (64.07 % growth)

and emergence of e-participation in e-decision-making.

Estonian EPI has mainly been driven by e-participation in e-information and e-consultation whilst e-participation in e-decision-making has historically been much lower and even reached 0 in 2016 (Figure 5).



Source: UNDESA, 2010, 2012, 2014, 2016

Fig. 5. E-participation in e-Information, e-Consultation and e-Decision-making in Estonia in 2010, 2012, 2014 and 2016, %

Kitsing suggests that e-voting in Estonia has not made substantial contribution to online democratic participation other than making voting more convenient for certain segments of society, and the government portal for encouraging citizens to express their views about new laws suffers from both unwillingness of citizens to participate and most ministries to make new laws available (Kitsing, 2011).

Latvia showed the lowest EPI among the three Baltic countries in 5 out of 8 years observed and a lower EPI level than Europe's average in 7 out of 8 years observed.

Only in 2014 Latvian EPI outperformed Europe's average, but in 2016 it decreased again dragged down by lower e-participation in e-decision-making (35.64 % decline) and e-information (27.84 % decline).

2. Correlation analysis between socio-economic indicators and indicators of e-government and e-participation in Estonia, Latvia, Lithuania

A number of research papers have found relationships between the following socio-economic indicators and e-government and e-participation levels.

- Country's income is positively associated with the levels of e-government and e-participation (Azad et al, 2010; Das et al, 2011; Srivastava and Teo, 2008; UNDESA, 2016; Wilkinson and Cappel, 2005).
- Corruption is negatively associated with the level of e-government (Bertot et al, 2010; Corojan and Criado, 2012; Heeks, 1999; Kim, 2014; Elbahnasawy, 2014; Krishnan et al, 2013; Lupu and Lazar, 2015; Shim and Eom, 2008).
- Economic competitiveness is positively associated with the level of e-government (Dutta and Jain, 2005; Srivastava and Teo, 2010, UNDESA, 2016).
- E-participation is positively associated with the level of e-government (Krishnan et al, 2012).

A number of research papers have found no relationship between the following socio-economic indicators and e-government and e-participation levels.

- Governance is not significantly associated with e-participation and e-government maturity (Das et al, 2011; Krishnan et al, 2012).
- The relation between the E-participation index and indices of democracy and participation is non-existent (Gronlund, 2011).

Based on relations found in previous researches, the following socio-economic indicators were selected for the current research:

- Gross National Income (GNI) per capita, constant prices, local currency units (The World Bank, 2004-2016);
- Corruption Perceptions Index (Transparency International, 2002-2015);
- Global Competitiveness Index (The World Economic Forum (2006-2016).

To find interconnections between selected socio-economic indicators and E-government development indices and E-participation indices, the following time periods were applied:

- Base year (y_1) vs. base year (y_1);
- Base year (y_1) vs. preceding year (y_0);

- Base year (y_1) vs. following year (y_2).

The three countries show different patterns in interconnectedness of EGDI and GNI per capita (Table 1).

In Estonia, the strongest correlation (0.9317) is between base year's EGDI and base year's GNI per capita, meaning that those indicators evolve simultaneously and neither of the indicators has much stronger influence on each other (0.7804 vs. 0.7796).

Table 1

Correlations between EGDI and GNI per capita in Estonia, Latvia, Lithuania in 2003-2016

| EGDI in y_1 vs. | Estonia | Latvia | Lithuania |
|-------------------|---------|--------|-----------|
| GNI p.c. in y_1 | 0.9317 | 0.8075 | 0.9599 |
| GNI p.c. in y_0 | 0.7804 | 0.4932 | 0.9271 |
| GNI p.c. in y_2 | 0.7796 | 0.9638 | 0.9304 |

Source: Author's calculations based on USDESA data 2003-2016, and the World Bank data 2004-2015

In Latvia, the strongest correlation (0.9638) is between base year EGDI and following year GNI per capita meaning that EGDI has much stronger influence on GNI per capita rather than vice versa (0.9638 vs. 0.4932).

In Lithuania, there are equally strong correlations between base year's EGDI and: 1) base year's GNI per capita (0.9599); 2) preceding year's GNI per capita (0.9271); and 3) following year's GNI per capita (0.9304), meaning that EGDI and GNI per capita equally and strongly stimulate each other.

The three countries show slightly different patterns in interconnectedness of EGDI and CPI (Table 2).

Table 2

Correlations between EGDI and CPI in Estonia, Latvia, Lithuania in 2002-2016

| EGDI in y_1 vs. | Estonia | Latvia | Lithuania |
|-------------------|---------|--------|-----------|
| CPI in y_1 | 0.6890 | 0.9184 | 0.7837 |
| CPI in y_0 | 0.7557 | 0.7928 | 0.7612 |
| CPI in y_2 | 0.8728 | 0.9603 | 0.9231 |

Source: Author's calculations based on USDESA data 2003-2016 and Transparency International data 2002-2015

In all the three countries, the strongest correlation is between base year's EGDI and

following year's CPI, meaning that EGDI stimulates CPI to a greater extent rather than vice versa. Latvia has the strongest correlation (0.9603) in comparison to Lithuania (0.9231) and Estonia (0.8728).

The correlations between base year's EGDI and preceding year's CPI are also strong, but slightly weaker: 0.7928 in Latvia; 0.7612 in Lithuania; and 0.7557 in Estonia.

Among the three countries, Latvia has the strongest correlation between base year's EGDI and the base year's CPI (0.9184), meaning that EGDI and CPI evolve with the greatest coherence.

The three countries show similar patterns in interconnectedness of EGDI and GCI (Table 3).

Table 3

Correlations between EGDI and GCI in Estonia, Latvia, Lithuania in 2006-2016

| EGDI in y1 vs. | Estonia | Latvia | Lithuania |
|----------------|---------|--------|-----------|
| GCI in y1 | 0.8273 | 0.9582 | 0.8035 |
| GCI in y0 | 0.5533 | 0.8103 | 0.7234 |
| GCI in y2 | 0.1203 | 0.3422 | 0.3206 |

Source: Author's calculations based on USDESA data 2005-2016 and the World Economic Forum data 2006-2016

In all the three countries, the strongest correlation is between base year's EGDI and base year's GCI, meaning that those indicators evolve simultaneously. Latvia has the strongest correlation (0.9582) in comparison to Estonia (0.8273) and Lithuania (0.8035).

The correlations between base year's EGDI and preceding year's GCI are slightly weaker in Latvia (0.8103) and Lithuania (0.7234) and much weaker in Estonia (0.5533).

The correlations between base year's EGDI and following year's GCI are weak in all the three countries being equally weak - in Latvia (0.3422) and Lithuania (0.3206) and almost non-existent in Estonia (0.1203).

The three countries show different patterns in interconnectedness of EPI and GNI per capita (Table 4).

Correlations between EPI and GNI per capita in Estonia, Latvia, Lithuania in 2003-2016

| EPI in y1 vs. | Estonia | Latvia | Lithuania |
|----------------|---------|--------|-----------|
| GNI p.c. in y1 | 0.8752 | 0.6533 | 0.9273 |
| GNI p.c. in y0 | 0.9034 | 0.6369 | 0.9691 |
| GNI p.c. in y2 | 0.1579 | 0.7722 | 0.8912 |

Source: Author's calculations based on USDESA data 2003-2016, and the World Bank data 2004-2015

In Estonia, the strongest correlation (0.9034) is between base year EPI and preceding year GNI per capita, meaning that GNI per capita strongly stimulates EPI whilst EPI influence on following year's GNI per capita is almost non-existent (0.1579).

In Latvia, the strongest correlation (0.7722) is between base year EPI and following year's GNI per capita, meaning that EPI stimulates GNI per capita to a greater extent rather than vice versa (0.6369). However, the strongest correlation in Latvia (0.7722) is weaker than the strongest correlation in Estonia (0.9034) and Lithuania (0.9691).

In Lithuania, the strongest correlation (0.9691) is between base year EPI and preceding year's GNI per capita, meaning that GNI per capita strongly stimulates EPI whilst EPI influence on following year's GNI per capita is also strong but slightly weaker (0.8912).

The three countries show different patterns in interconnectedness of EPI and CPI (Table 5).

Table 5

Correlations between EPI and CPI in Estonia, Latvia, Lithuania in 2003-2016

| EPI in y1 vs. | Estonia | Latvia | Lithuania |
|---------------|---------|--------|-----------|
| CPI in in y1 | 0.0726 | 0.8000 | 0.7288 |
| CPI in y0 | 0.5829 | 0.8883 | 0.6684 |
| CPI in y2 | 0.1068 | 0.7079 | 0.5843 |

Source: Author's calculations based on USDESA data 2003-2016 and Transparency International data 2002-2015

In Estonia, the strongest correlation (0.5829) is between base year's EPI and preceding year's CPI, meaning that CPI moderately stimulates EPI whilst EPI influence on base year's CPI and

following year's CPI is almost non-existent (0.0729 and 0.1579 accordingly).

In Latvia, the strongest correlation (0.8883) is between base year's EPI and preceding year's CPI, meaning that CPI strongly stimulates EPI whilst EPI influence on following year's CPI is weaker (0.7079).

In Lithuania, the strongest correlation (0.7288) is between base year's EPI and base year's CPI, meaning that those indicators evolve simultaneously, whilst CPI has slightly more influence on EPI rather than vice versa (0.6684 vs. 0.5843).

The three countries show slightly different patterns in interconnectedness of EPI and GCI (Table 6).

Table 6

Correlations between EPI and GCI in Estonia, Latvia, Lithuania in 2006-2016

| EPI in y_1 vs. | Estonia | Latvia | Lithuania |
|------------------|---------|---------|-----------|
| GCI in y_1 | 0.8832 | 0.8768 | 0.8699 |
| GCI in y_0 | 0,5749 | 0,7586 | 0,7817 |
| GCI in y_2 | -0,4796 | -0,1208 | -0,0697 |

Source: Author's calculations based on USDESA data 2005-2016 and the World Economic Forum data 2006-2016

The strongest correlation in all the three countries is between base year's EPI and base year's GCI, meaning that those indicators evolve simultaneously. Estonia has the strongest correlation (0.8832) in comparison with Latvia (0.8768) and Lithuania (0.8699).

In Estonia, GCI moderately influences following year's EPI (0.5749), whilst EPI slightly drags down following year's GCI (-0.4796).

In Latvia, GCI strongly influences following year's EPI (0.7586), whilst the relationship between base year's EPI and following years GCI is almost non-existent (-0.1208).

In Lithuania, GCI strongly influences next year's EPI (0.7817), whilst the opposite relationship is almost non-existent (-0.0697).

The three countries show slightly different patterns in interconnectedness of EGDI and EPI (Table 7).

Correlations between EGDI and EPI in Estonia, Latvia, Lithuania in 2003-2016

| EGDI in y_1 vs. | Estonia | Latvia | Lithuania |
|-------------------|---------|--------|-----------|
| EPI in y_1 | 0.6855 | 0.7598 | 0.7895 |
| EPI in y_0 | 0.2048 | 0.6651 | 0.6423 |
| EPI in y_2 | 0.6845 | 0.8815 | 0.8245 |

Source: Author's calculations based on USDESA data 2003-2016

In Estonia, the strongest correlations are between: 1) base year's EGDI and base year's EPI (0.6855); and 2) base year's EGDI and following year's EPI (0.6845), meaning that EGDI has moderate influence on following year's EPI, whilst the opposite relationship is almost non-existent (0.2048).

In Latvia and Lithuania, the strongest correlations are between base year's EGDI and following year's EPI (0.8815 and 0.8245 accordingly), meaning that EGDI has strong influence on following year's EPI in both countries, whilst the opposite relationship is much weaker (0.6651 and 0.6423 accordingly).

Conclusions, proposals, recommendations

- 1) Estonia has historically been a leading country among the Baltic States in terms of e-government and e-participation development, driven by telecommunications infrastructure, online services, e-information and e-consultation development as well as earlier e-government policy planning and implementation; however, e-decision-making still suffers from the lack of e-participation.
- 2) Latvia has historically been the most lagging country among the Baltic States in terms of e-government and e-participation development, dragged down by online services, telecommunications infrastructure, e-information and e-decision-making development; Latvia also substantially lags in the area of transparent government in comparison with Estonia and Lithuania.
- 3) Lithuania has made the biggest progress in e-government and e-participation development

among the three Baltic countries, driven by telecommunications infrastructure and e-consultation development as well as emergence of e-decision-making.

- 4) Although all the three Baltic countries showed growth in both e-government and e-participation, growth patterns differed – the direction of both e-government and e-participation change was different in at least 2 out of 7 cases observed for each pair of countries, thus, H1 is confirmed.
- 5) E-government development strongly stimulates national income growth and e-participation development in Latvia and Lithuania and corruption decrease in all the three Baltic countries, whilst national income growth strongly stimulates e-government development in Lithuania and economic competitiveness increase strongly stimulates e-government development in Latvia.
- 6) E-participation development strongly stimulates national income growth in Lithuania, whilst national income growth strongly stimulates e-participation development in Estonia and Lithuania and corruption decrease strongly stimulates e-participation development in Latvia.
- 7) Although in all cases there were noted similar direction correlations between indicators of national income, corruption and economic competitiveness versus indicators of e-government and e-participation among the three Baltic countries, in most cases the

strengths of correlations substantially differed, meaning that neither of the three Baltic countries had similar patterns of interconnections between socio-economic indicators and indicators of e-government and e-participation combined. Thus, H2 is confirmed.

- 8) To facilitate e-government and e-participation development in Latvia authorities should stress efforts on measures increasing economic competitiveness and curbing corruption.
- 9) To facilitate e-government and e-participation development in Lithuania authorities should stress efforts on measures supporting national income growth.
- 10) To facilitate e-participation development in Estonia authorities should stress efforts on measures supporting national income growth.

Acknowledgements

The paper was financially supported by the Latvia National Research programme EKOSOC-LV.

Bibliography

1. Azad, B., Faraj, S., Goh J.M., Feghali T. (2010). What Shapes Global Diffusion of E-Government: Comparing the Influence of National Governance Institutions. *Journal of Global Information Management, Vol. 18*, p. 17
2. Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to Create a Culture of Transparency: E-government and Social Media as Openness and Anti-corruption Tools for Societies. *Government Information Quarterly, Vol. 27*, p. 269.
3. Cappel, J., Wilkinson, V. (2005). Impact of Economic Prosperity and Population on e-Government Involvement. *Issues in Information Systems, Vol. VI*, p. 208
4. Corojan, A., Criado, J. I. (2012). Handbook of research one-government in emerging economies: adoption, e-participation, and legal frameworks: E-government for transparency, anti-corruption, and accountability: challenges and opportunities for central American countries. Hershey, PA: *IGI Global*, p. 340.
5. Das, A., Singh, H., Joseph, D. (2011). A Longitudinal Study of E-Government Maturity. *Information & Management*, p. 11
6. Dutta, S., and Jain A. (2005). The Global Information Technology Report: An Analysis of the Diffusion of Information and Communication Technologies of Nations. *Geneva: World Economic Forum*, p. 12

7. EC DG Connect. Estonia (2016). Retrieved: <https://ec.europa.eu/digital-single-market/en/scoreboard/estonia> Access: 27.12.2016
8. EC DG Connect. Lithuania (2016). Retrieved: <https://ec.europa.eu/digital-single-market/en/scoreboard/lithuania> Access: 27.12.2016
9. EC DG Connect. Latvia (2016). Retrieved: <https://ec.europa.eu/digital-single-market/en/scoreboard/latvia> Access: 27.12.2016
10. E-Estonia. Electronic ID Card (2016). Retrieved: <https://e-estonia.com/component/electronic-id-card/> Access: 27.12.2016
11. E-Estonia. X-road. Retrieved: <https://e-estonia.com/component/x-road/> Access: 27.12.2016
12. Elbahnasawy, N. G. (2014). E-government, internet adoption, and corruption: an empirical investigation. *World Development*, Vol. 57, p. 122.
13. European Commission (2015). E-government in Latvia. Edition 17.0, p.16
14. European Commission (2016). E-government in Estonia. Edition 18.0, p. 20
15. European Commission (2015). E-government in Lithuania. Edition 17.0, p. 15
16. Gronlund, A. (2011). Connecting E-Government to Real Government - the Failure of the UN E-Participation Index. *EGOV'11 Proceedings of the 10th IFIP WG 8.5 International Conference on Electronic Government*, p. 36
17. Heeks, R. (1999). Information Technology and the Management of Corruption. *Development in Practice*, Vol. 9, p. 184.
18. Kim, C. K. (2014). Anti-corruption Initiatives and E-government: a Cross-national Study. *Public Organization Review*, Vol 14, p. 385.
19. Kitsing, M. (2011). Online Participation in Estonia: Active Voting, Low Engagement. Proceedings of the 5th International Conference on Theory and Practice of Electronic Governance, p. 20
20. Krishnan, S., Teo, T. S. H., Lim, V. K. G. (2013). Examining the Relationships among E-government Maturity, Corruption, Economic Prosperity and Environmental Degradation: a Cross-country Analysis. *Information & Management*, Vol. 50, p. 644.
21. Krishnan, S. (2014). Electronic Government Maturity: Antecedents and Consequences from a Global Perspective. Singapore: *National University of Singapore*, p. 60
22. Lupu, D., Lazar, C.G. (2015). Influence of e-Government on the Level of Corruption in Some EU and Non-EU States. *Procedia Economics and Finance*, p. 370
23. Sala-i-Martin, X., Schwab, K. (2015). The Global Competitiveness Report 2015-2016. Geneva: *World Economic Forum*, p. 3.
24. Shim, D. C., & Eom, T. H. (2008). E-Government and Anti-corruption: Empirical Analysis of International Data. *International Journal of Public Administration*, Vol. 31, p. 298.
25. Siil, R. (2014). Confessions of an E-Estonian. Retrieved: <http://creativeeconomy.britishcouncil.org/guide/confessions-e-estonian/> Access: 27.12.2016
26. Sirendi, R. (2013). Starting from Scratch: The Case of E-government in Estonia. Retrieved: <http://estonianworld.com/technology/starting-scratch-case-e-government-estonia/> Access: 27.12.2016
27. Srivastava, S.C., Teo, T.S.H. (2008). The Relationship between E-government and National Competitiveness: the Moderating Influence of Environmental Factors. *Communications of the Association for Information Systems Vol. 23*, p. 87.
28. Srivastava, S.C., Teo, T.S.H. (2010). E-Government, E-Business, and National Economic Performance, *Communications of the Association for Information Systems Vol. 26*, p. 278
29. Transparency International. *Corruption Perceptions Index*. Retrieved: <http://www.transparency.org/research/cpi/overview> Access: 13.12.2016
30. UNDESA. Citizen Engagement. Retrieved: <https://publicadministration.un.org/en/eparticipation> Access: 27.12.2016
31. UNDESA. UN E-Government Knowledge Database. Retrieved: <https://publicadministration.un.org/egovkb/en-us/Data-Center> Access: 13.12.2016
32. UNDESA (2016). United Nations E-government Survey 2016: E-government in Support of Sustainable Development, New York: *United Nations*, pp. 126, 220
33. UNDESA (2014). United Nations E-government Survey 2014: E-government for the Future We Want. New York: *United Nations*, p. 19
34. World Bank. World Development Indicators. Retrieved: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#> Access: 13.12.2016
35. World Economic Forum. GCI dataset. Retrieved: <http://reports.weforum.org/global-competitiveness-index/downloads/> Access: 03.01.2017

REGIONAL TOPICALITIES IN LATVIA: MOBILITY AND IMMOBILITY IN THE COUNTRYSIDE

Zaiga Krisjane¹, Dr.geogr., Professor; **Elina Apsite-Berina**¹, Dr.geogr. Researcher; **Maris Berzins**¹,
Dr.geogr., Docent; **Ineta Grīne**¹, Dr.geogr., Docent

¹University of Latvia, Faculty of Geography and Earth Sciences

Abstract. Rural areas throughout Europe experience continuous transformations in their natural and residential environments. Latvia, along with other East European countries, over the past two decades has witnessed the demographic and socioeconomic decline of many rural areas. Human mobility or relative immobility is inherently geographical in nature, not only in the sense of population movements across the space but also raises important questions about the socioeconomic development of particular place. Much of the recent geographical research on human mobilities has focused on urban areas. Less attention has been given to mobilities in the context of rural places. In this paper, we argue that mobility and immobility represents important component of rural lifestyles and places. The aim of the current study is to analyse mobility behaviour of rural residents with regard to population composition in the Latvian countryside. We draw on empirical materials from a survey of a survey of 802 rural households in Vidzeme and Latgale regions to reveal the nature of mobilities and related residential composition. Research results confirm the importance of human mobility as essential force contributing to rural decline. It was found that migration selectivity is stable but the composition and behaviour of migrants vary between highly mobile working age individuals mostly in Vidzeme and overrepresentation of elderly, economically non-active immobile population in Latgale.

Key words: human mobility, rural population, population composition, Vidzeme, Latgale.

JEL code: R110, J110

Introduction

In recent years, rural depopulation, regional marginalisation and substantial abandonment of the agricultural land draws attention of many researchers in Europe (Terres et al., 2015). The collapse of state socialism caused massive institutional and socioeconomic changes (Hann et al., 2003; Pallot and Nefedova, 2007; Owczarzak, 2009). Contemporary patterns of rural migration show an increase in diversification of population characteristics involved in migration (Wiest, 2016, Leibert, 2016; Krisjane et al., 2016, Ruskule, 2013). On the other hand, it has also been emphasized that rural places are characterised by a stability, rootedness, attachment to place and low rates of mobility (Cloeke and Thrift, 1990). Thus, relative immobility of rural population helps to explain the context (Fischer et al. 2000). Different regions within a country attract specific groups of in-migrants (Stockdale, 2014) and set characteristics for immobile part of population. Milbourne and Kitchen (2014) researching rural Wales urges geographers to concentrate on rural places as meeting point of complex migration

flows in various scales and temporalities. Recent studies show that central and Eastern Europe display higher risks of negative processes in rural parts of the countries compared to Western Europe (Terres et al., 2015; Moravec and Zemeckis, 2007).

Rural regions of Latvia deal with the depopulation problems over the past two decades, however, the problems apply to the general trends in the country, but more precisely can be observed in the rural context (Puzulis and Kule, 2016). Population distribution shows that 68 % live in urban areas whilst 32 % reside in rural parts of the country. There is a decrease of rural population since 1990 by 23.3 % and currently rural areas comprise 629.2 thousand inhabitants (CSB, 2016). The settlement pattern of remote countryside and peripheral areas corresponds to low population density and lack of economic activity. Current background of the rural development is set by the post-soviet heritage.

The collapse of the Soviet Union caused changes in spatial distribution of population that previously was affected by intense migration

processes. Characteristics of past decade include major flows of internal migration between urban and rural areas. The basic migration flows were from urban areas to countryside, while emigration from rural to urban areas constitutes almost equal numbers. In the 1990s, there was a short period of ruralisation, which was expressed in dominating population outflows from Riga and other major cities. The main reason why urban residents have been moving to the rural areas is that during socialist period people had moved from the rural areas to the cities, i.e. from the peripheral regions to the central part of the country. Young people and people of retirement or pre-retirement age were particularly ready to make the move. During the initial years of land reform after regaining the independence in the beginning of 1990s, the number of people in more distant Latvian districts increased.

Trends in the flow of domestic migration in later years showed that these were only temporary flows and motivations. Unfavourable socio-economic conditions, including a high level of unemployment and a lack of jobs, led to a different migration flow, with people once again moving away from the peripheral districts of the country (Krisjane et al, 2014).

New processes have emerged in the 2000s – urban sprawl around cities characterized by in-migration of affluent households in the suburbs. Since 1999, most recent flows are directed to the surrounding areas of large cities, especially Riga and show suburbanization processes. The migration pattern is strongly influenced by urban development. Riga is the largest and still growing centre of economic activities, thus continuing a long historical trend. Approximately 40 % of internal migration flows involve the city of Riga (Berzins, 2011).

The aim of the current study is to analyse mobility behaviour of rural residents with regard to population composition in the Latvian countryside. Our research examines population changes, composition and migration behaviour of

residents in remote countryside of Latvia. We use data from 2013 and 2014 surveys among 802 randomly selected households in eight small rural municipalities of the Vidzeme and Latgale region (Table 1). Total number of 497 respondents in Drusti, Dzerbene, Taurene and Zoseni parishes and 305 respondents in Latgale parishes – Lauderu, Pasienes, Rundenu and Zalesje. In order to compare population structure differences and mobility features in research areas descriptive statistic methods and non- parametric tests for more detailed analysis were used.

Characteristics of rural population and settlement

In the 1990s, studies showed that the denationalisation of property in the rural areas led considerable numbers of people to move back to their ancestral homes in rural areas. Both research territories suffer from population decrease and in period from 1989 to 2015 it has decreased for more than 30 per cent. This is especially evident in the case of Latgale (Table 1). According to official statistics, the population change was negative in all the selected municipalities.

Table 1

Population change in rural municipalities

| Municipalities | 1989 | 2000 | 2011 | 2015 | changes % 1989-2015 |
|----------------|------|------|------|------|---------------------|
| Lauderu | 664 | 540 | 401 | 348 | -47.6 |
| Pasienes | 990 | 832 | 635 | 563 | -43.1 |
| Rundenu | 971 | 800 | 504 | 466 | -52.0 |
| Zalesjes | 1073 | 945 | 659 | 614 | -42.8 |
| Drusti | 1247 | 1205 | 941 | 850 | -31.8 |
| Dzerbenes | 1161 | 1100 | 868 | 801 | -31.0 |
| Taurenes | 1102 | 1096 | 836 | 804 | -27.0 |
| Zosenu | 658 | 597 | 433 | 384 | -41.6 |

Source: author's calculations based on the database of Central Statistical Bureau

The researched rural parts and specific parishes in Latvia both village centres and farmsteads suffer greatly from population decrease forming territories with low density of ageing population. Amenities, availability of road infrastructure, location, accessibility along with family connections, employment possibilities, environmental quality, landscape attraction and

property location and status comprise the complexity of residential choice.

Personal characteristics (age, gender, employment status, education, and rootedness and migration behaviour) and contextual factors (unemployment level and settlement type) are both important in shaping the composition of rural population.

Comparison of the researched territories shows both similarities revealing general trends but at the same time location specific features are found. For example, as displayed in Table 2 gender distribution both in Vidzeme and Latgale show overrepresentation of female respondents. There are more female respondents in all cases, especially evident the difference is in the case of Zalesje and Taurene parishes. This imbalance is often caused by the household size and main characterizing features. In the case of Vidzeme, 20 % of respondents live alone from those 67 % female and 33 % male and 50 % of households have two persons permanently living there. In the case of Latgale, 1-person household is common in 34 % from those 66 % female and 34 % male of cases and two person households similar in 36 % of cases. In the sample, the dominant age group with 33 % are persons over 65 years of age and second with 29 % age group from 41 – 44. Only 4 % of respondents taking part in the research were under 24 years of age (Table 2).

In terms of education, respondents mirror general trends in the country where 34 % have vocational education, 27 % secondary, 22 % primary educations and around 17 % hold university level education. Regional distribution reveals similar trends for primary and secondary education (Vidzeme 53 % and 51 %, Latgale 47 % and 49 %); however, for vocational education in Vidzeme 76 % respondents hold this level of education, while in Latgale only 24 % and only 33 % of respondents in Latgale hold university level education, while 67 % in Vidzeme.

General occupational characteristics provide explanation to age distribution and low economic activity. From all respondents in both regions 38 % are employed, 36 % are not working retired seniors, unemployed persons and persons who receive social benefits comprise 19 %, retired persons who also are employed have 4 %, only 3 % study. More detailed description of occupational variables for two most common situations in Vidzeme and Latgale show that 78 % from respondents in Vidzeme are working age, whilst in Latgale region only 22 % of respondents are employed. For more elderly respondents distribution is more equal, respectively 53 % in Vidzeme and 47 % in Latgale are retired.

Location specific mobility and immobility in Vidzeme and Latgale

Demographic characteristics and profile of population residing in rural parts of Latvia display varying migration behaviour looking both at level of migration activity and actual place of residency in the rural parts of the country. The results show that there are location specific differences among respondents living in farmsteads and village centres. Sparsely populated rural areas are less attractive than rural centres to those with higher incomes and high education.

Vidzeme is the central part of the country. The results show that around 30 % of respondents are aged over 65 years of age and reside in the current place over 20 years. Stability of the rural settlement is characterised by 40 % of respondents who have lived there since birth, the same amount lives there 20 years or longer and 20 % have moved to rural parishes before 20 years or less.

Region of Latgale is situated in the eastern part of the country and some of the research territories are at the border with Russia. Dramatically around 40 % of respondents in this territory were aged over 65 years of age, 31 % aged 41 – 55 years, 19 % 56 – 64 and only 10 % of respondents up to 40 years of age. 57 % of

respondents have lived in the regions since birth, 28 % over 20 years and the rest have moved to Latgale region in period between 10 – 20 years. In contrast to the Vidzeme case, around 90 %

reside in Latgale region permanently. Seasonal residence and second home ownership is very seldom.

Table 2

Respondent characteristics (%)

| Region of Latvia | Research area (parish) | Gender, % | | Age group, % | | | | Economic activity, % | | | |
|-------------------------|------------------------|-----------|--------|--------------|-------|-------|-------|----------------------|----------|----------|---------|
| | | Male | Female | up to 24 | 25-40 | 41-55 | 56-64 | over 65 | Employed | Inactive | Retired |
| Vidzeme N=497 | Drusti | 39 | 61 | 2 | 33 | 28 | 10 | 26 | 68.4 | 15.4 | 16.2 |
| | Dzerbenes | 37 | 62 | 4 | 10 | 27 | 22 | 38 | 49.2 | 16.9 | 33.8 |
| | Taurenas | 24 | 76 | 6 | 14 | 36 | 17 | 27 | 55.6 | 17.0 | 27.5 |
| | Zosenu | 49 | 51 | 7 | 12 | 32 | 16 | 33 | 46.8 | 19.0 | 34.2 |
| Latgale N=305 | Lauderu | 31 | 69 | 0 | 7 | 36 | 18 | 38 | 32.7 | 21.8 | 45.5 |
| | Pasienes | 33 | 67 | 3 | 8 | 37 | 18 | 33 | 18.1 | 37.5 | 44.4 |
| | Rundenu | 41 | 59 | 1 | 6 | 28 | 13 | 50 | 17.6 | 35.0 | 57.4 |
| | Zalesje | 28 | 72 | 4 | 11 | 25 | 23 | 37 | 20.7 | 31.9 | 48.8 |

Source: author's calculations based on survey results

Despite the fact that living in countryside becomes more popular and attracts seasonal residents and second home owners to the rural parts of Latvia, still peripheral and marginal rural territories are less attractive for in-migrants from peri-urban territories elsewhere in Latvia. If to analyse the main reasons for moves to the particular rural places in Vidzeme, mostly it has been family related and purchase of the property accompanied with pleasant landscape and living environment. Among respondents, 15 % have previous international migration experience and 1/3 has family members, friends and neighbours who live outside Latvia.

The main reasons for moving to Latgale are predominantly family based reasons, employment, property purchase and more affordable living environment. The main factors of attractiveness for residential choice are location, attractive landscape and rural tranquillity in Vidzeme.

Characteristics of rural settlement

Patterns of traditional rural settlements in Vidzeme are displayed dividing around 70 % of

respondents living in farmsteads and other residing in blockhouses or private housing in village centres. However, in Latgale almost around 56 % of respondents reside in farmsteads, but 44 % in housing based in village centres.

The method for detecting location specific settlement differences non parametric Kruskal-Wallis test was used. Statistical significance level below 0.05 indicates that the differences are statistically significant with 95 % probability (highlighted in bold in Table 3).

Further statistical analysis of the dataset allowed discovering more detailed rural population profile taking into account their place of living in the rural territories both in Vidzeme and Latgale region (Table 3). There are statistically significant gender differences between farmstead and village inhabitants. Since in the case of Latgale age group distribution was not so well represented only in the case of Vidzeme there are location specific significant differences. Following analysis of the employment status taking into account three groups –

employed, inactive and retired in all cases show significant differences between village centres and single farmsteads. On the same line

education differences are observed only in the case of Latgale as here representation of university level respondents was poor.

Table 3

Profiles of location specific farmstead and rural villages' respondents, (%)

| | | VIDZEME farmsteads | VIDZEME villages | P value / Asymp. Sig. (two-tailed) | LATGALE farmsteads | LATGALE villages | P value / Asymp. Sig. (two-tailed) |
|---|---------------------|---------------------------|-------------------------|---|---------------------------|-------------------------|---|
| Gender | Males | 39.7 | 25.0 | 0.003 | 41.4 | 21.4 | 0.000 |
| | Females | 60.3 | 75.0 | | 58.6 | 78.6 | |
| Age group | 15-24 | 6.2 | 3.7 | 0.000 | 2.6 | 1.6 | 0.331 |
| | 25-40 | 13.3 | 24.8 | | 9.2 | 8.0 | |
| | 41-55 | 29.0 | 33.3 | | 27.0 | 36.0 | |
| | 55-64 | 17.2 | 13.3 | | 22.4 | 14.4 | |
| | 65< | 33.8 | 17.9 | | 38.8 | 40.0 | |
| Migration experience | In-migrants | 16.9 | 20.7 | 0.509 | 19.1 | 10.7 | 0.031 |
| | Long-term residents | 83.1 | 79.3 | | 80.9 | 89.3 | |
| Economic activity | Employed | 42.8 | 63.4 | 0.000 | 15.8 | 28.8 | 0.004 |
| | Inactive | 23.8 | 18.7 | | 36.2 | 20.8 | |
| | Retired | 33.4 | 17.9 | | 48.00 | 50.4 | |
| Education | Primary | 17.0 | 16.1 | 0.659 | 32.2 | 25.8 | 0.000 |
| | Secondary | 22.1 | 21.0 | | 39.5 | 29.0 | |
| | Vocational | 43.3 | 42.0 | | 22.4 | 20.2 | |
| | Higher | 17.6 | 21.0 | | 5.9 | 25.0 | |
| Land ownership | Yes | 79.0 | 38.9 | 0.000 | 69.1 | 49.6 | 0.001 |
| | No | 21.0 | 61.1 | | 30.9 | 50.4 | |
| Intentions to change the place of residence | Yes | 2.4 | 8.4 | 0.016 | 0.7 | 2.4 | 0.479 |
| | No | 91.0 | 83.9 | | 96.7 | 95.2 | |
| | Do not know | 6.6 | 7.3 | | 2.6 | 2.4 | |
| | | N=335 | N=163 | | N=174 | N=133 | |

There were significant differences found between farmstead and village population checking for land ownership. But intentions to change current place of living proved to be with the significant result in the case of Vidzeme parishes. In this case, rural population in Latgale region can be characterised as highly immobile with less location specific but more relates to population ageing issue.

The comparison of Vidzeme and Latgale regions show significant differences between farmstead and rural centres respondents in terms of gender, employment and land ownership in these types of habitation. By contrast, in Vidzeme there are significant differences between age groups, since in farmsteads greater proportion of

population aged over 65 years reside than in rural centres, while in Latgale both in rural centres and farmsteads are represented with large proportion of elderly people. Level of education is statistically significant in the case of Latgale rural centres where relatively more people with higher education than on farms are living. Vidzeme does not display significantly different migration experience between farmsteads and rural centres. By contrast, there are significant differences in Latgale, because those living on farms have indicated that they are more likely to go abroad, while the migration intentions in this region do not differ. Rural centres in Vidzeme differ significantly in terms of

migration intensions; they have almost three times higher intention to go abroad.

Conclusions, proposals, recommendations

- 1) Personal characteristics (age, gender, employment status, education, and rootedness and migration behaviour) are important in shaping the composition of long-time residents and in-migrants.
- 2) Migration selectivity is relatively stable in comparing with other studies. Although the differences in migration behaviour by demographic characteristics are in line with universalistic explanations, the patterns are different for remote rural areas (farmsteads) and rural centres (villages). When the two types of countryside are compared to each other, the sparsely populated rural areas are less attractive than rural centres to those with higher incomes and high education.
- 3) Household sizes decrease while older age cohorts increase their shares of the total population.
- 4) More remote rural areas compared to suburban territories are less attractive for migration processes. Rural areas are

continuously experiencing tendency of depopulation.

- 5) Ageing and changes in population dynamics reflects in population distribution, there is increase in households of one to two persons mostly retired or close to retirement age persons.
- 6) Farmsteads are becoming more attractive as second homes and in the case of Vidzeme second home owners represent the growing group of seasonal residents.
- 7) In general, results point to relatively low migration potential especially in Latgale region as aged population is low in its mobility actions.

Acknowledgments

The research was funded by the National Research Program "EKOSOC-LV" [grant number 5.2.4], the Latvian Council of Sciences [grant number 514/2012], and University of Latvia, to whom we are very grateful.

Bibliography

Journal paper with author(s)

1. Berzins, M. (2011). Iedzīvotāju geografiskas mobilitātes loma suburbanizācijas norisēs Latvijā. Promocijas darbs. Latvijas Universitāte.
2. Central Statistical Bureau of Latvia (2002). Latvijas 2000.gada tautas skaitšanas rezultāti. Rīga
3. Central Statistical Bureau of Latvia (2015a). Pastāvīgie iedzīvotāji pa teritoriālajam vienībām pēc dzimuma 2011.gada 1.martā <http://data.csb.gov.lv/> Access: 15.12.2015
4. Central Statistical Bureau of Latvia (2015b). Pastāvīgo iedzīvotāju skaits pēc dzimuma republikas pilsetās, novados, novadu pilsetās un pagastos gada sakuma un vidēji gada. Elektroniska datu bāze. <http://data.csb.gov.lv/> Access: 20.02.2016.
5. Central Statistical Bureau of Latvia (2017). Resident Population at the Beginning of the Year. Electronic data base <http://data.csb.gov.lv/> Access: 01.02.2017.
6. Cloke, P. and Thrift, N. (1990). Class Change and Conflict in Rural Areas. In: Marsden, T., Lowe, P., Whatmore, S. (Eds.), *Rural Restructuring*, pp. 165-181. David Fulton, London.
7. Fischer, P. A., Holm, E.; Malmberg, G.; Straubhaar, Th. (2000). Why Do People Stay? Insider advantages and immobility, HWWA Discussion Paper, No. 112.
8. Hann, C. with the "Property Relations" Group, (2003). The Postsocialist Agrarian Question: Property Relations and the Rural Condition, Litverlag, Münster.
9. Krisjāne, Z., Apsīte – Berina, E., Grīne, I., Berzins, M., Joca, G. (2016). Migrācijas procesi attālos Latvijas reģionos: Latgales un Sēlijas piemērs. *Folia Geographica* XV, pp. 107 – 110.
10. Krisjāne, Z., Feldmane, L., Apsīte – Berina, E., Grīne, I., Berzins, M. (2014). The Role of Migration in the Rural Peripheralization in Post-Soviet Latvia. Extended abstract. European Population Conference (EPC 2014) <http://epc2014.princeton.edu/papers/141027>. Access: 01.02. 2017.
11. Leibert, T. (2016). She Leaves, He Stays? Sex-selective Migration in Rural East Germany. *Journal of Rural Studies*, Volume 43, pp. 267-279

12. Milbourne, P., Kitchen, L. (2014). Rural Mobilities: Connecting Movement and Fixity in Rural Places. *Journal of Rural Studies*, Volume 34, pp. 326-336.
13. Moravec, J., Zemeckis, R., (2007). Cross Compliance and Land Abandonment. Deliverable D17 of the CC Network project SSPE-CT-2005-022727
14. Owczarzak, J., (2009). Introduction: Postcolonial Studies and Postsocialism in Eastern Europe. *Focaal* 53, 3–19.
15. Pallot, J., Nefedova, T., (2007). Russia's Unknown Agriculture. In: Household Production in Post-Socialist Rural Russia. Oxford University Press, Oxford.
16. Puzulis, A., Kule, L. (2016). Shrinking of Rural Territories in Latvia. *European Integration Studies*, (10), 90-105.
17. Ruskule, A., Nikodemus, O., Kasparinskis, R., Bell, S., Urtane, I. (2013). The Perception of Abandoned Farmland by Local People and Experts: Landscape Value and Perspectives on Future Land Use. *Landscape and Urban Planning* Volume 115, pp.49–61.
18. Stockdale, A. (2014). Unravelling the Migration Decision-making Process: English early retirees moving to rural mid-Wales. *Journal of Rural Studies*, Volume 34, pp 161-171.
19. Terres, J.-M., Scacchiafich, I.N, Wania, A., Ambar, M., Anguiano, E, Buckwell, A., Coppola, A., Gocht, A., Nordström Källström, H, Pointereau, P., Strijker, D., Visek, L., Vranken L., Zobena, A. (2015). Farmland Abandonment in Europe: Identification of Drivers and Indicators, and Development of a Composite Indicator of Risk. *Land Use Policy*, Volume 49, pp. 20–34.
20. Wiest, K. (2016). Migration and Everyday Discourses: Peripheralisation in Rural Saxony Anhalt from a Gender Perspective. *Journal of Rural Studies*, Volume 43, pp. 280-290.

FIREFIGHTING AND RESCUE SOLUTIONS FOR RURAL AREAS OF THE REPUBLIC OF LATVIA

Jelena Malahova¹, Dr.oec.,assist. prof.; **Janis Ievinsh**², Dr.oec., prof. and
Karlis Ketners³, Dr.oec., prof.

^{1,2} Riga Technical University, ³ BA School of Business and Finance

Abstract. The issue of the firefighting organization in rural areas is particularly important and topical today. More populated places in Latvia currently have no firefighting structural units therein located because the number of existing firefighting stations is insufficient. According to statistical data, no country in the world can afford to organize the presence of a professional fire and rescue service in every populated place. A solution to the problem can be the development of volunteer firefighter associations and volunteer firefighter brigades. The study is aimed to evaluate the creation of voluntary fire safety, firefighting and rescue service models at the municipal level in the Republic of Latvia, to find and propose efficient solutions for the creation of voluntary fire safety, firefighting and rescue service models.

Key words: firefighting, rural region, volunteers, municipality.

JEL code: R53

Introduction

In recent years, a steady downward trend remains in the number of fires and the number of people who have lost their lives and/or suffered in fires. Of course, this is due to the increased proficiency and improved work organization of fire departments in Latvia. An important role is played by improvement of normative base in the field of fire safety. However, serious problems exist. Particularly important and topical issue is the firefighting organization in rural areas. At present time, there are more populated places in Latvia where no fire department is located since the number of fire stations is insufficient. According to statistical data, no country in the world can afford to organize a professional fire and rescue service in every populated place. As a solution to the problem can be the development of volunteer fire associations and volunteer fire brigades. All over the world there are volunteer fire formations and each country has its own nuances. For example, in Ireland only the capital city of Dublin has a professional firefighting organization while all other populated places have mixed fire brigades consisting of both professional fire teams and voluntary fire teams. In Belgium, almost all firefighters are volunteers. Firefighters are granted serious privileges, therefore when completing the fire-fighting units the preference is given to technical professionals, athletes, people who taking into account the

specificity of work have a lot of free time. It is notably that 7 % of the volunteer firefighters in Belgium are women. Volunteer fire associations are widely developed across Europe: UK, Austria, Denmark, Italy, Finland, France, Germany, as well as in the United States. The feature of European volunteer fire associations is that they are incorporated in social formations - unions, associations - along with professional firefighters and scientific and technical organizations engaged in the development of firefighting equipment and firefighting outfit.

In Latvia, procedure under which the State Fire and Rescue Service carries out and manages firefighting and rescue works is determined by the Cabinet of Ministers.

Nowadays, not only regulatory enactments can bring specific and practical approaches for tackling the problems in a particular field. A regulatory enactment is usually a summary of regulations, which shows the direction but the problem-solving way usually is not straight.

The study is aimed to evaluate the creation of voluntary fire safety, firefighting and rescue service models at the municipal level in the Republic of Latvia, to find and propose efficient solutions for the creation of voluntary fire safety, firefighting and rescue service models.

1. Fire safety and firefighting in Latvia

The Fire Safety and Firefighting Law specifies the system of fire safety, firefighting and rescue

¹ Jelena Malahova. Tel.: + 371 67089099, E-mail address: jelena.rtu@inbox.lv.

services and organizations, the tasks and competence of natural and legal persons and expertise in the field of fire safety and firefighting, as well as the functions of the State Fire and Rescue Service (hereinafter referred to as SFRS) functions and the duties, rights and legal protection of SFRS officials with special service ranks (The Cabinet of Ministers, Fire Safety and Fire-fighting Law).

To evaluate the fire and firefighting systems, it is necessary to know what fire safety, firefighting and rescue services and organizations exist in Latvia, what their duties, tasks and rights are.

According to the Fire Safety and Firefighting Law, Article 4, paragraph (1), Latvia has the following fire safety, firefighting and rescue services and organizations:

- 1) State Fire and Rescue Service;
- 2) fire safety, firefighting and rescue services of institutions, organizations and commercial companies;
- 3) local governments' fire safety, firefighting and rescue services; and
- 4) voluntary firefighter organizations.

2. Core of the problem

Today's world is rapidly developing in more fields, such as production, culture and entertainment in big cities, extensive construction works in residential sector, lightning-fast changes in infrastructure, big part of people from rural areas goes to cities for a better education and a job. A big number of people and vehicles leads to traffic jams on streets and roads, which makes difficult getting to the scene on time. In yards of multi-storey residential buildings courtyards the operative transport vehicles face movement problems because with each passing day more and more cars are chaotically parked in the yards blocking the roads. Rural areas have other problems, such as distance from SFRS station to a possible incident scene and access roads.

The main problem is, first, to reach the incident scene as soon as possible in order to save human or animal life, provide first aid, reduce material damages, harm to environment and so on and second, to meet the requirements of Fire Safety Regulations. Fire safety risk analysis is one of the necessary approaches helping to ensure the necessary and sufficient level of safety (Hasofer, A., Beck, V. R., & Bennetts, I. D. (2006)). As mentioned by Degel, D., Wiesche, L., Rachuba, S., & Werners, B. (2014) volunteer fire departments have been founded to ensure public safety in case of fire and to provide support for professional firefighters. Most of the current stations date back to the beginning of the 19th century. Today, volunteer fire departments face numerous challenges, such as reduced number of following young volunteers or decreasing public budgets. In most countries, the network of fire stations has historically grown one station at a time as new needs and means for prevention and protection emerged. The fundamental question underlying this research problem is: given a time norm (e.g. 8 min) within which 90 % of fires must be reached, what is the lowest-cost solution that can achieve this? The main decision variables are the location and staffing of fire stations, and the proposed approach is intended to guide retrospective assessment as well as prospective planning.

SFRS ensures arrival of its units at the incident scene (The Cabinet of Ministers, No 279; The Cabinet of Ministers, No.398):

- 1) in towns of national status – within five minutes after call is received;
- 2) in other towns and rural territories with population density 10 and more people per square kilometre – within 15 minutes after call is received;
- 3) in rural territories with population density less than 10 people per square kilometre – within 15 minutes after call is received.

Fire and Rescue Service of the Republic of Latvia has 43 brigades and 49 stations, of which (State Fire and Rescue Service of Latvia):

- in Riga - 15 brigades and 6 stations;
- in Latgale - 9 brigades and 10 stations;
- in Kurzeme - 6 brigades and 10 stations;
- in Zemgale - 6 brigades and 11 stations;
- in Vidzeme - 7 brigades and 12 stations.

In total, 92 firefighting departments are established in the Republic of Latvia (State Fire and Rescue Service of Latvia).

Municipal firefighting formations as well as voluntary firefighter organizations are established in the Republic of Latvia. But most of them have a primary purpose not only to provide assistance and support for the State Fire and Rescue Service. Assessing the situation in the country and summarizing the data about registered formations, the following information was obtained.

1) Number of volunteer firefighter organizations in the country – 42. Activities and number:

- firefighting - 9 organizations;
- provision of fire safety services - 23 organizations;
- provision of other services - 10 organizations.

2) Number of municipal firefighting formations in the country - 35. In 2014, volunteer firefighter organizations and municipal firefighting formations participated in firefighting works - 322 times (State Fire and Rescue Service of Latvia).

Assessing the existing situation with the volunteer firefighter organizations and municipal firefighting formations in the Republic of Latvia, it was concluded that the municipal firefighting formations as far as possible provide assistance to the State Fire and Rescue Service in firefighting works and partial assistance is provided by volunteer firefighter organizations. However, as mentioned in C. Y. Li (2013), the inter-regional mobilization is the scene of the fire power of the commanders of major hazard of fire according to first make the decision that the

activities of fire rescue and command necessary step, whether the power to mobilize quickly, accurately and reasonably, is directly related to fire fighting and rescue operations success or failure.

3. Necessity to create models of volunteer municipal fire safety, firefighting and rescue services in Rezekne and Vilanu Regions

Modern rural settlements differ a little from towns in terms of appearance, improvements and fire protection. However, the existing old settlements often do not comply with fire safety requirements. Wide use of combustible materials, densely built-up areas of residential houses and household outbuildings, unavailability of firefighting water intakes, small number of fire departments, disorganized road infrastructure as well as in some cases insufficient communication contribute to rapid spread of fire. Flying sparks give birth to new bodies of fire. Due to wind, sparks can fly at a long distance and as a result a fire spreads over a large area. Rural territories are divided into residential and production areas. The residential area includes residential compounds and public centres. The production area is composed of buildings and structures, which are combined with technological processes, energetic and sanitary facilities and transportation systems. Distances between residential and household outbuildings do not comply with existing standards; built-up area is dense, as well as combustible materials are used in the construction. Such populated places mostly have no firefighting water supply and rivers, lakes, ponds, wells and artesian wells are used as water intakes.

Water delivery for fire extinguishing is often hampered due to heavy access roads, lack of roads at water intakes or low water levels in wells as well as difficult use of well in winter. Roads in rural areas do not always have a solid coating, which hampers transport traffic.

Fires in rural areas can be divided into three groups: fire in residential area; fire in production area; and fire in a standalone facility. Dense built-up area of residential houses, existence of wooden household outbuildings and combustible roofing contribute to the spread of fire over residential houses and onto adjacent buildings.

Calculation of potential fire brigade arrival time from the nearest depot in a rural region:

$$T_{\text{trip}} = L \times V \quad (1);$$

$$T_{\text{trip}} = 60 \times 30/55 \sim 32 \text{ min,}$$

where L – distance to incident scene (Ivannikov & Klus, 2007);

V – average speed of tank truck.

It can be concluded that the required arrival time is 32 minutes, but it does not mean that the first SFRS unit will be able to arrive at the incident scene after 32 minutes. Time significantly depends on the time the fire breaks out and is detected, notified, SFRS departure from the depot, the distance from SFRS depot distance to the incident scene and the time of SFRS deployment at the incident scene. In one word, it is the fire free development time.

The precious first ten minutes (initial phase of fire) will be lost by the time the firefighters arrive. These minutes are the most important, because the flame then spreads twice slower than during the basic phase of fire.

Accordingly, the calculation of the burnt areas is made for the 39th minute, because it is assumed that 6 minutes will be required for the deployment of equipment.

Determine the fire spread if $t_3 = 39$ min.

Calculation by formula:

$$Pu^{39 \text{ min}} = 5U_1 + U_1 \times t \quad (2)$$

where U_1 – fire spread linear speed equal to 1.0 m/min (Ivannikov & Klus, 2007);

$$t = t_3 - 10 \text{ min} = 39 - 10 = 29 \text{ (min)}$$

$$Pu_{39 \text{ min}} = 5 \times 1 + 1 \times 29 = 34 \text{ (m)}$$

Calculate fire area on $t_3 = 39$ min by formula:

$$Su^{39 \text{ min}} = (34 + 4) \times 20 = 760 \text{ (m}^2\text{)}$$

It can be concluded that 760 m² area has burnt out, which is equivalent to a considerable

household outbuilding and will cause essential economic damages as well as endanger other neighbouring facilities.

4. Possible maintenance costs of models of volunteer municipal fire safety, firefighting and rescue services

Each person has parish premises, garages, former household outbuildings or workshops, which can accommodate at least one fire tank truck and personnel. Maintenance of the State Fire and Rescue Service stations requires more than EUR 100,000. But if conditionally calculate the maintenance costs of municipal volunteer firefighter association, it can be concluded that their necessary maintenance costs are lower:

- Fuel - EUR 1,000/year (trips to incidents, maintenance and training);
- Tank truck maintenance - EUR 1,000/year (repairs and maintenance);
- Electric power costs (200 kWh/month) - EUR 400/year;
- Water and sewerage costs - EUR 100/year;
- Other public utility services, waste removal - EUR 100/year;
- Heating fuel - EUR 500/year;
- Equipment - 300 EUR/year;
- Compensation of municipal volunteer firefighter (truck driver) (best option – 2 people per civil parish, of which one permanently on duty) – EUR 600/month before taxes – 7,200/year (salary charged in accordance with hours worked);
- Compensation of municipal volunteer firefighter (best option – 3 people per civil parish, of which one permanently on duty) – EUR 500/month before taxes – 6,000/year (salary charged in accordance with hours worked).

The maximum costs would be not more than EUR 20,000. One of the best options is to place municipal volunteer firefighter units in the territory of parish administration buildings or next to it. Then the maintenance costs would be lower since remote standalone premises and

garages require a separate funding, but if they are located directly in the territory of parish administration buildings, they are maintained for the account of funding allocated to the parish administration buildings. The same can be applied to the municipal volunteer firefighters and local volunteer firefighters - drivers. If their deployment place will be maximally close to the parish administration building, then during the day they can perform other duties (if there is no call for an incident) or perform basic functions in the parish administration for other salary. Accordingly, leaving for an incident they shall receive a contractually agreed remuneration for the work.

5 Models of volunteer municipal fire safety, firefighting and rescue services: training and social guarantees

The first main objective is to develop and approve an external regulatory enactment on municipal voluntary fire safety, fire and rescue services or associations. It desirably would be the law "On municipal voluntary fire safety, fire and rescue services or associations" that would regulate the activity status, tasks, functions as well as definitions of municipal voluntary fire safety, fire and rescue services or associations. According to it, the firefighters association would be established in such populated places to reach which a professional firefighting service would spend too much time and be unable to meet legislative requirements. It is also possible to establish municipal volunteer firefighter associations in other populated areas and facilities in order to provide assistance for the professional fire service. Logistical support of municipal volunteer firefighter association shall be carried out for account of their funds as well as from national and municipal support and other sources meeting national legislation.

Another serious and important issue is associated acquisitions, compensations and benefits for municipal volunteer firefighters, of which we can propose the following examples.

- 1) Establish social and legal guarantees for municipal volunteer firefighters and their families.
- 2) Exemption from work or studies without salary retention (for working inhabitants) but retaining their job, place of study, place or position for the time of firefighting or rescue work in the volunteer firefighter association or brigade, or for the time of professional training.
- 3) Compensation for absence at basic workplace or studies for the time when a firefighter carries out firefighting or acquires vocational training.
- 4) Compensations are provided in the employment contract for fire prevention or firefighting and rescue operations.
- 5) Compensations for performance of a municipal volunteer firefighter duties during time free from work or studies.
- 6) Coverage of costs associated with travel from the place of residence, workplace or place of studies to the place of vocational training and back.
- 7) Repayment of costs of work trip associated with professional training.
- 8) Assigning the right to join without a competition a firefighting technical educational establishment, on condition of successfully passed entrance examinations.
- 9) Firefighters of municipal volunteer firefighter association of territorial departments at their workplace shall be granted annual leave without pay for a period up to ten calendar days.
- 10) Besides, local governments shall offer discounts on payment of housing, property tax etc.

Conclusions, proposals, recommendations

Having summarized the available information, the authors concluded the following.

- 1) In 2014, volunteer firefighter organizations and municipal firefighting formations participated 322 times in firefighting works.;
- 2) Most part of volunteer firefighter organizations is only engaged in profit gain, their main purpose is the provision of paid services in the field of fire safety.
- 3) Taking into consideration the possibilities of national budget, SFRS cannot afford to establish firefighting depot in every populated place as well as with firefighting and rescue works in rural areas (uncovered rural areas).
- To solve the problems, the authors put forward the following proposals:
- 1) to develop law on municipal fire safety, firefighting, civil protection and rescue service;
 - 2) to create in municipalities (uncovered rural areas) the models of municipal volunteer fire safety, firefighting and rescue services, also with involvement of volunteer firefighters;
 - 3) to provide municipal volunteer firefighters with social guarantees and popularize their work in society.

Bibliography

1. Ambler, T. (1999). *Marketing Od A do Z (Marketing from A to Z)*. Wydawnictwo Profesjonalnej Szkoły Biznesu, Krakow, pp. 337-338.
2. *Business Tendency Surveys. A Handbook* (2003). Paris: OECD, p. 127.
3. Orlova, U. L. (2013). *Socialiai globojamu vyresnio amziaus asmenu gyvenimo kokybes veiksniai (The Quality of Life Factors of Assisted Elderly People)*. Gerontologija 2013; 14(2), pp. 96-105.
4. Phelps, E. S. (1972). *Inflation Policy and Unemployment Theory*. New York: Norton. p. 322.
5. Pukenas, K. (2009). *Kokybinii duomeniu analize SPSS programa: mokomoji knyga (Qualitative data analysis using SPSS programme: teaching book)*. Lietuvos kuno kulturos akademija. Kaunas: LKKA. p. 93.
6. Racine, J.B. Reymond, H. (1977). *Analiza Ilosciowa w Geografii. (Quantitative Analysis in Geography)*. PWN, Warszawa, pp. 254.
7. Karanassou, M., Sala, H., Salvador, P.F. (2007). *Capital Accumulation and Unemployment: New Insights on the Nordic Experience*. IZA Discussion Paper, 3066. Retrieved: <http://ssrn.com/abstract=1025889>. Access: 16.09.2012
8. *Kohaliku omavalitsuse üksuste voimekuse indeks 2013 (Local Governments Capacity Index 2013)*. (2014). Geomedia. 57 p. Retrieved: http://www.fin.ee/public/KOV/Uuringud_ja_analuusid/2014_kov_voimekuse_indeks_loppversioon.pdf. Access: 15.11.2015.
9. *Maszynowa Wspolnota w Unii Europejskiej (Machinery Community in the European Union)*. (2002). Retrieved: <http://www.ppr.pl/artukul-maszynowa-wspolnota-w-unii-europejskiej-20152-dzial-9.php> Access: 10.12.2015
10. Li, C. Y. (2013) *The Design of Inter-Regional Fire and Rescue Mobilization System*. Advanced Materials Research, Vol. 601, pp. 383-389.
11. Degel, D., Wiesche, L., Rachuba, S., & Werners, B. (2014). *Reorganizing an Existing Volunteer Fire Station Network in Germany*. Socio-Economic Planning Sciences, 48(2), pp. 149-157.
12. Cabinet of Ministers, Road Traffic Regulations. (2015). Retrieved: <http://likumi.lv/ta/id/274865-celu-satiksmes-noteikumi>. Access: 20.10. 2016.
13. Cabinet of Ministers, By-law of the State Fire-fighting and Rescue Service. (2010). Retrieved: <http://likumi.lv/doc.php?id=209089>. Access: 20.10. 2016.
14. Cabinet of Ministers, Fire Safety and Fire-fighting Law. (Last amendments 2013). Retrieved: <http://www.likumi.lv/>. Access: 20.10. 2016.
15. Chevalier, P., Thomas, I., Geraets, D., Goetghebeur, E., Janssens, O., Peeters, D., Plastria, F. (2012). *Locating fire stations: An integrated approach for Belgium*. Socio-Economic Planning Sciences, Volume 46, Issue 2, June 2012, pp. 173-182, ISSN 0038-0121, <http://dx.doi.org/10.1016/j.seps.2012.02.003>. (<http://www.sciencedirect.com/science/article/pii/S003801212000080>).
16. State Fire and Rescue Service of Latvia, Retrieved: <http://www.vugd.gov.lv/>, Access: 10.11.2016.
17. Ivannikov, V.P., Klus, P.P. (2007) *Spravochnik rukovoditela tusenia pozara*. Moskva: Strojizdat, 288 s.

USE OF PREVENTIVE MEASURES FOR REDUCTION IN THE NUMBER OF FIRES: POSSIBLE SOLUTIONS

Jelena Malahova¹, Dr.oec., assist.prof.; Vladimirs Jemeljanovs², Dr.sc.ing., prof. and Karlis Ketners³, Dr.oec., prof.

^{1, 2} Riga Technical University; ³ BA School of Business and Finance

Abstract. Possible fire risks are urgent taking into account the potential damages that could be caused by fires. One of the aspects of human safety is the prevention of risks and maintenance of adequate fire safety level at workplaces, public areas and in own dwelling. The study is aimed to develop proposals for reduction in the number of fires and victims, improve the preventive measures collectively implemented by the State Fire and Rescue Service and private persons. The study used the theoretical research methods: deconstruction, descriptive, analysis of aspects as well as the empirical research methods (survey) and data processing methods.

Key words: fire prevention.

JEL code: R19, L89

Introduction

Conduct of individuals is supervised and controlled by the State through issue of external regulatory enactments (laws and Cabinet regulations) specifying the rights of individuals and their obligations towards the State in various fields - also with regard to fire safety. Individuals have an obligation to follow the effective regulatory enactments. Fire Safety and Firefighting Law, Article 10, paragraph one, establishes that the owner (possessor), manager, lessee or, in accordance with the agreement, other user of the building, structure, parts thereof or land parcel, who is responsible for fire safety at the object, has a duty to ensure compliance with fire safety requirements laid down in the laws and regulations (The Cabinet of Ministers, Fire Safety and Fire-fighting Law, 2013).

The author could agree with Korbes et al (2010) and Hoyos & Zimolong (2014) that one of crucial aspects of a human fire safety in the face of fire is the possibility of safe escape. An important precondition is that its fire safety facilities enable independent and adequate fire response performances by the building's occupants. In practice, it appears that the measures currently required by law do not always provide the support that people in burning buildings need. Consequently, understanding how individuals behave in the case of fire and fire evacuation is essential if we

are to bring fire safety measures into line with occupants' needs during an incident (Kobes et al, 2010).

Besides, unintentional injury is a leading cause of mortality and disability among young and old. While evidence about the effectiveness of interventions in reducing injuries is accumulating, reviews of this evidence frequently fail to include details of implementation processes (Brussoni, et al, 2006). There is evidence that some interventions are effective in reducing the risk of fire-related injuries and in promoting fire prevention practices. Smoke alarms reduce risk of death in house fires (Marshall et al, 1998; Runyan et al, 1992; Rohde et al, 2016). Education, with or without safety equipment being provided, is effective in increasing the prevalence of functioning smoke alarms (Kendrick et al, 2012; DiGuseppi et al, 2001) and home safety education increases the prevalence of fire escape planning. A recent systematic review identified the main barriers and facilitators to implementing injury prevention interventions; these included the type of approach used (one-one; group work; partnership working; tailored methods), characteristics of the deliverer, the complexity of the intervention, accessibility to safety equipment and the importance of achieving behavioural change (Ingram et al, 2011). It is therefore important that interventions to

promote injury prevention take these barriers and facilitators into account.

Preventive fire safety interventions are aimed to limit the violations of Fire Safety Regulations, which provides for persons possibility to knowingly and willingly avoid of undesirable fire-related events. Preventive interventions are aimed at promoting personal awareness of requirements laid down in fire safety regulations and are focused on fulfilment of established requirements.

However, fire protection standards established in the country are met or ignored by natural persons, i.e. people (employees at their workplaces, businessmen organizing their business and arranging workplaces for their employees, people equipping their dwelling). In order to promote fire safety requirements, certain knowledge and skills are required. Fire safety regulations state that any natural person has the obligation to prevent a fire, know how to act in case of fire, to whom to report about fire. Everyone should be able to quickly and objectively assess the situation, own abilities, whether to act independently or call rescuers as soon as possible. In such cases, it is important that people do not lose the ability to quickly make the right decision how save themselves, their close people, neighbours and their property. To help avoid fire, it is important to explain to people how important it is to maintain in order their property and workplace in to feel safe, thus ensuring the fulfilment of prescribed fire safety requirements. A number of public opinion polls show that the society positively assesses SFRS (State Fire and Rescue Service), trusts in SFRS and is grateful when people and their property are rescued.

Within the research period, most fires in the residential sector have taken place in the cold season and in the beginning of the heating season. Apartment house managers for various reasons do not timely commence the heating season, which results in people taking other

residential heating solutions - use various electric heaters, including homemade, sometimes heat their apartment by a gas stove or oven. By contrast, private house owners fire furnaces, stoves, fireplaces.

Electrical equipment that is used in the residential sector is not continuously monitored and maintained. Therefore, home electrical products often can cause fires. There are also cases when people are saving on the cost of repair and think that they themselves can repair electrical appliances at home. After such repairs there is a high risk of fire and saved money can turn into much greater losses.

According to SFRS information in mass media, 598 fires were registered in 2014, of which probable cause was burned soot, in 2015 - 588 cases (Leta, 2014).

Every year in more than 1,000 fires uncleaned chimneys are mentioned as a possible cause of fire, as well as faulty heating devices, violations of heating equipment operation rules. Already for more years, SFRS widely informs the public in autumn about coming cold weather with increasing number of fires where soot burns in the chimneys as well as surrounding wooden floors. It gives evidence that building owners are irresponsible - not ready for the heating season, chimneys are not cleaned or heating systems are damaged.

To study preventive measures for reduction in the number of fires implemented by SFRS, selection of necessary data was carried out as well as study of SFRS statistical data on fires within (see Fig. 1) and fire fatalities (see Fig. 2) within the last five years:

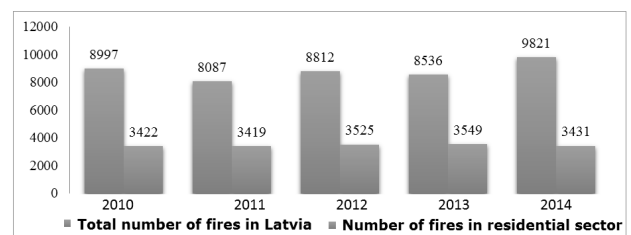


Fig. 1. Fires in Latvia within 2010 and 2014

Statistical data show that the total number of fires in Latvia within the last five years fluctuates between 8,000 to 10,000 fires per year.

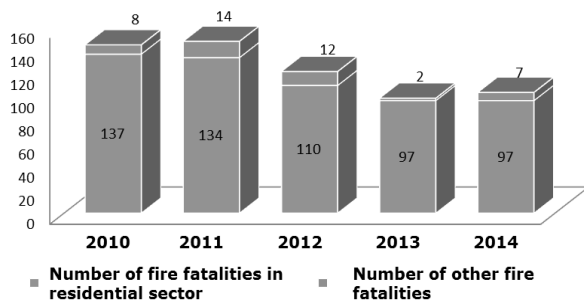


Fig. 2. Number of fire fatalities within 2010 and 2014

The number of fire fatalities in residential sector within the study period tends to decrease - from 137 at the beginning of the study period to 97 at the end of the study period.

Every year the number of fires in residential sector of regions several times exceeds that in towns of national importance. Analysing information summarized by SFRS on fires in residential sector, the potential fire causes can be divided into the following groups?: careless handling of fire; violations of heating equipment use regulations damage of electrical appliances and electrical equipment; violations of use regulations and other reasons (arson, children playing with fire, other unidentified reasons). SFRS information system registers a possible cause of the fire while the true causes in accordance with laws and regulations are investigated and established by the State Police, the number of fires according to their place of origin is shown in Table 1.

Table 1

Number of fires according to their place of origin

| | 2010 | 2011 | 2012 | 2013 | 2014 |
|--|------|------|------|------|------|
| Waste dumps, refuse, unmanaged buildings | 2464 | 2060 | 2650 | 2242 | 2992 |
| Dead grass | 2054 | 1663 | 1712 | 1764 | 2316 |
| Construction projects | 41 | 47 | 41 | 40 | 37 |
| Warehouses | 40 | 28 | 32 | 42 | 41 |
| Transport industry | 604 | 471 | 449 | 468 | 566 |
| Production buildings | 137 | 176 | 217 | 154 | 159 |
| Public buildings | 186 | 194 | 153 | 221 | 216 |
| Agriculture | 49 | 29 | 33 | 56 | 63 |
| Residential sector | 3422 | 3419 | 3525 | 3549 | 3431 |

Research results and discussion

In order to ascertain the views of Latvia residents about fire safety in residential sector and safety at workplaces, two questionnaires were developed. 200 respondents were interviewed in Riga and Jurmala on fire safety in dwellings and 100 respondents on safety, including fire safety at workplace. Respondents in the survey on fire safety in dwellings were mostly older than 50, of very different material and social position; however, people at this age still are very responsible for own and their family members' safety. Account was taken of the fact

that older people have more free time to ponder the answers to the questionnaire, but did not take into account that a significant number of respondents will be of foreign nationalities. The survey was conducted on the streets, in customer service centres, parks, supermarkets. Admittedly, the respondents willingly involved in a conversation about fire safety in own dwelling, thus replying to the questions, asked further questions, particularly about smoke detectors, their price, installation, showed interest in dwelling insurance against fire damages.

Survey on safety at workplace involved respondents of different ages who work at workplaces belonging to individuals.

Respondents in the survey on safety at workplace were asked the following questions and gave the following answers to questions included in the survey questionnaire gave (Table 2).

1) Do you feel secure at your workplace?

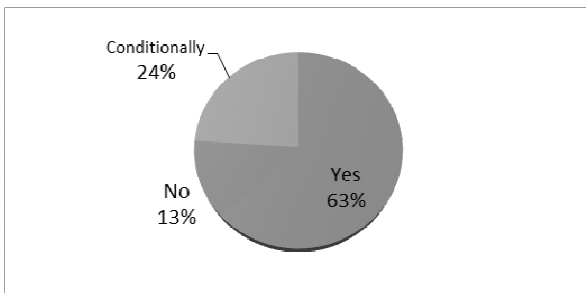


Fig. 3. Answer to question No. 1 about safety at workplaces

About two-thirds of respondents feel safe at their workplaces.

2) Are you trained in how to act in case of fire?

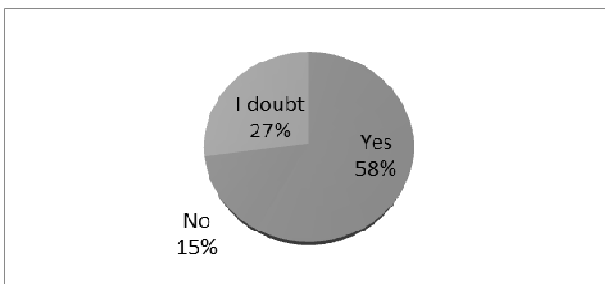


Fig. 4. Answer to question No. 2 about safety at workplaces

The survey results show that almost all respondents who feel secure at their workplaces have been trained in what to do in case of fire.

3) Do you evaluate your knowledge in the field of fire safety as sufficient?

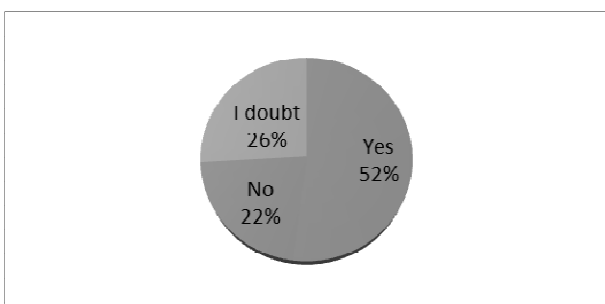


Fig. 4. Answer to question No. 4 about safety at workplaces

Approximately half of the respondents evaluate their knowledge of the fire safety as adequate, while one-quarter is not sure about it, and about a quarter admit that knowledge is insufficient. These answers show that every second respondent should work on improvement of their own knowledge and fire safety in general.

4) Have employees at your workplace been annually instructed in fire safety?

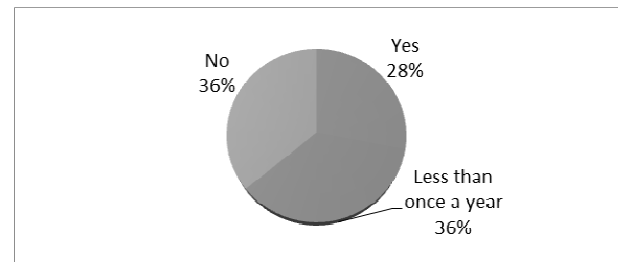


Fig. 5. Answer to question No. 6 about safety at workplaces

The respondents' answers indicate that in most cases employees have received instructions, but more than a third are not - perhaps these workers are self-employed or are working in small private companies where fire safety and security issues do not attract necessary attention.

5) How would you like to improve your knowledge of fire safety?

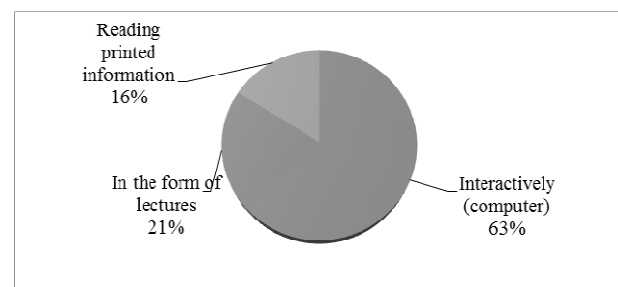


Fig. 6. Answer to question No. 10 about safety at workplaces

Respondents confirm that in the information technology era they would preferably improve their knowledge of fire safety interactively, i.e. by using the computer, mobile applications etc.

Respondents in the survey on fire safety in a dwelling were asked the following questions and accordingly expressed their opinion to the questions in the survey questionnaire.

1) Do you feel secure in your dwelling?

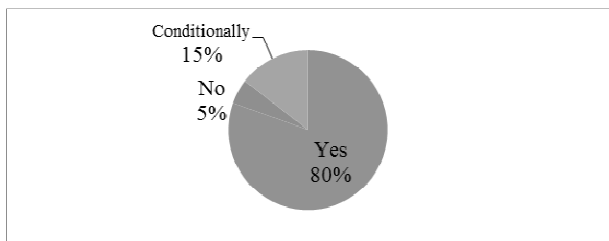


Fig. 7. Answer to question No. 1 about safety at dwelling

The majority of respondents are confident about safety at their dwelling but understand that living in an apartment building is exposed to fire hazards from neighbours and thus are concerned about safety of electric wiring in the house.

2) Do you know how to act in case of fire?

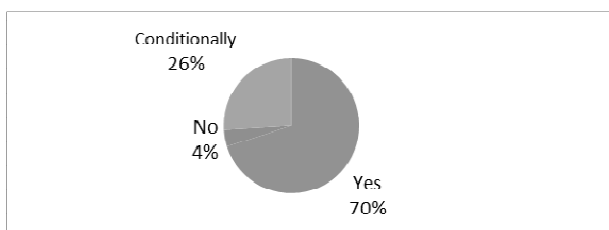


Fig. 8. Answer to question No. 2 about safety in a dwelling

The majority of respondents said they would know how to act correctly in case of fire, but a significant number of respondents were not sure about that and engaged in a conversation about the behaviour in case of fire, afterwards recognizing that their knowledge was insufficient.

3) Has ignition ever occurred in your dwelling (overturned candle, X-mas tree caught fire, burning waste, curtains etc.)?

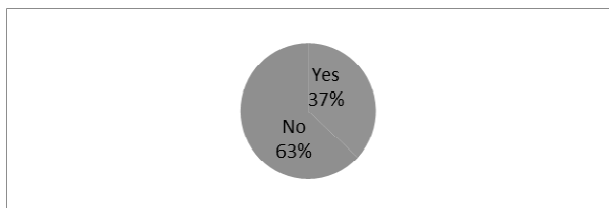


Fig. 9. Answer to question No. 3 about safety in a dwelling

The survey data show that more than one-third of respondents in their life have encountered a fire in their dwelling.

4) Did you extinguish fire yourself or called firefighters?

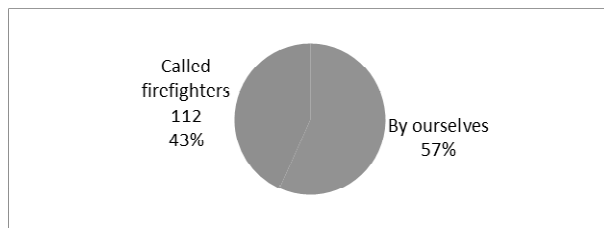


Fig. 10. Answer to question No. 4 about safety at dwelling

In most cases, the respondents have extinguished flame by themselves not allowing fire to spread.

5) Is smoke detector installed at your dwelling?

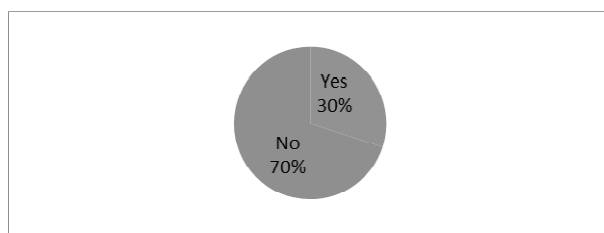


Fig. 11. Answer to question No. 5 about safety at dwelling

During the survey, the respondents showed interest in the use of smoke detectors, their installation as well as purchase options and price. Having received additional information, more respondents told that in the near future they would purchase and install smoke detectors in their dwelling.

In scope of the survey about smoke detectors carried out on SFRS website, the following information was obtained: 31 % of respondents confirmed that they use smoke detectors; 46 % told that they had not purchased them; and 23 % wanted to buy smoke detectors.

6) Do you have a fire extinguisher at home?

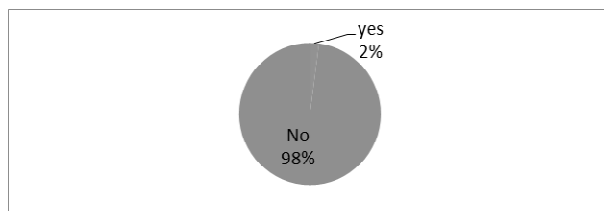


Fig. 12. Answer to question No. 6 about safety at dwelling

Survey data show that only 2 % of respondents have acquired fire extinguishers for safety of their dwelling.

7) Have you insured your dwelling against fire accidents?

measures and should certainly broaden the target audience.

To reduce the number of fires in residential sector, it is necessary to eliminate their main possible causes. Achievement of this goal, in turn, will require the continued public education on fire safety and timely informing the public about safety measures and fire-safe behaviour rules in order people with a minimum of resources could improve their safety and fire safety of their dwelling since sometimes a genuine desire and deliberation can do much.

It should be admitted that after Zolitude tragedy at the end of 2013 intensified fire safety checks in public buildings were carried out, and also people's attitude has changed considerably - we have become more attentive and careful in relation to safety. Response to the fire alarm sound signals has been improved, human escape exits have been arranged, practical training in fire safety is organized in larger and smaller public buildings.

Influence of insurance companies on fire safety

Article 1084 of Civil Law establishes that in order to protect the safety of the public, every owner of a structure shall maintain their structure in such condition that harm cannot result from it, to neighbours, passers-by or to users of it (The Cabinet of Ministers; The Civil Law, 2014).

Insurance companies offer different services to individuals, including property insurance and civil liability insurance. Property insurance against damage and loss has become one of the most popular types of insurance, including against losses and damages caused by fire. Demand determines supply, and all major insurance companies offer home insurance. Insurance companies are interested in less frequent pay-outs of insurance indemnity and possibly more insurance contracts.

Criteria are summarized, which are taken in consideration by insurers when making contracts on home insurance (see Table 2).

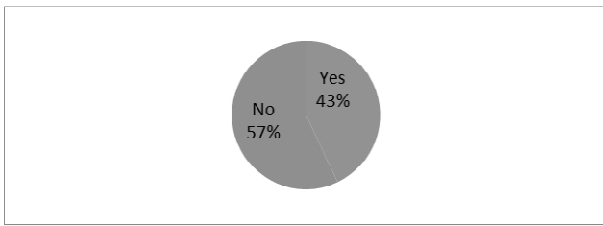


Fig. 13. Answer to question No. 7 about safety at dwelling

Almost a half of respondents have insured their dwelling against damages caused by fire, lightning strike or explosion.

8) Have you been close to the place of fire and has it urged you to do something to improve fire safety at your dwelling?

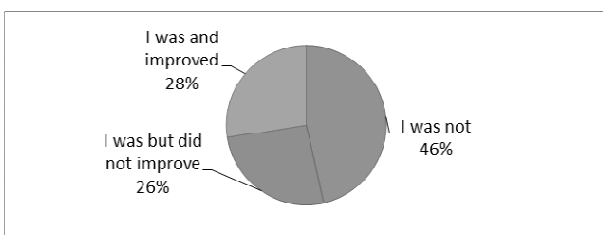


Fig. 14. Answer to question No. 8 about safety at dwelling

More than a half of respondents have seen a fire in close-up, and every second of them has thereafter improved the fire safety of own dwelling.

9) Do you know that you have the right to inform SFRS of cases where fire can break out and threaten people (unauthorized storage of flammable and explosive substances etc.)?

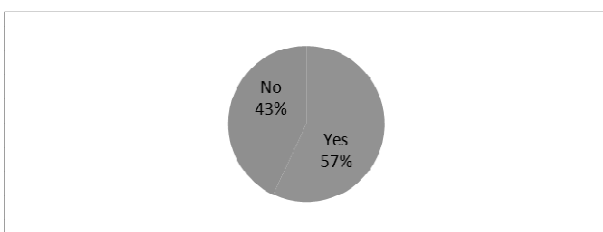


Fig. 15. Answer to question No. 9 about safety at dwelling

The majority of respondents are aware that they have the right to inform the SFRS of cases where fires threaten their housing. A number of respondents said that it was also their duty. Many would solve this problem with assistance of municipal police.

The survey results show that the respondents are interested in fire safety in their dwelling; therefore SFRS should work on new preventive

Law "On Insurance Contracts", Article 14, paragraph (2), specifies that prior to entering into an insurance contract and during the operation thereof the insurer has the right in accordance with the procedures set out in the insurance contract to inspect the insurance object in order to ascertain that changes in the initial information have not occurred (The Cabinet of Ministers; Law On Insurance Contracts, 2007).

insured only relying on information provided verbally by the policyholder.

Data summarized by "Swedbank" show that in 2012 in 56 % of home insurance cases where damages were paid, the reason was pipeline rupture and average compensation amount was 550 EUR. In turn, the greatest damages were caused to dwellings by fires, the average amount of compensation being above 5,400 EUR. Fires caused by lightning are also referable to these cases. Living in an apartment building, it is advisable to purchase also the civil liability insurance. In this case, the insurer under the terms of the contract will compensate the damages caused to a neighbour's property and health (Apollo, 2013).

Table 2

Criteria specified in home insurance forms of insurance companies

| Criteria | Balta | Baltikums | BAN | ERGO | IF | Swedbank |
|--|-------|-----------|-----|------|----|----------|
| Material of building carrying structure | + | + | + | + | + | + |
| Dwelling floor area | + | + | + | + | + | + |
| Insured amount | + | + | + | + | + | + |
| Quality of repair (finishing) | + | + | + | + | + | |
| Availability of security alarm | + | + | + | | + | |
| Sauna, bathhouse, fireplace | + | + | + | + | + | |
| Building erection year | + | | | | + | + |
| Days per year the apartment is populated | | + | + | + | | |
| Storey | | | + | | + | |
| Availability of fire alarm | | + | + | | + | |

Taking into consideration that SFRS fire inspectors carry out fire safety checks only in a small part of the residential sector, fire safety in the residential sector is dependent on the owners of apartments and apartment house managers. Management contracts concluded by the house manager with the apartment owner specify the owner's obligation to respect fire safety regulations set in regulatory enactments.

No dwelling is completely protected against fire, natural disasters or improper construction risks, which can cause damage to the dwelling and belongings, so it is recommended to carefully assess the risk coverage offered by insurers. Insurers consider as fire risk caused damages such damages and losses which are caused by fire, lightning and explosion.

Unfortunately, it is impossible to find out how often insurers use the statutory rights - check the insured object. From the standpoint of fire safety supervision, it is much more important to examine the object before its insurance. It goes without saying that for the representatives of the insurance company most important aspect is the insurance interest - not to suffer losses from occurrence of insured risk. The sum insured is an amount specified in the insurance contract for which real estate or dwelling is insured against losses and damages. In most cases, dwelling is

Looking at experience of foreign countries, such as the United States, where insurance operates at a high level, the insurers stimulate the inhabitants themselves to care for the safety of their dwelling. It is very simple: criteria are set by which the insurance premium is calculated (the amount that the insured person pays for the insurance under the contract). The more of the established criteria are fulfilled by the insured person (installed smoke detectors, alarms, replaced wiring, used non-combustible materials

for dwelling construction or repair etc.), the lower the insurance premium will be. It can be compared with premium amount of driver's civil liability insurance: the more experienced the driver is, the cheaper the insurance policy is.

Some insurance companies reduce the price of the insurance policy if fire alarm is installed in the dwelling, the price difference being not large, but it is a step forward in improvement of fire safety with assistance of insurance company. Another noteworthy positive trend over the past two years is that almost all insurance companies offer civil liability insurance for dwelling, which protects individuals against unexpected expenses incurred unintentionally thus causing damage to the property of third parties.

Conclusions, proposals, recommendations

During the study period, the number of fires has decreased in 2009, 2010 and 2012 and increased in 2011 and 2013. The number of fire fatalities over time is similar to that of fires. A pronounced seasonality of fire fatalities is observed: the highest number of fatalities is in winter months, while during warm period considerably less die in fires.

- 1) Respondents' survey results show that people consider their safety, including fire safety at workplace and at home as important, and the respondents willingly engaged in conversation about practical fire safety improvement solutions. The survey results show that respondents would prefer to improve their knowledge on fire safety in an interactive way. Since a virtual stroll through the secure dwelling is available on SFRS website, the amount of its visitors has increased significantly.
- 2) A number of insurance companies in recent years have included the availability of fire alarm as a criterion for home insurance. It will encourage people to install fire alarms in their homes thus increasing the number of people who in case of fire could escape themselves

and rescue close people as well as timely call rescuers, and hence reducing the number fire fatalities.

- 3) Effective regulatory enactments stipulate that employees, learners and students must be trained in fire safety, electrical safety, occupational health and safety, first aid and other fields; however, such fragmented system of training poses difficulties for employers, its implementation requires significant resources and professionally trained specialists.

In order to improve adults and children's knowledge of fire safety and wider involve individuals in reduction of fires and fire fatalities, the following proposals are made:

- 4) In order to coordinate education of children and adults in security issues including fire safety the Ministry of Interior should promote public safety, establish a working group for coordination of planned improvement of adult and children knowledge about various safety issues: fire safety, civil security, electrical safety, road traffic safety, labour protection, safety in places of entertainment, and other issues. The working group could involve SFRS, State Police, JSC "Latvenergo", Employers' Confederation of Latvia, Latvian Insurers Association, Latvian Firefighting Association etc.
- 5) In order to ensure the fulfilment of SFRS functions and tasks specified in laws and regulations, SFRS should improve the regulatory enactments, develop the equipment of its structural units, improve the professional knowledge and skills of its officials, also in the field of fire safety monitoring and prevention.
- 6) All these measures are aimed at effective operation of the institution, cooperation with the public and public information.

Bibliography

1. Brussoni, M., Towner, E., & Hayes, M. (2006). Evidence into Practice: Combining the Art and Science of Injury Prevention. *Injury prevention*, Volume 12(6), pp. 373-377.
2. DiGiuseppi, C., Goss, C.W., Higgins, J.P.T. (2001). Interventions for Promoting Smoke Alarm Ownership and Function. *Cochrane Database Syst Rev.*, Issue 2.
3. Hoyos, C. G., Zimolong, B. M. (2014). Occupational Safety and Accident Prevention: Behavioral Strategies and Methods. *Elsevier*, Volume 11, p. 226.
4. Ingram, J.C., Deave, T., Towner, E., Errington, G., Kay, B. (2011). Identifying Facilitators and Barriers for Home Injury Prevention Interventions for Pre-school Children: a Systematic Review of the Quantitative Literature. *Health Educ Res*, Volume, 27 (2), pp. 258-268.
5. Kendrick, D., Young, B., Mason-Jones, A.J., Ilyas, N., Achana, F.A., Cooper, N.J., Hubbard, S.J., Sutton, A.J., Smith, S., Wynn, P., Mulvaney, C., Watson, M.C., Coupland, C. (2012). Home Safety Education and Provision of Safety Equipment for Injury Prevention. *Cochrane Database Syst Rev*, Issue 9.
6. Kobes, M., Helsloot, I., de Vries, B., G. Post, J.G. (2010). Building Safety and Human Behaviour in Fire: A Literature Review, *Fire Safety Journal*. *Elsevier*, Volume 45, Issue 1, January, pp. 1-11.
7. Marshall, S.W., Runyan, C.W., Bangdiwala, S.I., Linzer, M.A., Sacks, J.J., Butts, J.D. (1998). Fatal Residential Fires: Who Dies and Who Survives? *JAMA.*, Volume 279 (20), pp. 1633-1637.
8. Rohde, D., Corcoran, J., Sydes, M., Higginson, A. (2016). The Association between Smoke Alarm Presence and Injury and Death Rates: A Systematic Review and Meta-Analysis. *Elsevier, Fire Safety Journal*, Volume 81, pp. 58-63.
9. Runyan, C.W., Bangdiwala, S.I., Linzer, M.A., Sacks, J.J., Butts, J. (1992). Risk Factors for Fatal Residential Fires. *National Center for Biotechnology Information*, Volume 327 (12), pp. 859-863.
10. Cabinet of Ministers, *Cabinet of Ministers, The Civil Law*. (Last amendments 2014). Retrieved: <http://likumi.lv/doc.php?id=225418>. Access: 20.09. 2016.
11. Cabinet of Ministers, *Fire Safety and Fire-fighting Law*. (Last amendments 2013). Retrieved: <http://www.likumi.lv/>. Access: 20.09. 2016.
12. Cabinet of Ministers, *Law On Insurance Contracts*. (Last amendments 2007). Retrieved: <http://likumi.lv/doc.php?id=48896>. / . Access: 20.09. 2016.
13. Leta, *Sogad jau 361 ugunsreks, kuru iemesls sodreji dumvada*. (2014.) Retrieved: http://www.tvnet.lv/zinas/latvija/528720-sogad_jau_361_ugunsgreki_kuru_iemesls_sodreji_dumvada. Access: 10.12.2015.
14. Apollo, *Visbiezak majoklu apdrosinasanas gadijumus izraisa caurulvadu plisumi*. (2013). Retrieved: <http://www.apollo.lv/zinas/visbiezak-majoklu-apdrosinasanas-gadjumus-izraisa-caurulvadu-plisumi/562547> Access: 10.12.2015.

RENEWABLE SOURCES OF ENERGY IN POLAND AND IN THE REGION – RESEARCH RESULTS

Malgorzata Michalcewicz-Kaniowska¹, PhD; Malgorzata Zajdel², PhD

^{1,2}, UTP University of Science and Technology in Bydgoszcz, Poland, Faculty of Management

Abstract. At the time of state-of-the-art technologies and innovative technical solutions, the energy sector is developing more and more rapidly. A growing demand for energy triggers a development of new energy generation technologies. The energy produced based on petroleum, natural gas or black coal cannot meet those requirements and, therefore, a greater and greater popularity of renewable sources of energy is evidenced. The aim of the article was to evaluate conditions and to conduct the analysis of the potential of renewable energy production in the kujawsko-pomorskie region, considering e.g. the current level of use of renewable natural resources for energy production. The article uses the desk research method, and the data for analysis were acquired from the database of the Central Statistical Office of Poland (GUS), Polish Geological Institute (PSG) and the Energy Regulatory Authority (URE). The study showed that the kujawsko-pomorskie province is a front runner in terms of the share of renewable energy in the country's total balance. Renewable sources of energy are a promising direction of development of the energy sector of the kujawsko-pomorskie province, mostly due to the conditions favourable to the development of such energy sector. The current state of the development of the energy sector is very competitive in terms of traditional methods of energy generation, which is related to many factors, mostly with availability and inexhaustibility of the natural carriers of energy.

Key words: renewable sources of energy, energy sector, energy resources, renewable energy production.

JEL code: Q42

Introduction

Ensuring the energy safety is the priority for each state in the world. It comes mostly from a growing demand for electricity, which is the driving force of the entire economy. All the fields of life, from individual households to production or processing plants, require a continuous supply of electricity. Therefore, a basic task of the Polish energy sector, as a key national economy sector, is the acquisition of energy sources and generating of energy. Energy supplies from renewables (such as from biofuels, solar heat, photovoltaics, wind, hydro, wave, tidal, geothermal, and ocean-thermal) are essential components of every nation's energy strategy. (Twidel, Weir, 2015)

Most of the world's energy is generated with primary fuels: black coal, brown coal, petroleum, natural gas or uranium. Today, those resources are still available; however, their sources are not here forever and soon, due to a growing demand for energy, people will have to change to alternative sources of energy completely. The solar, geothermal energy, the kinetic energy of the wind and water as well as biomass are our future, which starts today (Charakterystyka

paliw, 2016). Renewable sources of energy are the sources which use in the process of transforming the energy of the wind, solar radiation, geothermal energy of the waves, currents and sea tides, river falls and the energy produced from biomass, waste biogas as well as biogas produced by sewage discharging or management or the decomposition of the plant and animal residue stored (Energy Law Act, 2007). Under Art. 4 of energy regulation (Regulation of Minister, 2004) produced in renewable sources of energy include, irrespective of the power of the source, the electricity or heat derived from, especially:

- water and wind farms;
- sources producing energy from biomass and biogas;
- from solar cells and collectors for heat generation;
- from geothermal sources.

The aim of the article was the evaluation of the conditions and the analysis of the potential of use of renewable energy in the kujawsko-pomorskie province, considering e.g. the current level of use of renewable natural resources for the production of energy. The article also

¹ Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

provides characteristics of the energy sector in Poland, as well as the analysis of demand for electricity in various sectors of the economy. Besides, it defines the key internal energy carriers mined in the country; black and brown coal, natural gas and petroleum. It also presents the problem of producing energy in terms of the energy policy. The study analyses the resources of a given energy carrier and the current level of renewable energy sources technologies' development based on a given material. Similarly, the key limitations to their development have been presented.

The article uses the desk research, and for the purpose of the analysis, the data has been acquired from the database held by GUS, PSG (Polish Geological Institute) and URE (Energy Regulatory Office). The analysis has involved data composition and decomposition to execute the aims.

Research results and discussion

A growing popularity of production of the energy from unconventional sources is determined not only by the availability of the resources but also by a growing need of the natural environmental protection. Energy from water or wind does not generate a vast amount of pollution to the atmosphere as in the power plants operating based on traditional sources. Besides, a growing awareness of the society about the need of environmental protection makes the number of proponents of energy production from alternative energy sources increase. The world sees the need of an on-going development of that type of technology which, in a near future, can become one of the key methods of energy generation. To promote the renewable energy sector development, many states globally, including Poland, increase their inputs for renewable energy sources' technologies each year. Such approach aims at enhancing the importance of energy produced that way to make it alternative for that produced from carbon or petroleum. In the future, such

approach will allow even for giving up the energy generation from traditional sources completely. A special role in that process is played by the European Union, which already in the 1990s initiated the process of activating the renewable energy sector. The tool for the 'clean' energy production popularisation and development is e.g. the energy sector policy. With various instruments, it is trying to motivate the EU Member States to increase the production of energy from alternative sources. Thanks to such policy, there has been recorded a considerable progress in the renewable energy sources sector development in many states, including Poland.

According to the reports by the GUS, the greatest electricity consumers are households, mostly due to a high energy consumption of household appliances and systems. The highest electricity consumption by Polish households is generated by heating houses and apartments, heating water, cooking meals, lighting and household appliances and TV and radio equipment. For a dozen or so years, there was observed, however, a decreasing tendency of energy consumption for heating houses and apartments, which comes mostly from a change in heating systems to gas and electricity systems. A similar situation was observed for lighting, which is an effect of introducing energy-saving bulbs on the market.

After households, the next biggest energy consumer is transport with the most energy-consuming being road transit consuming as much as 94 % of the total energy used by transport, followed by rail transport - 2 % and air transport - 3 %. An inconsiderable demand for energy is seen from inland waterways and near-coastal voyage. As for rail stock, there is reported a regular decrease in energy consumption, unlike the road transport, which is still the most energy-consuming transport sector.

Industrial facilities consume 23 % of energy, much ahead of services and agriculture. The stability of supplies of that material conditions

¹ Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

the continuity of production, and so it is necessary to ensure the security of energy transit to many branches of industry. Depending on the production profile, the plants show a varied demand for energy. As reported by GUS in 2015, in 2003-2013 most, namely 55 % of the total energy consumed by industry, was attributed to steelworks, industrial plants and mineral facilities. An increase in energy consumption can be mostly observed in timber, paper and mineral industry. Today, thanks to the use of less energy-consuming technologies and installations, there is reported a decrease in the amount of energy consumed in that economy sector, especially in machine, textile or steelwork industry.

A high level of mechanization of today's agriculture makes that economy sector one of the major energy consumers. It is especially visible on orchard-growing farms or dairy farms and large-acreage farms with their mainstay being cereal and animal feed production. According to GUS, electricity consumption in 2009 for production purposes in agriculture, without factoring in the household needs, was 1 610 GWh.

The service sector, as one of the biggest and most dynamically developing sectors of Polish economy, is among those with lower energy demand. In 2013, energy-consumption was 0.05 kgoe/euro05, with a regular decrease in energy consumption by an average of about 1.2 %, which can be due to the launch of state-of-the-art solutions and technology facilitating an electricity consumption decrease.

For an adequate operation of the electricity system, as the driving force of the economy, it is necessary to develop short and long-term electricity demand forecasts. Making such analysis one must consider the changing tendency of the electricity demand not only in Poland but also globally. General energy consumption trends globally affect not only the energy price but also energy availability, and

thus one must consider the global electricity market. The forecasts assume that by 2030 there will have been reported a considerable increase in electricity consumption, as compared with 2006 due to an intensive development of various sectors of economy, including high-energy-consuming technologies and installations. The key role in the energy sector will be played by the technologies of renewable sources of energy, which, according to the estimates by 2030, are to account for 15 % of the share in the total energy structure. (Poplawski T., 2014).

Characteristics of Poland's internal energy resources

Black coal is a mineral formed as a result of a long-term accumulation of the plant material under anaerobic conditions. As reported by the Polish Geological Institute, in Poland there have been identified as many as 155 deposits of black coal, of which 48 are actively exploited, while 3 are under construction, and 55 coal deposits are not managed. Mining of 49 deposits was stopped due to low cost-effectiveness. The most dynamically exploited is the Upper Silesian Coal Basin, which covers almost 5 600 km² and accounts for more than 80 % of the country's coal resources. Brown coal, on the other hand, is a sedimentary rock formed as a result of a regular accumulation of organic matter, which under anaerobic conditions gets charred. Its resources are located all across the country; however, the greatest concentration of the deposits occurs in the formations of neogene and paleogene. In Poland, you can find 90 documented deposits of brown coal. Similarly, as for black coal, there is reported a decrease in the amount of brown coal mining.

Natural gas is yet another natural fossil fuel formed from the decomposition of organic matter at increased temperature and pressure, with no access to oxygen. Today, one can differentiate between two types of natural gas deposits: traditional – mined from sedimentary rocks with a capacity for storage of gas and its permeability,

¹ Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

as well as the alternative ones, including tight gas, shale gas as well as carbon deposit methane. Over the recent years, a special attention has been paid to shale resources of natural gas. According to the estimates, the resources of gas accumulated in shales in Poland can range from 1000 to 3000 bn m³. There is observed a decreasing tendency in terms of the amount of the gas received. However, only at the turn of 2013/2014 there was reported almost a 4 % decrease in the amount of the gas excavated.

Petroleum is one of the most common energy sources in the world. As reported for 2014, in Poland there were 85 documented petroleum deposits, of which 67 today are being managed, 7 deposits have not been used yet and for 11 – the use was abandoned. At present, the Polish petroleum resources become, however, smaller and smaller and cannot meet a high demand for that material; hence the need of imports. Almost 97 % of the petroleum used comes from abroad, mostly from Russia. (*Polityka energetyczna*, 2016). (Wielewska, 2015)

Renewable energy in Poland as compared with other countries

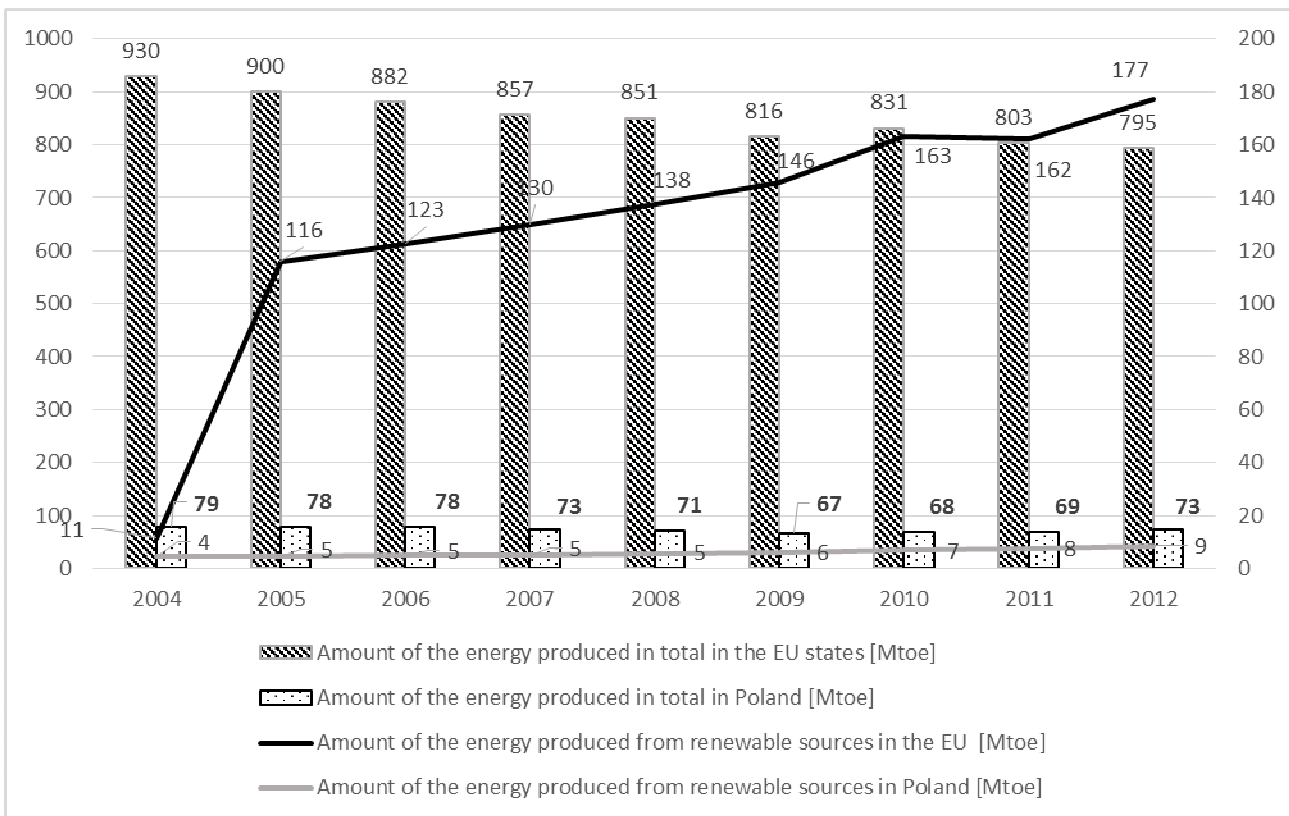
A regular increase in the demand for energy, connected with a gradual exhaustion of traditional energy materials, makes many countries develop new technologies of generating electricity. One of the best alternatives for the energy sector based on petroleum, gas or coal are renewable sources of energy. The historic development of renewable energy sources in the electricity (RES-E) sector is addressed on Member State and on sectoral level as well as consequently discussed according to available RES-E potentials and costs. (Reece, 2011).

The greatest challenge for the contemporary energy sector in Poland is decarbonisation, which assumes abandoning of mining and processing of

black coal. However, giving up the energy production from carbon, for such countries as Poland, where power plants use mostly that material, is unreal. For many countries, coal remains a factor conditioning the energy security. Every time the specialists all over the world try to find a solution to that predicament, the renewable sources of energy are considered. Those technologies are to offer an alternative to black coal polluted with sulphur and other pollutants. Over a dozen or so years, most countries have made an enormous progress in terms of the development of that energy sector. Increasing the share of clean energy in the total energy balance is becoming a priority. Poland, in terms of development in that field of energy generation, has also made a considerable progress (Figure 1). The amount of the total energy generated in the EU, in the period analysed, shows a decreasing tendency; there has been reported a decrease by about 135 Mtoe (million tonnes of oil equivalent), whereas the amount of the energy generated from renewable sources of energy increased by 166 Mtoe. Poland recorded a similar tendency; a decrease in the total energy generated and an increase in the energy generation from renewable sources of energy by 4.3 Mtoe. The research shows that still 9 years ago the European share of renewable sources of energy in the total balance accounted for 12 %, however already in 2012 it accounted for 22.3 %. The most dynamic increase was reported at the turn of 2003 and 2004 with a more than 2 % increase in the amount of energy produced from renewable sources. A growing tendency in that sector is also observed in Poland. In 2004, renewable sources of energy accounted for 5.5 % in the total energy balance and within 8 years more than 6 % increase was noted. In 2012, such energy accounted for 11.7 % of the total (Figure 2).

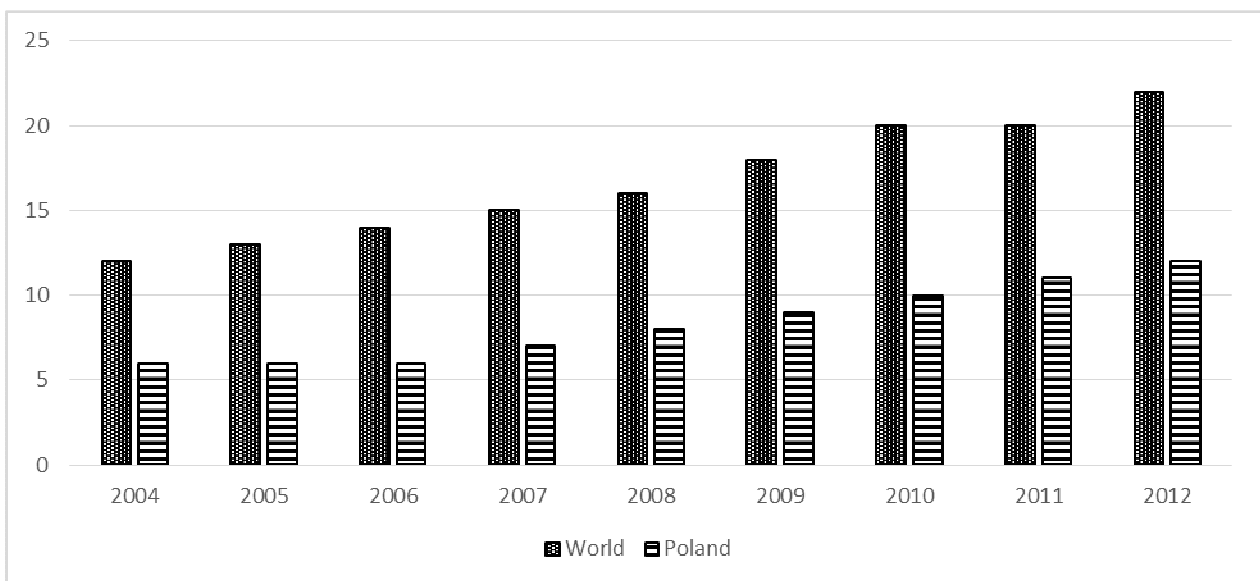
¹ Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl



Source: authors' study based on reports by GUS

Fig. 1. Comparison of the production of primary energy considering renewable sources in Poland and the European Union in 2004-2012



Source: authors' study based on the reports by GUS

Fig. 2. Increase in energy production from renewable sources in Poland and in the EU in 2004-2012 (%)

Conditions of the use of renewable energy in the kujawsko-pomorskie province

Wind energy resources

The basic condition of using the wind as an energy carrier is its speed. For the wind turbines to produce energy from the wind effectively, the speed must be not less than 4m/s. Wind turbines

operate most effectively at the wind speed up to 25 m/s (2013 only). Based on the on-going studies and observations of the Institute of Meteorology and Water Management, it was found that most of the country provides conditions favourable to the development of such technology. The mean wind speed in Poland

¹ Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

ranges from 3.5 to 4.5 m/s. To make a credible estimate of the volume of energy resources of the wind, one must consider both its speed and the frequency of the re-occurrence of respective speeds (Chochowski A., 2008).

The best conditions for the development of wind farms are found in northern and north-eastern parts of Poland. The annual average wind speed there is not less than 4.5 m/s. Most of the kujawsko-pomorskie province is located within the so-called third zone with favourable conditions. Many-year research by Prof. Halina Lorenc of the Institute of Meteorology and Water Management shows that the mean total energy of the wind per 1 m² in Poland is 1000-1500 kWh/year, and for the kujawsko-pomorskie province it is about 1000 kWh/m²/year. The location of wind farms as well as the annual mean wind speed, are also affected by other factors such as landscape, including land roughness, which has a considerable effect on the horizontal speed of air masses. The most favourable are the areas with minimum roughness which do not decrease the wind blowing rate. In most cases, the wind turbines in the kujawsko-pomorskie province are located in arable fields and meadows where roughness of the area is inconsiderable. The other factors conditioning the success of wind farms are determining the wind energy potential. For the kujawsko-pomorskie province, it is 47932.2 MW of installed power and 104683488 MWh/year of generated energy. Of same importance it is to determine the economic potential, which is a corrected theoretical potential. It considers only the area with the most favourable windiness conditions, and so for the kujawsko-pomorskie province – almost 30 % of the areas, which gives the economic potential of 31405046 kWh/m²/year. Market potential is also calculated; it equals 9421513.8 MWh/year of the annual value (Zasoby i mozliwosci, 2008). As for 2009, according to detailed reports on the number and distribution of wind farms in respective communes in the kujawsko pomorskie

province, the number was 252; most in the communes of Pakosc – 23, Kruszwica – 19, Dobrzyn nad Wisla – 19 and Aleksandrow Kujawski – 14. The highest power was reported for the wind farms situated in the communes of Dobrzyn nad Wisla (34300 kW), Kruszwica (12675 kW), Pakosc (5585 kW) (Table 1). A comparison of the number of wind turbines in 2009 and the number today, one can see a growing tendency. Interest in such installations has been still growing, which comes from e.g. a growing technological advancement and the availability of such devices. Today on the Polish market, one can find many firms specialising in the construction of wind farms. The energy generated from that energy carrier is used in various sectors of economy. Investors are eager to erect new wind turbines, which with time show very cost-effective. Electricity generated by turbines is introduced to the electricity network and transferred further to consumers.

The technology of generating energy from the wind is effective when the wind speed in a given area is not lower than 4 m/s. Important limitations to free wind movement can be due to e.g. landscape, air temperature, roughness, namely the type of the land cover, the presence of bigger water reservoirs, or obstacles in the area (built structures, big trees etc.).

Other important limitations to the development of wind energy sector are sociological conditions. Wind turbines generate noise and vibrations, which has a negative impact on the environment and the man. Besides, the turbines' operation is accompanied by the shadow effect, which can be onerous for the people living in a close vicinity to the wind turbine. To minimise the negative impact of such system, it is recommended for the turbines to be located further than 500m from the built-up zone. However, one should remember that such a distance does not guarantee the elimination of all those negative aspects of the wind turbine operation. The residents of the kujawsko-

¹ Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

pomorskie province, as one of the provinces with the biggest number of turbines, try to defend themselves from the next plans of construction of such facilities. Additionally, the devices alongside with generating noise and vibrations, have a negative effect on the aesthetic qualities of the landscape, which in the areas visited by tourists can be some obstacle.

Water energy sector development conditions

A constant water movement in hydrosphere and its energy potential make water to be eagerly used for the production of the so-called "clean energy". The amount of water resources in Poland is estimated as 13-14 bn kWh/year (Krasowski E., 2001). The water energy resources of the kujawsko-pomorskie province, however, are not high. Due to an inconsiderable annual total precipitation and a high ground permeability, the development of hydropower technologies is inconsiderable. The province is located in the catchment of the Vistula and Odra Rivers. A characteristic feature of the region is the Vistula River flowing through the central part. The total length of that biggest Polish watercourse, going through the province, is 205.3 km. Besides the following goes across the Notec River at the length of 127 km, the Drweca River 116.8 km, Brda River 111 km, Zgłowiaczka River 79 km as well as the Wda River - 62 km. The catchment basin of the Vistula River covers about 70 % of the area of the province with numerous tributaries of smaller rivers; with the left tributaries: the Zgłowiaczka River, the Tazyna River, the Brda River and the Wda River, and the right tributaries: the Skrwia River, the Mien River, the Drweca River, the Struga Torunska River and the Osa River. Only the western and south-western part of the province is located in the catchment of the Odra River, which accounts for 30 % of the area (Amendment to resolution, 2013). The biggest potential is offered by the Vistula River. It offers the greatest energy resources, above 330 MW.

The other rivers of the region show low values of that index. The potential of the use of waters for energy production is mostly determined by the rate of individual flows, which, depending on the size and winding of the river, will vary. The biggest flow per unit in the province is reported for the Vistula River; from 921 to 1012 m³ of water per second. In the kujawsko-pomorskie province, 49 hydroelectric power stations operate. Most of them in the swiecki county, and the least – in the torunski and lipnowski counties. The power of the facilities in respective areas varies a lot. In most cases, the hydropower stations in the province show an inconsiderable power. A vast majority are the systems up to 0.03 MW, whereas the power plants with production capacity over 10 MW are least numerous. The solar power plants in the province most essential for the energy sector are six installations. One of the biggest and most efficient ones is the run-of-the-river hydroelectricity in Włocławek. They generate 90 % of the energy produced in the hydroelectric power station across the province; the other water power than the one in Włocławek: the installation in Koronowo-26 MW, Zur- 8MW, Smukala 4.2 MW, Tryszczyn 3.4 MW, Grodek 3.5 MW. The total power of those power plants is about 2.47 MW (Table 1).

The most essential obstacles to water energy sector is the environmental protection. Since the installations interfere considerably in the operation of the area, they are considered the investments which are unfavourable to the environment. The construction of water power plants required the establishment of the retention tank, which is a consequence of the construction of the dam for damming the water up, which brings a real risk of flooding the areas in the closest vicinity of the river.

Solar energy sector development conditions

The solar radiation energy has a big chance of becoming a serious competition for traditional

¹ Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

methods of generating energy, mostly due to its inexhaustible resources. The only condition of processing of solar radiation into electricity is an adequate isolation. Insulation is expressed with the amount of solar energy per area unit in a given time (MJ/m^2). Poland is found in the climate zone with an uneven distribution of solar radiation cycle. A vast majority of the total sum of insolation coincides with winter-summer period. The sunshine in our country is available about 16 hours a day, in winter – no more than 8 hours. (Gronowicz J., 2008). Less favourable conditions in the kujawsko-pomorskie province make the use of the sun as energy carrier in that area inconsiderable. Most frequently, such installations occur in a form of single sun collectors (Table 1) used for water heating for detached houses, agritourism as well as recreation and leisure facilities. The energy generated is used in the kujawsko-pomorskie province also to provide power supply to traffic lights, parking meters or road signs.

Insufficient annual total solar radiation is the most serious obstacle to the solar energy sector development in Poland. The nature and structure of the solar radiation energy beam limits the construction of a greater solar installation. Poland's climate zone, with a low number of sunny days per year and a long winter period, inhibits such development substantially.

Conditions for the geothermal sources' energy sector development

As a result of breakdown of radioactive elements of uranium, thorium and potassium inside the earth, Earth's core gets heated up to the temperature of about 5000°C (Ciechanowicz W., 1995). Geothermal energy is received in a form of water or water vapour heated by the Earth's core. It is assumed that water at the temperature exceeding 120°C is adequate for electricity generation. The kujawsko-pomorskie province is abundant with geothermal waters. Here the total of all the resources is $1.36 \text{ E}+18$ J/year, which corresponds to $3.09\text{E}+7$ TOE/year

(Chochowski A., 2008). The kujawsko-pomorskie province is one of the most abundant. The existence of such waters has been documented e.g. in Ciechocinek, Janiszewo k/Lubranca, Rządka Wola in the vicinity of Brzesk Kujawski as well as in Marusza k/Grudziadz (Table 1). The sources are mostly used for recreational and health-resort purposes due to its rich mineral composition. The geothermal waters in Ciechocinek, at the depth of 1300 m. under sea level, were discovered first; about the 10th century. The deposits at Marusza are slightly deeper than in Ciechocinek; about 1630 m, and similarly as the other source, well-mineralised brine at the temperature up to 40°C is used for health-resort purposes. The deposits of heated water or water vapour referred to as geothermal sources occur at various depths. As long as such deposits are located at little depths under the surface of the earth, their extracting and processing is relatively simple and cheap. However, most geothermal sources in the kujawsko-pomorskie province are located at considerable depths, which becomes the principal barrier for material acquisition. The work related to the use of the deposit deep in the Earth Crust is extremely capital-consuming, which makes extracting such waters simply not cost-effective.

Conclusions, proposals, recommendations

1) Renewable sources of energy are a promising direction of the energy sector of the kujawsko-pomorskie province, mostly due to favourable natural conditions for the development of such energy sector, allowing for investing in various technologies and systems of alternative energy generation. Wind energy sector becomes especially promising; in that region, it is a dominant form of producing energy from renewable sources. Similarly, high development prospects are found for the energy accumulated in geothermal waters. Although their properties do not allow for energy

¹ Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

processing into electricity at industrial scale, there is much chance of success of small heat pumps.

- 2) The current state of the energy sector is very competitive in terms of traditional methods of generating energy. It is related to many aspects, however, mostly with the availability and inexhaustibility of natural energy carriers. It

is a special advantage at the time when most traditional carriers are considerably consumed and attentiveness to the natural environment is especially important. Permanently, the amount of energy recovered in that way will be increasing, which will marginalise the traditional power plants based on solid fossil fuels.

Table 1

Breakdown of use of renewable energy in the Kujawsko-pomorskie province

| Counties | Number of wind farms | Power of wind turbine system [MW] | Number of water systems | Power of water systems [MW] | Area of sun collectors | Amount of energy produced [kWh/M2/year] | Number of geothermal deposits |
|---------------------|----------------------|-----------------------------------|-------------------------|-----------------------------|------------------------|---|-------------------------------|
| Nakielski | 4 | 2 | 3 | 0.45 | - | - | 1 |
| Sepoleński | 1 | 4 | - | - | - | - | 2 |
| Tucholski | 3 | 2 | 5 | 0.65 | 104 | 52000 | 5 |
| Swiecki | 1 | 13 | 10 | 12.6 | 56 | 2800 | 8 |
| Chelminski | 15 | 11 | - | - | 234 | 117000 | 5 |
| Torunski | 7 | 8 | - | - | 369 | 184500 | 8 |
| Zninski | 11 | 14 | 3 | 0.38 | 27 | 13500 | 6 |
| Mogilenski | 7 | 10 | - | - | - | - | 4 |
| Inowroclawski | 36 | 48 | - | - | - | - | 8 |
| Radziejowski | 39 | 89 | - | - | 24 | 12000 | 6 |
| Wloclawski | 36 | 31 | 2 | 0.11 | 94 | 47000 | 11 |
| Lipnowski | 18 | 46 | 1 | 0.05 | 210 | 105000 | 8 |
| Aleksandrowski | 22 | 23 | - | - | 108 | 54000 | 6 |
| Golubsko-dobrzynski | 10 | 10 | 3 | 0.07 | 20 | 10000 | 5 |
| Grudziadzki | 10 | 99 | 5 | 0.9 | 336 | 168000 | 5 |
| Wabrzeski | 6 | 7 | - | - | 18 | 8750 | 3 |
| Rypinski | 13 | 18 | - | - | 32 | 1600 | 5 |
| Bydgoski | 7 | 5 | 3 | 29.3 | 191 | 95700 | 8 |
| Brodnicki | 17 | 18 | 5 | 0.17 | 388 | 54000 | 9 |
| Town of Wloclawek | - | - | 1 | 160.2 | - | - | - |
| Town of Grudziadz | - | - | 2 | 0.07 | - | - | - |
| City of Bydgoszcz | - | - | 5 | 5.88 | - | - | - |

Source: Authors' study based on "Zasoby i mozliwosci wykorzystania odnawialnych zrodel energii na terenie wojewodztwa kujawsko-pomorskiego", <http://www.biuro-planowania.pl/download/OZE-tekst.pdf>, Access: 17.12.2016

- 3) The process of the erection of the installation for processing natural energy carriers is related to many difficulties, e.g. spatial and environmental, infrastructural or social barriers. In many places, where the location of those installations would seem perfect, it is not possible due to the occurrence of protected areas or a specific nature of building

structures. Additionally, besides an increasing social awareness about the need of the development of renewable energy sources sector, in many cases the idea of the implementation of specific technology is severely criticised.

- 4) The research has shown that the kujawsko-pomorskie province is in the lead in terms of

the share of renewable energy in the country's total balance. It appears that the society is eager to invest in a promising sector of Polish economy knowing that it can be a very lucrative investment. Despite high financial

inputs for the purchase of technologies, the break-even point will come soon and the energy produced can meet the household needs.

Bibliography

Journal paper with author(s)

1. Gronowicz, J. (2008). Niekonwencjonalne źródła energii (Alternative sources of energy). Instytut Technologii Eksploatacji, Radom, p.72
2. Michalcewicz-Kaniowska M, Zajdel M. OZE szansą na zwiększenie niezależności energetycznej. Zrównoważony rozwój lokalny obszarów wiejskich – Europa inwestująca w obszary wiejskie (RES opportunity to increase energy independence. Sustainable local development of rural areas - Europe investing in rural areas), Tom II, Szczecin 2012, s. 29-43.
3. Poplawski, T., (2014). Prognoza zapotrzebowania na energię elektryczną i moc szczytowa dla Polski do 2040 roku (Forecast of Poland's demand for electricity and peak power by 2040), Wydawnictwo Politechniki Częstochowskiej, Częstochowa, p. 58
4. Reece G., Ragwitz M., Resch G., Panzer Ch., Haas R., Heldb A., A historical review of promotion strategies for electricity from renewable energy sources in EU countries, Renewable and Sustainable Energy Reviews, Volume 15, Issue 2, February 2011, Pages 1003–1034
5. Rozporządzenie Ministra Gospodarki i Pracy z dnia 9 grudnia 2004 r. w sprawie szczegółowego zakresu obowiązku zakupu energii elektrycznej i ciepła wytworzonych w odnawialnych źródłach energii. (Regulation of Minister of the Economy and Labour of 9 December 2004 on a detailed scope of obligation of the purchase of energy and heat generated from renewable energy sources). (Dz.U. 2004 no 267 item. 2656).
6. Tytko, R., (2013). Urządzenia i systemy energetyki odnawialnej (Renewable energy devices and systems), Wydawnictwo i Drukarnia Towarzystwa Słowaków w Polsce, Krakow, p. 137
7. Ustawa z dnia 10 kwietnia 1997 r. Prawo energetyczne (Energy Law Act of 10 April 1997) (Dz. U. of 2006)
8. Wielewska I., Smuga-Kogut M., Prus P., Zajdel M., Michalcewicz-Kaniowska M., Możliwości produkcji biomasy na cele energetyczne w województwie pomorskim (The possibility of producing biomass for energy purposes in Pomorskie), Roczniki Naukowe SERiA, 2015, tom XVII ,zeszyt 5, s. 329-335
9. Załącznik do uchwały Nr XLI/693/13 Sejmiku Województwa Kujawsko-Pomorskiego z dnia 21 października 2013 r, Strategia rozwoju województwa kujawsko-pomorskiego do roku 2020 (Amendment to Resolution No XLI/693/13 of the Kujawsko-Pomorskie Province Parliament of 21 October 2013, The kujawsko-pomorskie province development strategy by 2020), Torun 2013, p. 68.

Books

10. Chochowski, A., Krawiec, F., (2008). Koncepty zasoby, strategie, struktury, procesy i technologie energetyki odnawialnej, (Renewable energy sector concepts, resources, strategies, structures, processes and technologies) Wydawnictwo, Difin, Warszawa, p.274
11. Ciechanowicz, W., (1995., Energia, środowisko i ekonomia (Energy, environment, economy) Wydział Instytutu Badań Systemowych PAN, Warszawa, p.49
12. Krasowski, E., Krasowska, M., (2001). Gospodarka energetyczna w rolnictwie (Energy management in agriculture)Wydawnictwo Akademii Rolniczej w Lublinie, Lublin, p. 156
13. Twidel J., Weir T., Renewable Energy Resources, Routledge 2015, p 35

Internet sources

14. Charakterystyka paliw stosowanych w energetyce. Access:10.12 2016: Retrieved: http://www.elstudento.org/articles.php?article_id=893
15. International Energy Agency, Polityka Energetyczne Państwa MAE, France 2016: Retrieved: <https://www.iea.org/publications/freepublications>, Access: 05.12.2016
16. Kujawsko-Pomorskie Biuro Planowania Przestrzennego i Regionalnego, Zasoby i możliwości wykorzystania odnawialnych źródeł energii na terenie województwa kujawsko-pomorskiego, Włocławek 2008, Retrieved: <http://www.biuro-planowania.pl/download/OZE-tekst.pdf>, Access: 17.12.2016

SHAPING THE COMMON ORGANISATION OF AGRICULTURAL MARKETS IN THE NEW PROGRAMMING PERIOD (2014 – 2020)

Bartosz Mickiewicz¹, PhD, Professor, **Irina Pilvere**², PhD, Professor

¹West Pomeranian University of Technology in Szczecin, ²Latvia University of Agriculture

Abstract: The elaboration compares the regulation from 2013, including the current regulation of the common organisation of agricultural markets, and the previous regulation from 2007. The provisions from 2007 significantly changed the whole legal and organisational structure of existing sectoral agricultural markets. Independent structures of single sectoral markets were replaced with the single common organisation of the agricultural market. The new EP and Council Regulation from 2013 constitutes the continuation of directions of changes implemented in 2007. Moreover, the horizontal approach to market regulation has been maintained that leads to further moving away from the sectoral approach. The regulation integrates previously delegated provisions in one act which allowed for taking the comprehensive look at the way of conducting market policy. The agricultural market has been extended to include three new sectors, that is, the markets of apiculture products, silkworm rearing as well as ethyl alcohol of agricultural origin. A comprehensive look at agricultural markets in the European scale is not always reflected in all member states. The lack of regulations in the EU legislation results in the fact that the decisions take the form of self-execution, not always consistent with European decisions.

Key words: agricultural markets, programming, financing, regulations.

JEL code: Q18

Introduction

The EU regulations concerning sectoral agricultural markets have been evolutionarily shaped within the framework of the common agricultural policy. The initially applied sectoral (industrial) approach was subject to numerous interventions supporting both the producers and agri-food processors. Such an agricultural market organisation system allowed for the real EU intervention in the area of supporting the agricultural market participants. The regulations involved activities aimed at determining prices, subventions and compensations as well as rules of storage and distribution and mechanisms of export and import stabilization. The established common price policy was based on common criteria and uniform methods of calculation. The fundamental element of an agricultural markets organisation was the guarantee-price system, regulating both the prices on the internal EU market and in trading with third countries.

The common European agricultural market functioned on the basis of the principle of uniformity of the internal market associated with free circulation of goods and capital within the Union. At the same time it functioned, after elimination of internal duties and other trade barriers, in the form of quotas. In fact, this

market functions under the principle of equal treatment of goods coming from the EU member states. Another principle was related to the common foreign policy in respect of the trade in agricultural products with the preference, at the same time, given to home goods. In other words, agricultural products from the Union were given priority over the products imported from third countries. It was highly important to apply uniform mechanisms of agricultural intervention in relation to agricultural crops and products by adjusting the level of national prices to the level of agricultural revenues and through strict control of importing goods outside the Union. As a result, European authorities gained the competency to make decisions in the scope of setting agricultural prices and implementation of other intervention instruments.

Within the framework of market policy, several groups of commodity markets of sectoral (industrial) character had been identified that were subject to various agricultural interventions. The selected commodity sectors included markets of plant production (crops, cereals, feed, rice, etc.), animal production (beef, veal, pork, mutton, etc.), fruit and vegetable products as well as other agricultural products not subject to

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

strict market regulations (Mickiewicz, Mickiewicz 2014).

The subject, aim and methods of the research

A common organisation of agricultural markets provides a uniform legal framework governing domestic and foreign trade and quality control at the European level as well as it carries out transactions, exchange and supply of basic food products for people. The European Agricultural Guarantee Fund (first pillar of the Common Agricultural Policy) includes direct payments, market intervention and veterinary measures. EAGF financing for the common organisation of agricultural markets, unlike direct payments, is not allocated in advance for the 2014 – 2020 period. The annual financial needs are specified in the draft budget for a given financial year. The mechanism of price support involves the needs of each agricultural sector as well as their interdependencies. Measures take the form of public interventions on the markets of agricultural products. Market policy has been introduced to ensure market stability and appropriate standard of life for agricultural society through the mechanism of price support.

The aim of the elaboration is to present the changes, in the scope of the common organisation of agricultural markets from 2007, in relation to the new legal regulations introduced on agricultural markets in the regulation of the EP and the Council from 2013 embracing the 2014 – 2020 programming period. New regulations aimed at harmonizing and simplifying the rules, and particularly those, which covered more than one agricultural sector. A new normative document introduces innovations leading to upgrading the tasks of private entities in order to support supply in the agricultural and food sector. It also introduces regulations in the scope of agricultural products sale agreements that apply to the processing industry and distribution. In the paper there were used methods of induction in order to draw general

conclusions from individual observations and synthesis with deduction for achievement of output of the known and already proven general theorems.

The elaboration is mainly based on the European legislation, regulating the common organisation of agricultural markets, from 2007 and 2013 as well as the report of the Commission for the EP and the Council.

The common organisation of agricultural markets in the light of the TFEU

The Treaty on the Functioning of the European Union (TFEU) from 2009 demonstrates fundamental structural changes in the process of European integration and in the part related to the Common Agricultural Policy, it indicates the need to unify agricultural markets. In general, in title III the Treaty regulates the issues related to agriculture and fisheries and the Union provides that it shall implement a common agriculture and fisheries policy. In turn, the internal market was extended to agriculture, fisheries and trade in agricultural products. Article 38 defines agricultural products as products of the soil, of stockfarming and of fisheries and products of first-stage processing directly related to these products. Food products are regarded as second-stage processing products and, therefore, they do not belong to agricultural products. Importantly, products subject to provisions in 'agriculture' part are not directly referred to in the Treaty, but they are listed in appendix I to the TFEU. The aim of the common agricultural market in relation to agricultural markets is to stabilise markets, guarantee transport safety and ensure that supplies reach consumers at reasonable prices. The operation and development of the internal market for agricultural products must be accompanied by the establishment of a common agricultural policy.

Art. 40 of the TFEU provides that in order to attain the objectives of the common agricultural policy, a common organisation of agricultural

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

markets shall be established, which shall take one of the following forms, depending on the product concerned: 1. common rules of competition; 2. compulsory coordination of the various national market organisations and 3. a European market organisation. The common organisation's objective was to exclude any discrimination between producers or consumers within the Union. In general, common competitive rules consisted in the elimination of national elements of markets organisation that distort competition. A European market organisation constituted the most developed and the most expanded form of a common market organisation (TFEU, 2009). Any common price policy shall be based on common criteria and uniform methods of calculation. At the same time, the regulations discussed authorise the Commission to work out and implement the common organisation of agricultural markets. The Treaty does not provide a definition of a common organisation of agricultural markets, however, it results from its provisions that it is based on the existing national markets. Agricultural markets should possess the means necessary to achieve particular objectives and, specifically, should aim at regulating prices and subsidies for production and placing different products on the market. Another aim was to organise storage and transport systems as well as common mechanisms stabilising import and export. A common price policy should be based on common criteria and uniform methods of calculation.

The aim of a common organisation of agricultural markets was to enhance the impact on agricultural markets by increasing the range of forms and methods of market intervention. Different legal bases, mechanisms of action as well as legal and economic instruments were established for the organisation of individual markets. The legal and economic instruments of influencing agricultural markets included, above all, agricultural prices, limiting the volume of

agricultural production, production quotas, premiums, supplementary payments or intervention buying-in of agricultural products. The most important instruments of internal market protection in trading with third countries included compensation, export subsidies, duties and quotas. Agricultural prices belonged to the most significant financial instruments applied in the EU. These prices were established at a relatively high level (higher than global prices) and were supposed to ensure an appropriate income for producers. Among other financial instruments, intervention buying-in was used to prevent agricultural prices from decreasing below a certain threshold. Other instruments included also limiting agricultural production, which was realised by the system of quotas (quotas system), the system of products withdrawal from the market and excluding agricultural land from farming, etc.

It was indicated that the agricultural market is rather specific. It is not a single market in its nature, but it consists of numerous markets having different characteristics, specific for individual industries. Most agricultural products can be at the same time raw materials, semi-finished or finished products. The market also specifies the character of supply and demand to a large extent and creates the possibility of mutual compensation of needs and shortages in different sectors. Within the framework of agricultural policy, the groups of commodity markets of sectoral character were identified that were subject to various agricultural interventions. On the basis of the intervention criterion, external protection with obligatory intervention, i.e. protection against competition from third countries, can be distinguished with a full price and sale guarantee by way of compulsory purchase at a fixed intervention price. Apart from that, there is also external protection with optional intervention, i.e. price and sale guarantee limited in time and quantity, to a particular volume of purchase (TFEU, 2009).

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

In general, agricultural market, as part of the common European market, was based on the following rules. First of all, a single internal market is associated with free circulation of goods without internal duties and charges. Secondly, preference shall be given to goods produced within the Union in order to increase the cost-effectiveness of purchase. Thirdly, intervention mechanisms shall be harmonized to eliminate any differences in the level and structure of national prices and, fourthly, member states shall jointly contribute to finance the common agricultural policy (TFEU, 2009).

The common organisation of agricultural markets in accordance with the Council Regulations (EC) from 2007

In the explanatory memorandum to the Council Regulation (EC) from 2007, it was stated that in agricultural trading there are a lot of products and entities, which require coordination to achieve organisational order. The regulation was horizontal in nature, which means that it was directed to all participants of the agricultural market, irrespective of the place of their business activity, and to economic sector in order to solve a particular problem. A horizontal approach was relatively new in sectoral provisions concerning agricultural markets. The main objective of the legislation was to simplify a legal framework through the overall coverage of the regulated area related to the organisation of agricultural markets. Circulation in the scope of production, trade and consumption required the application of legal regulations and implementation of market intervention instruments, which were supposed to produce particular market effect. Different countries, depending on the character of agricultural production and the range of goods, applied a diversified market policy to meet different consumption needs of the population. Among numerous factors influencing agricultural markets, the fundamental instruments of support include prices of agricultural products. Prices are of stabilizing character, they are supposed to

counter their seasonal fluctuations and ensure an appropriate income for agricultural producers. The character of the agricultural market results from the specific nature of production process in agriculture, seasonality of demand and supply, agricultural trade, high level of risk, short-term market volatility and limited mobility of production factors (Lipinska, 2008).

The Council Regulation (EC) No 1234 from 2007 established a common organisation of agricultural markets and introduced provisions concerning some agricultural products. In this part, the objective of the Common Agricultural Policy reform was, among others, simplifying the legislation, which regulated all aspects of agricultural trade in too much detail. According to the Council, simplification should not lead to calling into question the decisions concerning the regulations of the Common Agricultural Policy, which had been taken in the past. In order to ensure market stabilisation as well as the appropriate level of life for rural community, a diversified system of price support was developed for individual sectors. Therefore, the Council (EC) indicates that the existing instruments should neither be repealed nor altered. Since the implementation of the Common Agricultural Policy, the Council has introduced 21 common market organisations, directed at the individual product or the group of products, which were regulated by separate basic Council regulations. Most basic regulations had the same structure and numerous provisions in common. It related in particular to the provisions regarding trade with third countries as well as general rules regulating the internal market. Therefore, there was the need to combine the provisions included in different regulations into a single legal framework. This decision constituted the most significant measure within the Common Agricultural Market reform, which allowed for the repeal of almost 50 EU regulations and the reduction of the number of implementing regulations from 650 to 200. Regulations provide

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

for different instruments of support for agricultural producers, including public intervention and private storage, special intervention measures, systems of production limitation, aid schemes, ways of marketing and production as well as trade with third countries. Moreover, previously separate committees were replaced with one Management Committee, which is going to work within individual sectors. Creation of a single common market organisation does not mean changing the policy in individual sectors. It is a change of a technical character

aiming at simplifying legislation, reduction in the number of provisions, obtaining better transparency and facilitating the decision-making processes (Council Regulation, 2007).

The common organisation of agricultural markets was financed by the European Agricultural Guarantee Fund (EAGF). In the years 2007 – 2013, intervention measures on the agricultural market amounted to approximately 26.6 billion euro, that is, 5.8 % of the total spending of the EAGF. The data indicates a clear decrease in export refunds.

Table 1

Breakdown of EAGF expenditure on interventions on the agricultural market (million euro)

| Specification | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|--------------------------|----------|----------|----------|----------|----------|----------|----------|
| Storage | -106.7 | 147.9 | 173.4 | 93.6 | -194.6 | 17.4 | 25.1 |
| Export refunds | 1 444.70 | 925.4 | 649.5 | 385.1 | 179.4 | 146.7 | 62.4 |
| Other market means | 3 427.10 | 3 046.40 | 3 083.50 | 3 454.80 | 3 428.30 | 3 344.50 | 3 217.20 |
| Financial means in total | 4 765.10 | 4 119.70 | 3 906.40 | 3 933.50 | 3 413.10 | 3 508.60 | 3 304.70 |

Source: The Directorate General for Agriculture and Rural Development of the EC

Data analysis by year indicates the reduction of interventions on agricultural markets from 4.7 billion euro in 2007 to 3.3 billion euro in 2013.

New EP and Council (EU) Regulations of the common organisation of agricultural markets from 2013

At present, the system of agricultural markets at the European level is regulated by the EP and Council Regulation (EU) No 1308 from 2013. In the regulation, a horizontal approach was maintained, which applies to all countries and types of agricultural markets. It refers to further consolidation of other regulations in one legal act allowing for a comprehensive look at a significant economic segment of the EU. By means of the regulation, the European Union generates rules concerning the management of agricultural markets, norms of placing agricultural products on the market as well as rules related to export and import from the EU.

The development of the common organisation of agricultural markets has been subject to a constant improvement and adjustment to a

changing economic situation for many years. In fact, the organisation includes 28 national markets, which provide specific products for different regions. The main objective is to support producers as well as distribution and agri-food processing. By means of the organisational system of agricultural markets, the policy of intervention in the EU is being developed to support producers and the related industry (Regulation, 2013).

The Regulation reregulates the issues covered by the previous regulation from 2007 and divides them into six parts including, among others, the internal market and interventions on the market, rules concerning placing products on the market and organisation of producers, trade with third countries like import and export certification, import duties, management of tariff quotas, export refunds as well as competition principles. The introduced rules cover also general provisions related to emergency measures like, in particular, preventing market disturbances attributed to price fluctuations or other events

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

(failures). In addition, support measures were granted for such situations as animal diseases or a loss in consumer confidence due to public or plant health risks as well as other measures, related to common interventions in the period of serious market imbalances, and new reserve for crises in the agricultural sector (Regulation, 2013).

The reserve constitutes a new instrument aiming at supporting the sector in the case of a production or distribution crisis. It is created annually by reducing direct payments within the mechanism of financial discipline. Financial discipline applies only to direct payments exceeding 2 thousand euro. Every year, unused resources from the reserve are returned to farmers. For the years 2014 – 2020, the reserve has been divided into seven equal annual tranches 400 million euro each (2.8 billion euro). This crisis reserve can be used to finance emergency measures preventing market disturbances.

Moreover, the system of public intervention as well as the private storage aid have been subject to review in order to improve their functionality and effectiveness. Detailed rules have been introduced concerning interventions on individual markets. The provisions related to 'Fruit and vegetables at school' or the programme 'Milk at school' remained in force. New programmes include support for apiculture co-financed in 50 % by the EU. Furthermore, the regulations concerning producer organisations, associations of producer organisations and inter-branch organisations have been extended to cover all sectors in order to improve the negotiation powers of farmers. They are financed from the funds for the development of rural areas. Apart from that, sectoral producer organisations can, under certain conditions, participate in collective negotiations on behalf of their members. In some cases, the Commission can authorise the recognised producer organisations, their associations or the recognised inter-branch

organisations to take certain provisional measures (e.g. withdrawal from the market or storage by private operators) to stabilize markets. In addition, a range of less important and unused programmes have been abolished (aid for the use of skimmed milk and skimmed-milk powder in animal feed and casein, support related to silkworm production) (Regulation, 2013).

The new regulation maintains export refunds to third countries but only for specific products and only in the case when the conditions on the internal market conform to the conditions required to apply emergency measures. Subsidised exports are to be limited.

The issues related to financing the common organisation of agricultural markets are covered by the first pillar of the Common Agricultural Policy but, unlike direct payments and amounts allocated for the development of rural areas, the amounts earmarked for markets support are not allocated in advance for the period 2014 – 2020. Annual financial needs are covered by the draft budget for a given financial year. In 2014, expenses on markets support amounted to 2.48 billion euro, most of which was earmarked for the fruit and vegetables and wine sector as well as for the aid for the outermost regions (the so called POSEI). In the budget for 2015, the European Commission assigned the revenue, initially estimated at the amount of 1 768.6 million euro, to fruit and vegetables – 469.3 million euro, milk and dairy products – 54.3 million euro as well as to the decoupled direct aid – 1 245 million euro (Report, 2016).

The common organisation of agricultural markets embraces such sectors and fields as market in cereals, rice, dried fodder, seeds, hops, olive oil and table olives, flax and hemp, fruit and vegetables, processed fruit and vegetable products, bananas, wine, live plants and floriculture products, tobacco, beef and veal, milk and dairy products, pork, sheep meat and goat meat, eggs, poultry meat, ethyl alcohol of

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

agricultural origin, apiculture products and other (Regulation, 2013).

Selected regulatory mechanisms related to the organisation of agricultural markets

In the Regulation from 2013, different mechanisms and financial instruments were indicated that have the influence on the organisation of agricultural markets. An important factor for the functioning of sectoral agricultural markets is public intervention. The mechanism of public intervention is used only in relation to selected agricultural products in accordance with the established conditions and all additional requirements. Moreover, public intervention has been determined for a limited time, depending on the product character. Procedures of access to public intervention were also specified, including the entity, which can manage such an intervention. Public intervention takes place at the intervention price that determines the purchase price of products within this procedure. The mechanism of intervention buying-in shall be maintained in relation to butter and skimmed-milk powder together with the extended buying-in period. Within the framework of the reform, the mechanism of intervention buying-in has been maintained for common wheat, durum wheat, barley, maize and rice. A similar mechanism relates to beef and veal with the change of the way of its implementation.

An important element of building the internal market is the instrument of aid for private storage of agricultural products. Private storage of products by farmers is more economical than building special warehouses by the state. Similarly as in the previous cases, private storage aid can be earmarked exclusively for the selected products. It is required that products bought in under public intervention or subject to aid for private storage, are suitable for long-term storage and have fair marketable quality. The Commission is empowered to adopt delegated acts specifying requirements and conditions that

must be met by these products. The programmes 'Fruit and vegetables at school' as well as 'Milk at school' have been indicated among the programmes providing access to food. These programmes aim to promote healthy eating habits among children and ensure that children from the particular target group make use of the aid. Moreover, the programmes are supposed to improve the distribution of agricultural products.

The new regulation acknowledges the importance that the EU attaches to particular structures of agricultural producer organisations and inter-branch organisations. Producer organisations are supposed to enhance their position in the food chain and to improve their functioning. The distinction of these organisations between producer and inter-branch ones depends on the given market and its specificity. Organisations have to act for concentration of supply, optimisation of production costs, placing on the market, integration and improvement of effectiveness. For instance, producer organisations are directed mainly at the fruit and vegetables sector, whereas inter-branch organisations at the tobacco sector (Russo, 2014).

A very significant element of agricultural market reform is the development of crisis management measures. The available instruments will include measures for all sectors and, in particular, mechanisms preventing market disturbances as well as mechanisms related to the effects of animal diseases eradication or the loss in consumer confidence. The previous provisions in this scope had been scattered and related only to the selected sectors.

Another instrument of the reform is the mechanism of export refunds and specification of the aid's level. Refunds shall be implemented as the crisis management measure, preventing market disturbances or excessive increase in agricultural production.

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

Information and promotion activities

In accordance with the Regulation of the European Parliament and the Council from 2014, the objective of information and promotion activities is to strengthen the competitiveness of the agricultural sector in the Union as well as to improve the competitive balance both on the internal market and in third countries. In particular, information and promotion activities aim at raising consumers' awareness about the advantages of the Union agricultural products and production methods. Moreover, the goal of information measures is to increase the knowledge about the EU quality schemes and their better recognisability. In fact, these actions should enhance competitiveness, consumption and visibility of the EU agricultural products both in the Union and outside it. In the case of serious disturbances on the market, a loss in consumer confidence or other specific problems, these measures should help restore normal market conditions. Information and promotion activities should be constantly implemented to achieve the objectives. Information measures should highlight the authenticity of agricultural products, emphasizing their advantages as original products in comparison with counterfeit products. In addition, the objective of the promotion is to increase the knowledge about symbols, indications and abbreviations identifying participation in the European quality schemes laid down in the EP and Council Regulation from 2014 (Regulation, 2014).

It is indicated in the regulation that information and promotion activities shall not be directed at the specific trademark. The possibility of providing information about the trademark and the product's origin should be allowed to improve the quality and effectiveness of presentation, consumption as well as information and promotion materials. Moreover, the activities should be consistent with the general principles of EU law and should not restrict free movement

of agricultural and food products within the EU (Regulation, 2014).

Conclusions

The Council Regulation (EU) from 2007 on the common organisation of agricultural markets initiated the process of agricultural markets consolidation, which laid the foundations not only for producers support but also for the whole agri-food processing industry. New rules had been adopted that related particularly to interventions on markets, systems of quotas and aid, standards for placing on the market and production as well as trade with third countries. The common organisation of agricultural markets set out a legal framework at the European level in relation to all agricultural sectors. In this way, the European Union aimed at establishing common rules concerning agricultural markets management as well as norms for agricultural products placed on the market and related to import and export from the European Union. The introduced legal instruments in the scope of market policy implementation concerned three groups of problems. The first group aimed at supporting pricing policy and, in certain cases, at limiting the production of specific crops. The second one related to financial instruments, such as minimum prices, intervention prices, intervention buying-in, quotas and compensation payments in the events of reduced price support. The third group was associated with the increase in the cost-effectiveness of export from the Union on account of the possible higher prices on the internal market compared to global markets. It was necessary, therefore, to implement export refunds, which reduced the influx of competitive products from outside the member states.

The new EP and Council Regulation from 2013 constitutes the continuation of directions of changes adopted in 2007. At the same time, it is part of the Common Agricultural Policy reforms to be implemented until 2020 that address the challenges of the future related to food, development of production potential and

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

maintaining competitiveness of the Union's agricultural sector in the light of increasing globalisation. Moreover, the horizontal approach to market regulation was maintained that leads to further moving away from the sectoral approach. The regulation integrates previously delegated provisions in one act which allowed for taking the comprehensive look at the way of conducting market policy. The agricultural market has been extended to include three new sectors,

that is, the markets of apiculture products, silkworm rearing as well as ethyl alcohol of agricultural origin. A comprehensive look at agricultural markets in the European scale is not always reflected in all member states. The lack of regulations in the EU legislation results in the fact that the decisions take the form of self-execution, not always consistent with European decisions.

Bibliography

1. Lipinska I. (2008). New regulation on the common organisation of agricultural market, *Agricultural Law Review* No 1.
2. Mickiewicz B., Mickiewicz A. (2014). Estimation of process and realization of activities introduced into axis 'Improvement of natural environment and rural areas of RADP 2007-2013'. *Scientific Journals of the Warsaw University of Life Sciences PROBLEMS OF WORLD AGRICULTURE*, Volume 14 (XXIX), Issue 2.
3. Regulation (EU) No 1144/2014 of the European Parliament and of the Council of 22 October 2014 on information provision and promotion measures concerning agricultural products implemented in the internal market and in third countries and repealing Council Regulation (EC) No 3/2008.
4. Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007.
5. Council Regulation (EC) No 1234/2007 of 22 October 2007 establishing a common organisation of agricultural markets and on specific provisions for certain agricultural products (Single CMO Regulation).
6. Russo L., 2014, CAP Reform of 2013 and contractual relationships among market participants, *Agricultural Law Review* No 2 (15).
7. Report from the Commission to the European Parliament and the Council on EAGF expenditure, Early warning system No 11-12/2015, Brussels.

¹ Bartosz Mickiewicz. Tel.: +48 9144 96980; fax: +48 9144 96980. E-mail address: Bartosz.Mickiewicz@zut.edu.pl

² Irina Pilvere. Tel.: +37129217851; E-mail address: Irina.Pilvere@llu.lv

ECO-MANAGEMENT AND AUDIT SCHEME (EMAS) AS AN IMPORTANT ELEMENT OF THE SUSTAINABLE DEVELOPMENT POLICY ON THE EXAMPLE OF POLAND

Janusz Myszczyzyn¹, PhD

¹ West Pomeranian University of Technology, Faculty of Economics

Abstract. The idea of sustainable development is a major challenge of the modern world. Therefore, the need to protect natural resources in accordance with the idea of sustainable development is an indisputable issue. The Eco-Management and Audit Scheme (EMAS) can play an important role in this respect. 3.7 thousand organizations have already registered in the EU EMAS register, including, unfortunately, only 72 from Poland, of which almost 40 % from the public sector and 60 % from private sector. The author tries to set out the benefits, resulting for the public and private sector organizations from the implementation of the scheme, but also the barriers and weaknesses of the system, which makes it not very popular in Poland. The results of the author's research carried out in 2016 (May-December) among representatives of EMAS system in Poland were used for this purpose.

Key words: Eco-Management and Audit Scheme (EMAS), sustainable development, management system, environmental protection.

JEL code: Q56

Introduction

The balance between the economic growth and the need to protect the environment and preserve not-renewable natural resources for future generations has become an important element of contemporary economic policies. Besides the ecologic aspects of economic activities, social and societal effects increasingly receive more attention. EMAS-verified organizations have an excellent foundation for such enhancements - including the expansion from an environmental to a comprehensive sustainability management (Good reasons for EMAS, 2011).

The Treaty of the European Communities, in Article 3 set out: The Union shall establish an internal market. It shall work for the sustainable development of Europe, based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the environment quality. It shall promote scientific and technological progress (Treaty, 2012).

EMAS registered organizations play an important role in the future in the propagation of EMAS system in Poland and EMAS system has a chance to exert an important impact on promoting the sustainable development aspects.

While preparing the article, the author assumed the following objectives:

- to analyse the statistics on the implementation of the EMAS system in public and private sectors' organizations;
- to reveal that public sector entities can also have a significant influence on the environment and on private sector organizations and promote sustainable development;
- to indicate the impact of environmental systems on a continuous increase in the awareness of sustainable development in Poland;
- to present major benefits and barriers that accompany the implementation of EMAS in Poland.

To review the research hypothesis posed and research objectives, the author used the following resources.

a) Primary materials - results of the author's research conducted amongst EMAS registered organizations in Poland. The questionnaire survey was conducted between May and December 2016.

The author has divided 72 organizations registered in Poland into two groups: public sector and private sector organizations. The questionnaire designed and drawn up by the author was sent to the representatives of the EMAS environmental management system, identified in the environmental statements. The questionnaire included 14 questions on EMAS,

including 4 open-ended questions, 10 closed questions (3 alternative questions, 3 disjunctive questions, 4 conjunctive questions), 4 semi-open questions included.

32 organizations, including 19 belonging to the public sector and 13 private sector ones agreed to participate in the study.

b) Secondary materials, which include: the statistics available under the Community EMAS register, the register kept by the General Directorate for Environmental Protection, Environmental declarations of EMAS registered organizations and sites, literature on the subject matter.

Research results and discussion

The European Commission enacted the so-called EC Eco-Audit Regulation in 1993 with focus on the manufacturing industry. Thus, EMAS the first European certifiable environmental management scheme - was born. In 2001, EMAS was revised to integrate ISO 14001 and to allow participation by all economic sectors. The focal point of the revision in 2010 was administrative relief for small and medium-sized enterprises. Furthermore, the revision made it possible for sites outside the EU to participate (Good reasons for EMAS, 2011, Myszczyzyn, 2010).

With regard to the ISO 14001 environmental management system, EMAS adds four elements:

- constant improvement of pro-environmental action by the necessity to renew the registration, to update the environmental statement and a continuous setting out of new environmental objectives;
- compliance with the legislation on the environmental protection guaranteed by the participation of government authorities in the system;
- universal access of public opinion through open publications of environmental statements, environmental reports;
- involvement of organizations' employees and management (Myszczyzyn, 2010).

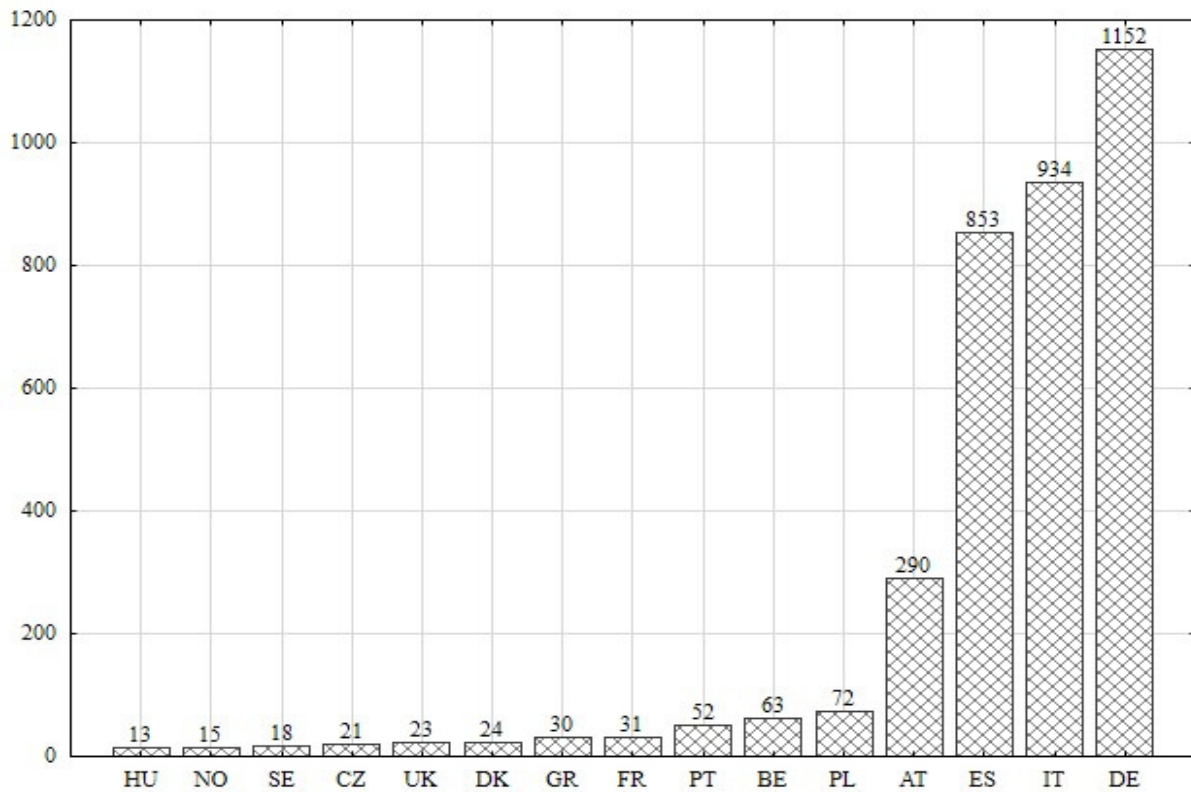
Actually, the participation in EMAS scheme is free and open to all kinds of organizations. It is assumed that EMAS shall be made available to all organizations, in and outside the Community, whose activities have an impact on the environment. EMAS shall provide these organizations with the measures to manage that impact and to improve their overall environmental performance (Regulation (EC) No 1221/2009).

Organizations, intending to be EMAS registered, among other things, must conduct an environmental review, implement an effective environmental management system, carry out an internal environmental audit, prepare an environmental statement, describing both the environmental management system and the environmental performance results (Act of 15 July 2011, Regulation of the Minister of the Environment of 1 February 2012, Regulation of the Minister of Environment of 23 March 2012).

As of 13th October 2016, the EU EMAS register included 3,701 registered organizations, of which 11,230 sites. In Poland, the system registered 72 organizations and 358 sites. It is only 1.8 organizations per 1 million residents (Sustainable, 2015). This constitutes a well visible improvement compared to the 17 organizations registered by the end of April 2009, but still, there is an enormous gap between us and Germany, Italy, Spain (Myszczyzyn, 2010) (Fig. 1).

A list of organizations, operating in Poland and tested by the author and those EMAS registered by sections of national economy is shown below (Fig. 2).

The following sections are most strongly represented in EMAS: section E organizations prevail (remediation and other services related to waste management - 21 organizations), together with those of section O (public administration and defence, compulsory social security - 19 organizations) and section C of industrial manufacturing -15 organizations).



Source: Author's calculations based on data www.emas.gov.pl (30.12.2016)

Fig. 1. The number of registered organizations in the EMAS system in selected countries (01.12.2016.r.)

No organizations of the following sections have been registered: A - agriculture, shooting and forestry, G- wholesale trade, except for motor vehicles, P - education.

The organizations tested by the author represented sections: O (14 organizations), E (7 organizations), C (5 organizations), D (3 organizations), K (1 organization), H (1 organization), Q (1 organization).

The author has conducted his own survey of 19 public sector organizations, listing the main environmental objectives laid down in the environmental statements of the public sector organizations, which, among other things, emphasized the environmental mission. This mission is particularly important in view of promoting practices in the field of sustainable public procurement, encouraging to create and promote effective public and public-private partnership as well as involving civil society built

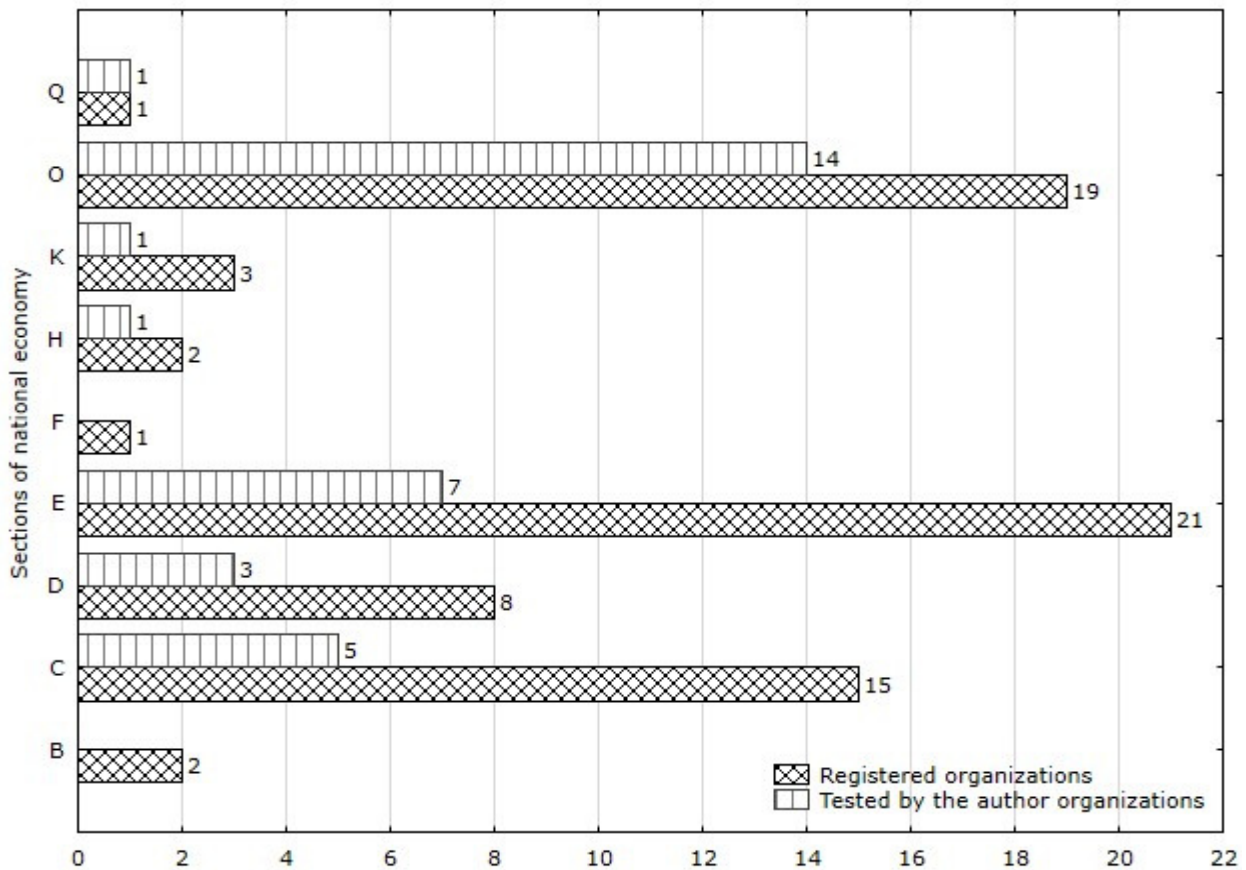
on experience and sourcing strategies in partnership (Rezolucja, 2015).

The author has conducted his survey of 19 public sector organizations, listing the main environmental objectives laid down in the environmental statements of the public sector organizations, which, among other things, emphasized the environmental mission.

This mission is particularly important in view of promoting practices in the field of sustainable public procurement, encouraging to create and promote effective public and public-private partnership, as well as, that involving civil society, built on experience and sourcing strategies in partnership (Rezolucja, 2015).

Public sector organizations registered in EMAS and under the author's survey focused, among other things, on:

- rational use of water resources, water and wastewater management included;



Source: Author's calculations based on data www.emas.gov.pl (15.11.2016)

Fig. 2. Organizations registered and tested by author in the EMAS in Poland by sections of national economy (31.12.2016 r.)

- air protection, noise reduction;
- working place environment protection;
- ensuring effective and stable protection of reserves and monuments of nature;
- prevention of hazards to the environment, resulting from the activities of the environment users;
- exerting influence on society, with reference to the need to protect endangered species of animals and plants;
- shaping appropriate approach of employees aimed at reducing the consumption of electricity, water, paper;
- ensuring access to the environmental information to the public;
- continuous improvement of environmental performance contained in environmental statements (Myszczyzyn 2017).

An important goal is an active participation of employees in the implementation of specific tasks related to environmental protection. This is

manifested through participation in training, certification, preparation of environmental statements, the current functioning of the company as well as improved working conditions (e.g. by reducing hazardous factors such as noise).

The respondents, public sector organizations indicated the following main benefits of the introduction of EMAS:

- increased awareness of the need for action in the field of environmental protection (15 replies);
- continuous improvement, and by the same, an impact on the sustainable development of the country and the world (14 replies);
- other: increased awareness of employees on the impact they may have on the environment, minimizing consumption of resources, among other things, of paper (printing, copying), water, electricity and heat etc., the impact on other organizations,

including suppliers and customers (applicants included). EMAS scheme representatives, responding to the questionnaire could not see direct economic and financial benefits, arising from the introduction of EMAS, improvement in employees working conditions, increased competitiveness.

The private sector in Poland is represented largely by the company of three sections: C (Manufacturing), D (Electricity, gas, steam and air conditioning supply) and E (Water supply; sewerage, waste management and remediation activities) (nearly 90 % of implementations).

The respondents of private sector organizations (13 organizations) indicated the following main benefits of the introduction of EMAS:

- increased awareness of the need for action in the field of environmental protection (12 replies);
- continuous improvement, and by the same, an impact on the sustainable development of the country and the world (12 replies);
- improving the image and relations with stakeholders (12 replies);
- economic and financial benefits, impact on the network of suppliers and customers, more competitive organization.

The following financial benefits were underlined, among other things:

- exemption from excise duty (coal);
- reduced waste and costs associated with its management and disposal;
- reduced quantity of raw materials consumed when using new, more efficient and more environment-friendly technologies;
- reduced pollution (greenhouse gas and dust emission along with dirty water discharge), which led to an increase in economic efficiency, but often required capital expenditures being incurred;
- lack or reduced fines paid for environmental pollution; prestige in the external environment, better (ecological) product;

- better living conditions ensured to those around, including the local community in the region.

Respondents indicated that despite measurable benefits, EMAS scheme also has weaknesses which include:

- the necessity to set out, document and verify subsequent environmental objectives, which means extra costs and, in the case of large environmental goals, it may be difficult to put them into life;
- the need to develop regular environmental reports, which require the involvement of staff and management, and which may interfere with the on-going activities of the organization;
- laying down of further environmental goals, which in the case of public sector organizations, in the absence of a comprehensive pro-ecological policy of the state, can become a challenge;
- no measurable effects in terms, if only, of limiting additional inspections related to environmental protection on behalf of state authorities;
- no amenities with respect to grants for direct investments into environmental protection;
- no tax relief nor other benefits, e.g. in tender procedures, applications for EU funds;
- poor promotion of the EMAS logo in Poland, in many cases unknown by other organizations and citizens.

The private sector respondents pointed out that competing companies can easily get access to business information, which they claimed to be a threat.

When asked about the main reasons for the implementation of EMAS in their organizations (public and private sectors), the respondents indicated:

- that it was necessary to have continuous improvement of their environmental performance, the achievement of the next

stage in this sphere included, as they had introduced ISO 14001 system earlier;

- increased prestige of the organization, the promotion of environmental protection in the external environment included;
- increased involvement of employees in achieving environmental objectives;
- promotion of the idea of green management office;
- instruction of the superior authority.

The above analysis taken into account, the author positively concludes that the implementation of environmental management systems, EMAS included, increases the awareness of organizations, institutions, their management and employees as well as society that the care about environment is needed to contribute to the promotion and implementation of the idea of sustainable development (Myszczyzyn 2009). In addition, in their construction, environmental management systems use the achievements in the field of quality management, manifested, if only, in the continuous improvement of the system.

As suggested by numerous authors, the implementation of EMAS has an impact on the external and internal benefits gained, on suppliers, customers included (Strachan, Haque, McCulloch, Moxen 1997; Hillary 2004; White, Lomax 2010; White, Lomax, Parry 2014). However, the costs of investments in the area of environment may sometimes exceed the short term revenues, but the long term financial benefits, the environmental ones included can be significant. Well-spread use of respective tools to evaluate environmental aspects within the idea of sustained development is equally important (see: Gecevska, Donev, Polenakovik, 2016).

Conclusions, proposals, recommendations

1) with a person in implementation of one's business activities, keeps interfering with natural environment and makes up a permanent threat for plants, animals and

microorganisms, surrounding him/her along with the atmosphere. By the same, this person worsens one's own life environment. As a consequence of the above, the implementation of the EMAS (Eco-Management and Audit Scheme) is a chance to put into life the sustainable development guidelines. This can also be a chance to the organizations which already have ISO 14001 environment management system, to improve their further environmental actions within EMAS.

- 2) As shown by the study, in the opinion of the majority of respondents, regardless of the sector, the EMAS system rather has not contributed directly to an increase in the competitiveness of the organization. However, the need to set new environmental objectives and to improve the system, the drawing up further environmental statements had an indirect influence on the increase in innovativeness and contributed to confidence in the environs of the organization, to the involvement of employees, the boards included. EMAS has a largely indirect influence and increases the environmental innovation potential of the facility.
- 3) The assumptions of the EMAS scheme of continuous improvement and verification of targets along with laying down new ones make up difficulties to the organizations already registered and a barrier to potentially interested new candidates.
- 4) Viewed from the perspective of a few years back, the involvement and participation in the system of key organizations responsible for the generation and implementation of environment protection policy such as the Ministry of Environment and Regional Directorates of Environment Protection shall be evaluated positively.
- 5) The involvement of public entities is a signal to other organizations to try to make their employees and society aware that each of

them independently of the ownership form and character of business can have an impact on the pro-ecological behaviour. The engagement of public organizations allows to believe that in the future they may involve a greater participation of SMEs, farmers and food economy environment. Although the number of EMAS implementations has been growing, the agricultural sector in Poland is still without a representative. Unfortunately, as Dacko indicates, this sector for the time

being resists most effectively the tendencies to implement any environmental management system, the EMAS included (Dacko, 2013).

- 6) The issue of society education remains still a sine qua non matter, which needs drawing up a respective syllabus, preparation of mass media, the Internet, and an active participation of schools, universities and public organizations so as to promote pro-ecological conduct.

Bibliography

Journal paper with author(s)

1. Dacko, M.(2013). Charakterystyka systemow zarzadzania srodowiskowego i ocena potencjalnych korzysci ich wdrozenia w gospodarstwach rolnych, (Characteristics of Environmental Management Systems and Evaluation of Potential Benefits of Their Implementation in Agricultural Holdings), Roczniki Naukowe Stowarzyszenia Ekonomistow Rolnictwa i Agrobiznesu, T. 15, pp. 48-54.
2. Gecevska, V., Donev, V., Polenakovik, R. (2016). A Review of Environmental Tools towards Sustainable Development, Annals of Faculty Engineering Hunedoara – International Journal of Engineering, Tome XIV, 1 Fascicule [February].
3. Good reasons for EMAS, 2011 Retrieved: http://www.emas.de/fileadmin/user_upload/06_service/PDF-Dateien/7-good-reasons-for-EMAS.pdf. Access: 28.12.2016
4. Hillary, R. (2004). Environmental Management Systems and the Smaller Enterprise. Journal of Cleaner Production, 12.
5. Myszczyzyn, J. (2009). Rola wspolnotowego systemu ekozarzadzania i audytu (EMAS) w promowaniu zrownowazonego rozwoju w Polsce (The role of the eco-management and audit scheme (EMAS) in the promotion of sustainable development in Poland), Acta Scientiarum Polonorum (Oeconomia) 8 (4), pp. 127-138.
6. Myszczyzyn, J. (2010). Polskie doswiadczenia w implementacji wspolnotowego systemu ekozarzadzania i audytu w swietle najnowszego rozporzadzenia EMAS III (Polish experience with the implementation of community Eco-management and audit scheme in the face of the latest regulation EMAS III), Ochrona Srodowiska i Zasobow Naturalnych nr 44, pp. 44-50.
7. Myszczyzyn, J. (2010). Proba oceny korzysci i barier związanych z implementacją Wspolnotowego Systemu Ekozarzadzania i Audytu (EMAS) (Attempt to assess the advantages and barriers in the implementation of example of sustainable development in the community eco-management and audit scheme (EMAS), Folia Pomeranae Universitatis Technologiae Stetinensis, Oeconomica 277 (58).
8. Myszczyzyn J. (2017). Eco-management and Audit Scheme (EMAS) as an Important Element of the Sustainable Development Policy on the Example of Public sector Organizations, Ochrona Srodowiska i Zasobow Naturalnych, vol. 28 No 1(71)/2017
9. Strachan P., Haque M., McCulloch A., Moxen J. (1997). The Eco-Management and Audit Scheme: Recent experiences of UK participating organizations, European Environment, Vol. 7.
10. Sustainable Development in the European Union. (2015) Monitoring Report of the EU Sustainable Development Strategy, Eurostat, Luxembourg: Publications Office of the European Union.
11. White, G., Lomax, M. (2010). Environmental Management Systems: Costs, Benefits and an Activity Theory Approach to Understanding their Knowledge-generating Capabilities, The Environmentalist, 100.
12. White, G., Lomax, M. Parry, G. (2014). The Implementation of an Environmental Management System in the Not-for-profit sector, An International Journal, 21 (4).

Legislative acts

13. Rezolucja przyjeta przez Zgromadzenie Ogolne w dniu 25 wrzesnia 2015 r., 70/1. Przeksztalcamy nasz swiat: Agenda na rzecz zrownowazonego rozwoju 2030 (Resolution adopted by the General Assembly on 25 September 2015 Transforming our world: the 2030 Agenda for Sustainable Development), United Nations A/Res/70/1 21 October 2015.
14. Rozporzadzenie Ministra Srodowiska z dnia 1 lutego 2012 r. w sprawie wzoru wniosku o rejestracje organizacji w rejestrze EMAS (Regulation of the Minister of the Environment of 1 February 2012 on the model of the application for registration of organizations in the EMAS register), Dz.U. 2012 nr 0 poz. 166.
15. Rozporzadzenie Ministra Srodowiska z dnia 23 marca 2012 r. w sprawie wspolczynnikow roznicujacych wysokosc opłaty rejestracyjnej za wpis do rejestru organizacji zarejestrowanych w krajowym systemie ekozarzadzania i audytu (EMAS) (Regulation of the Minister of Environment of 23 March 2012 on the factors differentiating the registration fee for the entry in the register of organizations registered in the national eco-management and audit scheme (EMAS)) (Dz.U. 2012 nr 0 poz. 341).

16. Rozporządzenie Parlamentu Europejskiego i Rady (We) Nr 1221/2009 z dnia 25 listopada 2009 r. w sprawie dobrowolnego udziału organizacji w systemie ekozarządzania i audytu we Wspólnocie (EMAS) (Regulation (EC) No 1221/2009 of The European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC).
17. Traktat o Unii Europejskiej (wersja skonsolidowana) (Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union 2012/C 326/01) (Dz.U. C 326 z 26.10.2012)
18. Ustawa z dnia 15 lipca 2011 r. o krajowym systemie ekozarządzania i audytu (EMAS), (The Act of July 15, 2011 on the National Community Eco-Management and Audit Scheme (EMAS)), Dz.U. 2011 nr 178 poz. 1060

ROLE OF SUPPORT PAYMENTS IN THE DEVELOPMENT OF TERRITORIES IN LATVIA

Aleksejs Nipers¹, Dr.oec.; Irina Pilvere², Dr.oec., Zane Bulderberga³, Dr.oec.

^{1, 2, 3} Faculty of Economics and Social Development, Latvia University of Agriculture

Abstract. Territorial competitiveness and sustainable development may be assessed in a number of dimensions, and they are affected by various factors. Regional economies are complex, dynamic systems arising from the interactions of housing, labour, business and other market systems with characteristics of a place, all enabled and shaped by the government and civic-sector activity. Agriculture continues to have an important influence on the economy of most rural regions, and agriculture continues to be the main land use in rural regions. For these reasons, support payments play a large role in the development of rural territories in Latvia, particularly after the accession to the European Union (EU) in 2004. The **research aim** is to identify the role of support payments in the development of municipalities in Latvia. To achieve the aim, the following specific research tasks were set: 1) to analyse the amounts of support payments received by municipalities of Latvia; 2) to assess associations between the amounts of support payments and other socio-economic indicators for municipalities of Latvia. The present research found that support payments played an essential role in the development of territories in Latvia, as Latvia received EUR 4.610 billion through various support payment schemes in the period 2002-2015, and its municipalities attracted 90 % of the total or EUR 4.126 billion. The EU Common Agricultural Policy (CAP) area-based payments represented the most significant amount of support payments for municipalities, and most of the payments were received by the municipalities having a large agricultural area and a small population. In the period 2009-2013, the funding of European Agricultural Fund for Rural Development (EAFRD) and European Fisheries Fund (EFF) projects received by municipalities of Latvia amounted to, on average, EUR 2501 per capita, and there were strong associations between the amounts of support funding per capita and the size of subsidies from the Local Government Equalisation Fund, the managed utilised agricultural area (UAA) and the turnover of enterprises engaged in primary production.

Key words: support payments, municipalities, development, indicators.

JEL code: O11, O18

Introduction

The urgency of the problem is related to the necessity to promote the sustainable development of rural territories. The idea of territorial development in relation to other decentralised and local development approaches was established in the latter part of the 20th century (Quan J., Nelson V., 2005). The diverse aspects of it have been extensively researched both by international organisations and by scientific institutes and universities (Kuznets S., 1971; Partridge J., Nolan J., 2005; Boisier S., 2005; Quan J., Nelson V., 2005; OECD, 2006; Partridge M.D., Clark J., 2008; Farrugia N., Gallina A., 2008; Duhr S., Colomb C., Nadin V., 2010; Bellu L.G., 2011; INTERCO, 2012; Vesperis V., 2012; Hermansons Z., 2012; Kawka R., 2013; Lonska J., 2014; et al.). Regional economies are complex, dynamic systems arising from the interactions of housing, labour, business and other market systems with characteristics of

a place, all enabled and shaped by the government and civic-sector activity.

The relationship between urban and rural areas is changing in countries all over the world. While some of the issues, like changing agricultural systems, are universal, other aspects of the process are specific to certain countries or regions. Public policies and urban and regional plans can help to support economic growth while protecting natural and agricultural land uses (Mylott E., 2009). The OECD (2006) stresses that increasing globalisation, improved communications and reduced transportation costs are additional drivers of economic change in rural areas. The theory and practice of regional policy have recognised that financial redistribution and agriculture-based policies are not able to harness the potential of these economic engines. Promoting integrated rural development poses numerous policy and governance challenges. Nonetheless, agriculture continues to have an important influence on the economy of most rural

regions, and agriculture continues to be the main land use in rural regions. Moreover, a strongly subsidised agriculture can exacerbate the difficulties of rural regions to adapt and diversify into different activities. In Latvia too, particularly after the accession to the EU in 2004, the role of financial support increased, and it was an important factor in the development of rural territories.

The **research aim** is to identify the role of support payments in the development of municipalities in Latvia. To achieve the aim, the following specific **research tasks** were set: 1) to analyse the amounts of support payments received by Latvia's municipalities; 2) to assess associations between the amounts of support payments and other socio-economic indicators for municipalities of Latvia.

The research put forward a **hypothesis** – support payments are essential for the development of territories in Latvia. **The research object** – support payments for municipalities.

Research materials and methods. The present research analysed the amounts of support payments disbursed by the Rural Support Service (RSS), which is responsible for the administration of the EU's CAP and Common Fisheries Policy support payments, that are funded by the European Agricultural Guarantee Fund (EAGF), the EAFRD and the EFF. The amount of support payments disbursed by the RSS is an essential source of finance for a municipality, which can promote the overall development of the municipality.

The support payments administered by the RSS include national subsidies, financial assistance for biofuel production, funds for unforeseen events and other EU payments for farmers, forest owners, rural territories and fisheries, including national co-funding. The EU payments are divided into two groups according to their purpose:

- payments for project-type activities, e.g. support activities for fisheries (EFF), activities under the SAPARD programme, activities for sugar industry restructuring, payments for projects funded by the Structural Funds and the EAFRD for rural development;
- area payments, including those under the Single Area Payment Scheme, additional national direct payments (ANDP) and transitional period national support (TRNS) payments and other payments from the EAGF.

The research employed the administrative division of the territory of Latvia that existed at the beginning of 2015 – 9 cities of national significance (with more than 25000 residents) and 110 municipalities (Administrative teritoriju..., 2008). The present research analysed 110 municipalities. The territory of a municipality is geographically united and has rural territories and populated areas therein; the municipality's local government ensures the fulfilment of the functions prescribed by the law; there are at least 4000 permanent residents in the territory of the municipality; there is a village, or a town, in the territory of a municipality, in which there are more than 2000 permanent residents; the distance from any populated area in the municipality to the administrative centre of the municipality does not exceed 50 kilometres, and the road infrastructure is suitable for accessing the administrative centre of the municipality; the municipality's territory is optimally established, taking into account the interests of neighbouring local governments and historical links. Accordingly, the development of municipalities as a territory is important for the balanced development of the entire country.

The research analysed the development of municipalities by employing the following quantitative indicators:

- population in 2014 (CSB, 2016a);
- change in the population, % – change in the number of residents in the period 2004-2014, (CSB, 2016a);

- personal income tax (PIT) revenue, paid into the local government budget, per capita in 2013, EUR (SRDA, 2016);
- change in PIT revenue per capita in the municipality, % – PIT revenue change in the period 2004-2013, (SRDA, 2016);
- distance to Riga, km (Riga..., 2016);
- average monthly wage and salary in 2014, EUR (CSB, 2016b);
- foreign investment per capita in the period 2009-2013, EUR (SRDA, 2016);
- funding of the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund (CF) absorbed in the period 2009-2013, EUR (SRDA, 2016);
- funding from the Local Government Equalisation Fund in the period 2004-2013, EUR (SRDA, 2016);
- total UAA in the municipality in 2013, ha (SLS, 2014);
- managed UAA in the municipality in 2013, ha (LLU, 2014);
- average land quality in the municipality, points (in 2013) (SLS, 2014);
- funding from the EAGF, the EAFRD and the EFF absorbed in the period 2009-2013, EUR (RSS, 2016a, 2016b, 2016c);
- forest area in the municipality per capita in 2013, ha (LLU, 2014);
- characteristics of strategic enterprises in the municipality (Lursoft, 2016):
 - total turnover of enterprises per capita in 2014, EUR;
 - turnover of primary production enterprises per capita in 2014, EUR;
 - turnover of secondary production enterprises per capita in 2014, EUR;
 - turnover of services sector enterprises per capita in 2014, EUR.
- total amount of support payments disbursed by the Rural Support Service in the period 2002-2015, EUR (RSS, 2016d).

- total amount of area payments disbursed in the period 2002-2015, EUR (RSS, 2016d).

To exclude the effect made by the size of the population, the indicators were calculated per capita. The data were acquired from the databases of the Central Statistical Bureau (CSB), the RSS, the State Land Service (SLS) and the database raim.gov.lv maintained by the Ministry of Environmental Protection and Regional Development.

The George Washington Institute (2011) stresses that from a micro-economic point of view, increasing outputs inherently flow from business-sector growth – increasing the number, size and productivity of firms in the region. Business-sector growth, in turn, occurs through firm creation, growth, retention and attraction. Firms grow and choose to locate where they can be most efficient (including with regard to costs of production, such as transportation) and productive – and so profitable. Therefore, Lursoft data on top 20 enterprises in terms of turnover, which were grouped into three categories, were used for business characteristics. The primary sector is comprised of agriculture, hunting, forestry, fisheries and mining. The present research classifies the primary sector into three categories: agriculture, forestry and other industries. The secondary sector consists of manufacturing, electricity supply, gas supply, water supply and construction. The research classifies this sector into the following categories: food production, wood processing that includes such economic activities as: 1) sawing, planing and impregnation; 2) manufacture of carpentry and joinery products; 3) manufacture of furniture; 4) manufacture of wood packaging etc., as well as other manufacturing industries. The tertiary or services sector – enterprises providing various services for businesses and households – are classified into two broad categories: private services (wholesale and retail trade, construction etc.) and public services (utilities, education, health care, electricity

production, waste management etc.). Energy production belongs to the category of public services (LLU, 2015).

The development of municipalities is characterised by increase in the population and increase in PIT revenue per capita, while decrease in in the population and a low rate of increase in PIT revenue is considered to be the stagnation of the municipalities. In view of the 2009 administrative and territorial reform in Latvia, the available data on civil parishes were recalculated into the data for municipalities (population, PIT revenue). Indicators expressed in Latvian lats were converted into euros based on the official exchange rate set by the Bank of Latvia: 1 EUR=0.702804 LVL (LB, 2013).

A lot of statistical data are available at municipality level; accordingly, the present research performed a comparative analysis of the municipalities to identify the key trends. Since municipalities are large territorial units, for methodological purposes the research applied the approach of grouping according to selected criteria to perform a very detailed analysis. Such an approach allows with sufficient clarity to identify associations through analysing a broad spectrum of indicators; yet, it does not allow precisely determining the quantitative effects of the indicators.

Research results and discussion

1. Support payments for the municipalities of Latvia

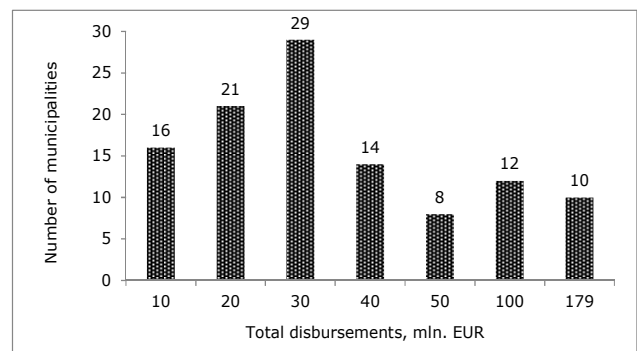
Territorial competitiveness can be seen to revolve around a number of dimensions. Firstly, social competitiveness, secondly, environmental competitiveness, thirdly, economic competitiveness concerns the ability of actors to produce and maintain maximum value added in the territory by strengthening links between sectors, and combining resources to create value in the specific character of products and local services (Quan J., Nelson V., 2005). In the EU, agricultural support tends to be concentrated in

wealthier regions where farms are large and productive (OECD, 2006).

In the period 2002-2015 in Latvia, the RSS disbursed EUR 4.610 billion in financial support; of the support, municipalities attracted EUR 4.126 billion (90 %), while cities of national significance – EUR 271.575 thou.

National support payments for municipalities totalled EUR 418.09 million (10 % of the total), project-related payments amounted to EUR 1 180.40 million (29 %), while the greatest amount was made up of area payments – EUR 2 527.43 million (61 %). Additional funding that was not linked to any particular municipality, e.g. technical assistance etc., totalled EUR 212.27 million, of which national funding comprised 16 % and EU funding accounted for 84 % of the total. The absorption of this funding affected the entire territory of Latvia.

The total amount of support payments for 66 municipalities of Latvia (60 % of their total number) did not exceed EUR 30 million, and an amount of more than EUR 179 million was received by only 10 municipalities (Figure 1).



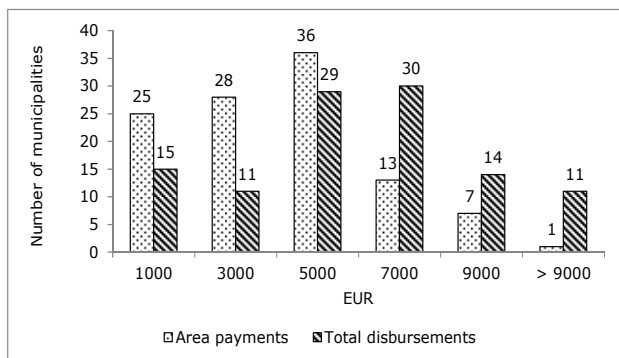
Source: authors' calculations based on CSB, 2016a, 2016b, 2016c, SRDA, 2016, SLS, 2014, LLU, 2014, RSS, 2016a, 2016b, 2016c, 2016d, Lursoft, 2016, LB, 2013

Fig. 1. Distribution of municipalities by total amount of funding disbursed by the RSS in the period 2002-2015, mln. EUR

Recent series of studies by the European Spatial Planning Observation Network (ESPON) found that support through Pillar I of the CAP (market support) and, to a lesser extent, Pillar II (rural development) is not focused on the most disadvantaged regions of the EU (at the NUTS 3 level) (OECD, 2006).

The total amounts disbursed by the RSS in municipalities were very diverse – beginning with EUR 1.25 million (Garkalne), EUR 3.23 million (Incukalns) and EUR 3.73 million (Carnikava) through to EUR 153.16 million (Talsi), EUR 153.18 million (Madona) and EUR 179.17 million (Jelgava).

An amount of payments disbursed strongly correlated with the UAA in a municipality (the correlation coefficient equalled 0.81) and the managed UAA (the correlation coefficient equalled 0.83). The amount of funding attracted by 37 municipalities was relatively small – less than EUR 20 million, which indicated that the municipalities had relatively small land resources. Besides, the funding was mainly attracted through project-type activities, and a smaller amount of funding was attracted in the form of area payments. The amount of national and EU funding attracted by 22 municipalities was greater than EUR 100 million, which indicated an essential role of land resources in ensuring the incoming cash flow.



Source: authors' calculations based on CSB, 2016a, 2016b, 2016c, SRDA, 2016, SLS, 2014, LLU, 2014, RSS, 2016a, 2016b, 2016c, 2016d, Lursoft, 2016, LB, 2013

Fig. 2. Distribution of municipalities by total amount of funding disbursed by the RSS in the period 2002-2015 per capita, EUR

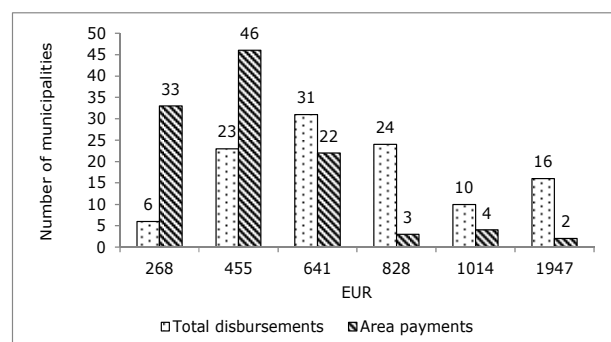
The areas of municipalities and therefore their UAA sizes vary greatly; for this reason, Figure 2 shows RSS disbursements measured per capita.

If measuring the amounts of funding disbursed by the RSS per capita, one has to conclude that the situation was very diverse. In most cases (59 municipalities or 54 % of the total) per-capita disbursements were in the range of EUR 3 000-7 000 for the entire period. Funding

in an amount of less than a thousand EUR was attracted by 15 municipalities. According to an analysis of the overall situation, Garkalne (EUR 159), Olaine (EUR 234) and Incukalns (EUR 423) received the lowest per-capita disbursements. The amounts disbursed by the RSS in Jaunpils (EUR 14 042), Naukseni (EUR 16 108) and Varkava (EUR 16 166) were the highest.

As regards area payments, the situation was more homogenous. The total amounts of funding disbursed in 89 municipalities did not exceed EUR 5 000 per capita. The smallest amounts of area payments were received by the municipalities of Saulkrasti, Carnikava and Garkalne, while the largest ones – by the municipalities of Naukseni, Baltinava and Varkava –, indicating that these municipalities had the largest UAA per capita, which generated a greater incoming cash flow for land owners living in the territory of the municipalities.

If measuring the amounts of funding disbursed by the RSS per hectare, one can find that it was in the range of EUR 268-828 for the majority (70 %) of municipalities. The municipalities of Garkalne (EUR 82), Olaine (EUR 155), Dundaga (EUR 190) and Ropazi (EUR 194) had the lowest disbursements. The municipalities of Rundale (EUR 1947), Tervete (EUR 1 925), Jaunpils (EUR 1640) and Saulkrasti (EUR 1623) received the highest disbursements.



Source: authors' calculations based on CSB, 2016a, 2016b, 2016c, SRDA, 2016, SLS, 2014, LLU, 2014, RSS, 2016a, 2016b, 2016c, 2016d, Lursoft, 2016, LB, 2013

Fig. 3. Distribution of municipalities by total amount of funding disbursed by the RSS in the period 2002-2015 per hectare, EUR

However, the total amounts of area payments per hectare for 101 municipalities were less than

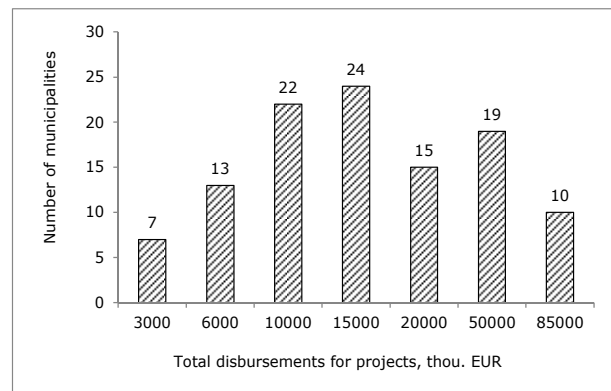
EUR 641. The municipalities of Mersrags (EUR 4), Saulkrasti (EUR 6), Garkalne (EUR 14) and Carnikava (EUR 20) had very low area payments if measured per hectare in the period 2002-2015. The municipalities of Rundale (EUR 1348) and Tervete (EUR 1228) received the highest area payments per hectare.

An analysis of the disbursements made by the RSS in municipalities of Latvia was performed in different aspects, and it allowed concluding that Garkalne municipality received the lowest disbursements – both the total disbursement within the entire period and the disbursements measured per capita and per hectare. Garkalne municipality was among the municipalities with the smallest UAA (423 ha) – a smaller UAA was reported only for Saulkrasti municipality with 157 ha – and its land quality was considerably poorer (24 points) than elsewhere in Latvia; these factors determined the low disbursements on the whole.

Over the five year period, the funding of the EAGF, the EAFRD and the EFF attracted for agriculture and rural development totalled EUR 1.962 billion (on average, EUR 17.83 million per municipality) was received – directly or indirectly – by local governments, residents and enterprises (Fig. 4).

The total amounts of funding attracted by municipalities considerably varied – the smallest amount was received by the municipalities of Garkalne (EUR 380 thou.), Carnikava (EUR 874 thou.) and Incukalns (EUR 1 mln.).

The total amounts of funding received by four more municipalities were less than EUR 3 million. The majority of municipalities of Latvia (55 %) attracted funding in an amount ranging from EUR 10 to 20 million. The municipalities of Rezekne, Madona and Jelgava attracted more than EUR 70 million; these municipalities had a large total area and a large UAA, high quality land and high agricultural activity.



Source: authors' calculations based on CSB, 2016a, 2016b, 2016c, SRDA, 2016, SLS, 2014, LLU, 2014, RSS, 2016a, 2016b, 2016c, 2016d, Lursoft, 2016, LB, 2013

Fig. 4. Distribution of municipalities by total amount of funding for EAGF, EAFRD and EFF projects in the period 2009-2013, thou. EUR

2. Associations between the amount of support payments and other socio-economic indicators for Latvia's municipalities

If measuring the amounts of EU funding for agriculture and rural development per capita, Latvia's municipalities were grouped into six groups. All the municipalities located next to Riga (11) and most Pieriga region municipalities (18 out of 24) belonged to the group having the smallest amounts of EU funding per capita (less than EUR 1000) (Table 1), which may be explained by the large number of residents and minimum agricultural activity in the municipalities. In contrast, the municipalities with the smallest populations had larger amounts of funding attracted if measured per capita. In Latvia, the average per capita amount of funding attracted equalled EUR 2501.

An analysis of the data reveals that there was a strong association between the amount of funding per capita and the amount of subsidies from the Local Government Equalisation Fund, the managed UAA and the turnover of primary sector enterprises: the greater the amount of funding, the greater the values of these indicators. This means that agricultural activity prevailed in eight municipalities with the highest funding per capita; yet, the efficiency of the agricultural activity was low, as the total RSS disbursements and area payments per capita

were low regardless of the large UAA and high land quality. The municipalities received large subsidies from the Local Government Equalisation Fund. The municipalities showed the greatest increase in PIT revenue, compared with 2004, while the average wage and salary and foreign

investment were average. Primary production prevailed in these municipalities, as the turnover of top 20 primary sector enterprises was 2.6 times greater than that of secondary sector enterprises and 2.1 times greater than that of services sector enterprises.

Table 1

Situation in municipalities broken down by per capita amount of funding for EAFRD and EFF projects in 2009-2013, EUR

| Indicators | Project funding per capita, EUR | | | | | |
|---|---------------------------------|-----------|-----------|-----------|-----------|--------|
| | ≤ 1000 | 1001-2000 | 2001-3000 | 3001-4000 | 4001-5000 | ≥ 5001 |
| Number of municipalities in a group | 22 | 23 | 28 | 21 | 8 | 8 |
| Population | 12467 | 9707 | 10563 | 6570 | 3706 | 2796 |
| Change in the population, % | 1.46 | 0.86 | 0.79 | 0.79 | 0.77 | 0.80 |
| Distance to Riga (average for the group), km | 38 | 121 | 157 | 165 | 200 | 148 |
| PIT revenue per capita, EUR | 613 | 395 | 326 | 336 | 304 | 314 |
| Increase in PIT revenue per capita, % | 2.50 | 1.48 | 1.54 | 1.88 | 1.67 | 3.18 |
| Average monthly wage and salary, EUR | 785 | 627 | 574 | 575 | 566 | 603 |
| Foreign investment per capita, EUR | 2093 | 1122 | 438 | 61 | 960 | 254 |
| ERDF, ESF, CF funding per capita, EUR | 1496 | 1422 | 2148 | 2296 | 1372 | 1198 |
| Local government equalisation funding per capita, EUR | -224 | 315 | 835 | 1070 | 1733 | 1384 |
| Managed UAA per capita, ha | 0.89 | 1.71 | 2.75 | 3.41 | 4.92 | 6.60 |
| Land quality, points | 35 | 38 | 39 | 36 | 33 | 44 |
| Forest area per capita, ha | 0.99 | 4.29 | 4.25 | 5.76 | 6.23 | 4.23 |
| Turnover of top 20 enterprises: | | | | | | |
| Total turnover per capita, EUR | 16861 | 6448 | 5117 | 5781 | 4082 | 5718 |
| Primary production, turnover per capita, EUR | 363 | 1542 | 945 | 1617 | 1378 | 3084 |
| Secondary production, turnover per capita, EUR | 3772 | 2246 | 1978 | 1831 | 1127 | 1199 |
| Services sector, turnover per capita, EUR | 13012 | 2926 | 2323 | 2547 | 1633 | 1490 |
| Total support payments paid by the RSS, EUR | 5482 | 5016 | 5889 | 4338 | 5614 | 4317 |
| area-based support payments, EUR | 3299 | 2991 | 3857 | 2644 | 3609 | 2798 |

Source: authors' calculations based on CSB, 2016a, 2016b, 2016c, SRDA, 2016, SLS, 2014, LLU, 2014, RSS, 2016a, 2016b, 2016c, 2016d, Lursoft, 2016, LB, 2013

Municipalities (22) with the lowest per capita funding are located closest to Riga (on average, 38 kilometres); the municipalities had the largest populations, and increases in their populations had been reported since 2005. The high average wage and salary, the high PIT revenue per capita, the large amount of foreign investment and a considerably higher turnover of enterprises mainly engaged in the services sector (predominantly wholesale trade) and in the secondary sector indicated the favourable business environment in these municipalities. A positive demographic and economic situation resulted in making contributions to the Local

Government Equalisation Fund. If measured per capita, natural resources (the UAA and forests) were scarce in these municipalities, the turnover of primary sector enterprises was low, compared with the other municipality groups. Despite these facts, the RSS disbursements, including area payments, were average.

But conclusions from the OECD (2006) are that despite bringing large resources into rural regions, agricultural subsidies are not intended to trigger rural development directly and, in most cases, they do not do so. The main reason for this is that this type of policy is focused on a small segment of the rural population (farmers

range of EUR 3 000-7 000 (the difference was 2 times).

and others involved in agricultural enterprises) rather than on places. But the integration with surrounding areas, both urban and rural, needs also to be considered. The benefits of stronger urban-rural cooperation include more efficient land use and planning, better provision of services (e.g. public transport, health) and better management of natural resources (Pascariu S., Czischke D. (2015).

Conclusions, proposals, recommendations

- 1) Various support payments play an essential role in the development of territories. In the period 2002-2015, EUR 4.610 billion were disbursed in Latvia through various support payment schemes, and municipalities attracted 90 % of the total or EUR 4.126 billion.
- 2) Of the total amount of financial support, 90 % was EU funding and only 10 % were national support payments, which indicated the essential role of the EU's policies in the development of territories in Latvia.
- 3) In municipalities, an essential role was played by area payments (61 % of the total amount), while funding for project-type activities comprised 29 % of the total amount. It is understandable, as the former funding depends on the area of a municipality, while the latter one is dependent on the activity of entrepreneurs in writing project proposals in order to attract the funding.
- 4) An analysis of the amounts of support payments per capita allows concluding that the situation in municipalities was different and the amounts ranged from EUR 159 to 16 166 (the difference was 102 times). In most cases (59 municipalities or 54 % of the total) per capita disbursements were in the

- 5) An analysis of the amounts of support payments per hectare of the territory of a municipality leads to a conclusion that the situation was different, and the amounts were in the range of EUR 82-1947 (the difference was smaller – 24 times). However, in most of the municipalities (70 %) the amounts ranged from EUR 268 to 828 (the difference was 3 times).

- 6) An analysis of the per capita amounts of funding for EAFRD and EFF projects for municipalities in the period 2009-2013 allows finding that:

- in Latvia, the average per capita amount of funding attracted equalled EUR 2501;
- municipalities located next to Riga and Pieriga region municipalities had the lowest funding per capita, as agricultural and fisheries activity in the vicinity of Riga was minimal. However, municipalities with the smallest populations attracted the greatest amount of funding;
- there is a strong association between the amounts of support funding per capita and the amounts of subsidies from the Local Government Equalisation Fund, the managed UAA and the turnover of primary sector enterprises.

Acknowledgements

The research was promoted with the support of the JSC "Latvian State Forests", Contract No. 5.5.-5.1._001q_101_14_42.

Bibliography

1. Central Statistical Bureau (CSB) (2016a). ISG12. Pastavīgo iedzīvotāju skaits statistiskajos reģionos, republikas pilsētas un novados gada sākumā (Resident population by statistical region, city and county). Retrieved: http://data.csb.gov.lv/pxweb/lv/Sociala/Sociala__ikgad__iedz__iedzskaits/ISO120.px/?rxid=cdbc978c-22b0-416a-aacc-aa650d3e2ce0 Access: 22.11.2016.
2. State Regional Development Agency (SRDA) (2016). *Regionālas attīstības indikatoru modulis Raim.gov.lv. (Regional Development Indicator Module RDIM.gov.lv)* Retrieved: <http://raim.gov.lv/cms/tiki-index.php?page=Datu+atlase> Access: 22.11.2016.
3. Rīga. *Attālumi līdz citām pilsētām* (2016). (Rīga. Distance to other Cities). Retrieved: <http://www.city-info.net/lv/terminal-11-11/noderiga-informacija-156/attalumi-lidz-citam-pilsetam-3934> Access: 22.11.2016.
4. Central Statistical Bureau (CSB) (2016b). DSG07. Strādājošo mēnesa vidēja darba samaksa republikas pilsētas un novados (euro) (Average monthly wages and salaries in cities under state jurisdiction and counties (in euro)). Retrieved: http://data.csb.gov.lv/pxweb/lv/Sociala/Sociala__ikgad__dsamaksa/DS0070_euro.px/?rxid=cdbc978c-22b0-416a-aacc-aa650d3e2ce0 Access: 22.11.2016.
5. LLU (2014). Gala atskaite par projektu „Zemes ekonomiski efektīva, ilgtspējīga un produktīva izmantošana lauksaimniecības un mezsaimniecības produkcijas ražošanai”. 2014. gada janvāris (Final report on the project “Economically Efficient, Sustainable and Productive Use of Land for the Production of Agricultural and Forestry Products. January 2014), p. 260.
6. Rural Support Service (RSS) (2016a). *Platību maksājumi (Area Payments)*. Retrieved: <http://www.lad.gov.lv/lv/statistika/platibu-maksajumi/> Access: 20.11.2016.
7. Rural Support Service (RSS) (2016b). Operatīva informācija par apmaksājamiem ELFLA (2007-2013 planosanas periods) projektiem sadalījuma pa LAD strukturvienībām, EUR (Operational information on funded EAFRD projects (programming period 2007-2013) by RSS department, EUR). Retrieved: http://www.lad.gov.lv/files/el fla_2007_2013.pdf Access: 20.11.2016.
8. Rural Support Service (RSS) (2016c). Operatīva informācija par apmaksājamiem EZF projektiem sadalījuma pa LAD strukturvienībām līdz 31.12.2013., LVL (Operational information on funded EFF projects by RSS department until 31.12.2013., LVL). Retrieved: http://www.lad.gov.lv/files/el fla_2007_2013.pdf Access: 20.11.2016.
9. Rural Support Service (RSS) (2016d). *Lauku reģistrs*. Lauku reģistra ģeogrāfiskās informācijas sistēmas datu bāze (*Rural Register. Database of the geographic information system of the Register of Fields*). Unpublished resource. Retrieved: <http://www.lad.gov.lv/lv/atbalsta-veidi/platibu-maksajumi/lauku-registrs-un-karte/LAD>. Access: 20.11.2016.
10. Lursoft (2016). *Lursoft statistika (Lursoft statistics)*. Retrieved: <http://www.lursoft.lv/lursoft-statistika/> Access: 21.11.2016.
11. State Land Service (SLS) (2014). VZD pārskats Latvijas Republikas administratīvo teritoriju un teritoriālo vienību zemes datu bāze uz 2013. gada 1. janvāri (SLS report Database for the Land of Administrative Territories and Territorial Units of the Republic of Latvia as of 01.01.2013).
12. Bank of Latvia (LB) (2013). *Latvijas Bankas noteiktie valūtu kursi 31.12.2013 (Exchange rates set by the Bank of Latvia until 31.12.2013)*. Retrieved: <https://www.bank.lv/statistika/valutu-kursi/vesturiskie-kursi-lidz-2013-gada-31-decembrim> Access: 21.11.2016.
13. Administratīvo teritoriju un apdzīvoto vietu likums (Law On Administrative Territories and Populated Areas) (2008). Published by Latvijas Vestnesis, No. 202 (3986), 30.12.2008., "Zinotājs", No. 3, 12.02.2009.
14. LLU (2015). Petījuma "Dzādu zemes apsaimniekošanas modeļu sociāli ekonomiskais novērtējums" III daļa Teritoriju attīstību veicinošo faktoru noteikšana. 2015. gada decembris (Research "Socio-economic Assessment of Various Land Management Models" Part III Identification of Factors Promoting Territorial Development. December 2015), p. 70. Retrieved: <http://www.lvm.lv/petijumi-un-publikacijas/dzadu-zemes-apsaimniekosanas-modeļu-sociali-ekonomiskais-novertejums> Access: 24.11.2016.
15. Quan J., Nelson V. (2005). *Territory and rural development: concepts, methods and approaches (literature review)*. A Research Paper for DFID Central Research Department (Project R8736). Land and Territory Research Paper No. 2 December 2005. Natural Resources Institute, University of Greenwich, UK, 59 p.
16. OECD Rural Policy Reviews (2006). The New Rural Paradigm POLICIES AND GOVERNANCE. p. 168.
17. Mylott E. (2009). Urban-Rural Connections: A Review of the Literature. p. 40.
18. Pascariu S., Czischke D. (2015). Promoting Urban-Rural Linkages in Small and Medium Sized Cities. URBACT Study New Concepts and Tools for Sustainable Urban Development 2014 – 2020. Final Thematic Report 07 July 2015, 47 p.
19. George Washington Institute of Public Policy and RW Ventures, LLC (2011). *Implementing Regionalism: Connecting Emerging Theory and Practice to Inform Economic Development*, November 2011, 248 p.
20. Partridge M.D., Clark J. (2008). *Our Joint Future: Rural-Urban Interdependence in 21st Century Ohio*. July 15, 2008. White paper prepared for the Brookings Institution. Retrieved: <http://www.brookings.edu/~media/events/2008/9/10%20restoring%20prosperity/partridge.pdf> Access: 26.11.2016.
21. Partridge J., Nolan J. (2005). *Commuting on the Canadian Prairies and the Urban/Rural Divide*. In: Canadian Journal of Administrative Sciences, Vol. 22, No. 1, pp. 58–72.
22. Kawka R. (2013). Rural-urban Partnerships and Rural Development. In: New Paradigm in Action on Successful Partnership. M. Kolczynski (ed.). Ministry of Regional Development, Warsaw, p. 51-64. Retrieved: http://www.mrr.gov.pl/english/Regional_Development/Regional_Policy/NSRD/doc_str/Documents/MRD_NPA_on_successful_partnerships.pdf Access: 20.11.2016.

23. Kuznets S. (1971). *Modern Economic Growth: Findings and Reflections*. Retrieved: http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1971/kuznets-lecture.html Access: 21.11.2016.
24. Lonska J. (2014). *Teritoriju attīstības novērtēšana Latvijas reģionos (Assessment of Territorial Development in the Regions of Latvia)*. Daugavpils University. Retrieved: http://du.lv/files/000/010/849/Jelenas_Lonskas_promocijas_darbs_save.pdf?1421153890 Access: 28.11.2016.
25. Farrugia N., Gallina A. (2008). *Developing Indicators of Territorial Cohesion*. Retrieved: http://rudar.ruc.dk/bitstream/1800/5276/1/Research_Report_1_2008_Farrugia_Gallina.pdf Access: 26.11.2016.
26. Duhr S., Colomb C., Nadin V., (2010). *European Spatial Planning and Territorial Cooperation*. London: Routledge.
27. INTERCO - Indicators of Territorial Cohesion (2012) *Final Report*. ESPON & University of Geneva. Retrieved: http://www.espon.eu/main/Menu_Projects/Menu_ScientificPlatform/interco.html Access: 23.11.2016.
28. Vesperis V. (2012). *Regionālās attīstības novērtēšana (Regional Development Assessment)*. Retrieved: <http://www.llu.lv/aktualitates?op=raksts&id=7597>. Access: 23.11.2016.
29. Hermansons Z. (2012). Teritorijas attīstības indeksa praktiska pielietojuma analīze un tā pilnveidošanas iespējas (Analysis of the Practical Application of the Territorial Development Index and Opportunities for its Enhancement). In: Rīga Technical University proceedings: Vol. 3, No. 22., pp. 59-65.
30. Boisier S. (2005). Is there Room for Local Development in a Globalized World? *Cepal Review* 86, August 2005. Retrieved: http://repositorio.cepal.org/bitstream/handle/11362/11091/86045060I_en.pdf?sequence=1. Access: 23.11.2016.
31. Bellu L. G. (2011). *Development and Development Paradigms. A (Reasoned) Review of Prevailing Visions* EASYPol Resources for Policy Making. Retrieved: http://www.fao.org/docs/up/easypol/882/defining_development_paradigms_102en.pdf. Access: 28.11.2016.
32. Quan, J., Nelson, V. (2005). *Territory and Rural Development: Concepts, Methods and Approaches (literature review)*. Land and Territory Research Paper No. 2. Retrieved: http://r4d.dfid.gov.uk/PDF/Outputs/Mis_SPC/R8376_2-Territory-and-rural-development.pdf. Access: 28.11.2016.

RESOURCES OF ENVIRONMENT: ASPECTS OF SMART RURAL DEVELOPMENT

Maira Ore¹; Mg.oec and Vija Melbarde², Mg.paed

^{1,2}Institute of Social, Economic and Humanities Research of Vidzeme University of Applied Sciences

Abstract. The precondition for a state sustainable development is growth of national economy, rational use of resources, and welfare of population, preservation of high quality environmental and cultural heritage. Smart growth of rural areas supports sustainable development, which is achieved by promoting research, innovation, and knowledge. Vidzeme Planning Region (VPR) is one of the five Latvia's planning regions, in which the authors of the long-term development plan have set the smart specialization fields to be developed to provide a balanced and sustainable development.

Analysis of local resources, their evaluation and proficient use contribute to the ability of businesses to implement creative ideas, to introduce new technologies and raise the competitiveness of the existing products, which are the key preconditions for regional development and the mission of smart specialisation.

The aim of this research was to carry out an evaluation of the available environmental resources in Vidzeme region and their exploitation in order to identify the unnoticed options for smart development of the region. For this reason, the authors carried out analysis of strategic planning documents, focus group interviews, grouping and analysis of data and information.

As the result, the authors identified the VPR potential and possibilities of utilization of environmental resources for the provision of smart development of the region. The theoretical and practical outcomes may be used for development of a joint smart environment concept and strategic planning documents.

Key words: resources of environment, smart environment, rural areas, smart development.

JEL code: R

Introduction

In 2010, the European Union adopted the notion "smart" in its new ten-year growth strategy *Europe 2020* stating that Europe should become a smart, sustainable, and inclusive economy. Smart growth supports sustainable development, which is achieved by promoting research, innovation, and knowledge (Naldi L., Nilsson P., Westlund H., Wixe S., 2016).

The main precondition for sustainable development is implementation of a balanced and polycentric country development model providing balanced development of the area, accessibility of services and growth of national economy. Balanced economic development of a country is possible only with economically strong regions (Melbarde V., Ore M., 2016).

Vidzeme Planning Region (VPR) is one of the five planning regions in Latvia, which is the largest by area according to the data of 2016 (15 220 km²) and the least populated (213 438 residents) (State Regional Development Agency, 2016). The region comprises 26 municipalities, 25 of which are counties and one city of national

importance (Vidzeme Planning Region, 2015). After assessment of competitive advantages of the area and its innovation potential, the development strategy makers have defined smart specialization spheres for VPR which should be developed to provide a balanced and sustainable development (Vidzeme Planning Region, 2015). Smart specialization resource analysis and implementation of smart specialization into practice plays a crucial role in this economic transformation process.

On the basis of the "EDORA Cube" methodology used in ESPON research (ESPO and UHI Millennium Institute, 2011), the researchers have identified the following sustainable and smart area development characteristics: smart economy, smart people, smart governance, smart mobility, smart environment, smart living, pointing out the influencing factors and indicators (Centre of Regional Science, 2007, Bulderberga Z., 2015). For in-depth analysis the authors have chosen a group of smart environmental factors as the search of wise balance between the economic

¹Corresponding author. Tel.: +37127078287; E-mail address: maira.ore@va.lv

development and requirements of environmental protection, estimation, effective and innovative use of the existing environmental resources promotes the ability of regional companies to create new products and raise the competitiveness of the existing ones, which is one of the most important preconditions for regional development and the mission of the smart specialization strategy (Vidzeme Planning Region, 2014).

The aim of this research was to carry out an evaluation of the available environmental resources in Vidzeme region and their exploitation in order to identify the unnoticed options for smart development of the region.

To reach the goal, the following objectives were set: to carry out an analysis of strategic documents and previous researches within the national and VPR environmental policy; to evaluate environmental resources of VPR and their smart exploitation; to elaborate recommendations for an implementation of development directions of smart environment in VPR.

To identify the goals of environmental policy development in Latvia and VPR, as well as the theoretical framework and characterising criteria of the concept "smart environment", initially the authors carried out the analysis of strategic documents and previous research on national and VPR development and environmental policy. It was found that the guidelines of environmental policy documents of Latvia have not defined the concept of "smart environment", as well as there is a lack of common performance indicator system for the goal assessment. On the basis of sustainable and smart development concept expressed in policy document guidelines, the authors propose their own definition of „smart environment“, which is the main scientific novelty in the research. In the context of definition the authors have identified the following main components of smart environmental resources: road and communications infrastructure,

available nature resources and their usage. Relevant statistical data has been chosen to characterize the smart features of the above (road network density, km/km²; forest cover, %; mineral reserves, thousand m³; proportion of cultivated agricultural land, % and financing of Rural Support Service, EUR). Considering that the indicator analysis offers only a general view of environmental resource potential and exploitation in VPR, but it apparently does not indicate the aspects of smart features, the authors carried out focus group interviews in Mazsalaca and Koceni counties in order to characterize the situation more completely and to identify the opportunities and problem areas. The chosen areas have strikingly different indicators of a development pace and level, as well as the location. In order to reach a more extensive view of smart development of the environment, employees of local municipalities, entrepreneurs and representatives of non-governmental organizations were invited to participate in the focus groups. To confirm the possibility of environmental resources exploitation in VPR according to implementation of smart specialization strategy, which provides a balanced and sustainable development of the region, the authors identify VPR examples of good practice in smart exploitation of environmental resources.

Research Results and Discussion

Sub-part 1. Assessment of Strategic Environmental Policy Documents

In 2010 Saeima of the Republic of Latvia adopted sustainable development strategy until 2030 for development of rural areas, which encouraged closer urban and rural interaction including recreation and living possibilities for the urban population; the development of high quality interconnecting transport infrastructure, in particular by improving the quality of roads, electronic communications and public infrastructure, thus creating an attractive living

environment in rural areas (Vidzeme Planning Region, 2015).

The strategy of sustainable management of natural values and services points out the following goal: "To be the EU leader in the preservation, growth and sustainable use of environmental capital." (Saeima of the Republic of Latvia, 2010). Whereas one of the directions in the Latvian National Development Plan 2014-2020 states: "Preserve environmental capital as a basis for sustainable economic growth and contribute to its sustainable use, reducing the natural and man-made risks to environment quality." (Cross-Sectoral Coordination Centre, 2012).

Latvia has elaborated "Environmental Policy Guidelines for 2014-2020" in accordance with long-term national planning documents. Latvia's environmental policy principles, including the principle of sustainable development outcomes from the policy implemented in the country, are based upon international experience and are secured in Latvia's environmental protection laws and regulations. Previously included environmental protection objectives stated in policy planning documents have been achieved, which is also testified by the high environmental rating in environmental performance index by Yale and Columbia Universities (The Environmental Performance Index-EPI) (in 2012 Latvia held the high second place among more than a 100 evaluated countries) and other assessments (UN Convention reports, the European Environment Agency evaluations) where the environment of Latvia is assessed mostly positively (Ministry of Environmental Protection and Regional Development of the Republic of Latvia, 2014).

To attain the set objectives and their follow-up supervision, it is necessary to set quantitative goal indicators. With regard to environmental resources for Latvia's sustainable development strategy until 2030, indicators characterizing nature as the future capital and spatial

development perspective were chosen (Saeima of the Republic of Latvia, 2010). On the other hand, indicators in Latvian National Development Plan 2014-2020 are focused on the introduction of new technologies and progress in efficient use of resources, comfortable and safe accessibility of development centres, as well as provision of convenient accessibility in the electronic form (Cross-Sectoral Coordination Centre, 2012).

All VPR municipalities, except three, have developed legitimate strategies of sustainable development, the medium term priorities of which have been assessed by VPR Strategy authors (Vidzeme Planning Region, 2015).

Although the majority of VPR municipalities put a significant emphasis on improvement of entrepreneurial and environmental infrastructure, diversification of businesses and other important aspects of development and introduction of smart specialization sectors, however, too little attention is paid to a number of important tasks, such as strategic partnership, knowledge transfer, and promotion of remote employment.

Sub-part 2. Resources in Vidzeme Planning Region

Exploration of local resources, their evaluation and proficient use contribute to the ability of entrepreneurs to implement creative business ideas, to introduce new technologies and raise the competitiveness of the existing products, which are the key preconditions for regional development and the mission of smart specialization. To analyze the dimension of smart environment, it is important to define what it implies.

Environmental policy documents of Latvia do not accentuate the notion "smart environment". One of the most commonly used indicator systems for smart environment analysis highlights the following indicators: attractiveness of natural conditions, pollution, environmental protection, sustainable resource management (Granath M., 2016). Researchers of the National Research Programme EKOSOC-LV 5.2.3. Project

"Latvian Rural and Regional Development Processes and Opportunities within the Context of Knowledge Economy" selected the following indicators: infrastructure (road network density, km/ km²), available resources (forest cover, %, mineral reserves, thousand m³, 2013) and use of resources (proportion of cultivated agricultural land (UAA), %, and financing of Rural Support Service (RSS) (2001-2015), EUR).

On the basis of sustainable and smart development concept expressed in policy document guidelines, the authors have formulated "smart environment" definition, which is a novelty in research and may serve as a basis for scientific discussion. "**Smart environment** is an innovative ambient system in which a person is willing and able to make effective use of technological and natural resources with an aim to improve the quality of life and competitiveness while ensuring skilful and sustainable use of nature resources satisfying the economic, social and environmental aspects of the present and future generations". On the basis of the definition, the authors have identified the following smart environment aspects: road and communications infrastructure, available nature resources and their usage. The article will deal with more detailed analysis of Vidzeme Planning Region on the basis of assessment of strategic documents and statistical data, earlier research and interviews.

Vidzeme is the European Union border region crossed by several major international transport corridors, ensuring direct contacts with major regional centres in neighbouring countries. In the context of market acquisition and transport of goods, a great role is played by the location of the business. A great part of Vidzeme rural areas is located near traffic flows (Vidzeme Planning Region, 2015).

At present, the competitiveness of the region, accessibility and development of places is largely dependent on high quality **road and communications infrastructure** (Vidzeme

Planning Region, 2015). Since restoration of independence there has not been a year when the state funding for roads could be described as sustainable. In 2019 the EU funding for roads in Latvia will sharply decrease reaching 68.7 million euro in comparison to 2017 with the financing of 127 million euro, but in 2020 there will be no EU financing for roads at all. Due to the poor condition of the roads, the national economy suffers 880 million euro losses every year; it is created by higher vehicle operational costs, longer journey time and the corresponding increase in fuel consumption (Financenet, 2017).

In 2015 the total length of Latvia's roads (without including municipal streets) averaged 0.02 km per capita while in VPR it was 0.05 km. The state and municipal road ratio was 40 %:60 %, while in Vidzeme region it was 45 %:55 %. As regards the road surface, the average indicators in Latvia and Vidzeme are analogous: approximately 20 % of the state and municipal roads are asphalt covered, while the remaining 80 % are crushed stone and gravel covered roads; in addition, the situation has not significantly improved compared to 2010 (18 %:82 %) (Central Statistical Bureau, 2016). According to the information from JSC "Latvian State Roads", 44 % of asphalt covered roads and 43 % of gravel roads are currently in poor or very poor condition. While the condition of asphalt covered roads is gradually improving, the condition of gravel roads is deteriorating (Financenet, 2017). After assessing the indicators of road surface quality, it may be concluded that the quality of roads in Latvia, including VPR, is critical, and the recent years have not seen any significant improvements, which in many cases prevents or hinders implementation of smart specialization in transport of raw materials and finished products and may affect customer satisfaction, for instance, in the smart specialization field of sustainable tourism.

The future development of the region will increasingly be affected by people and transport

flows generated by cross-border cooperation. The main beneficiaries will be the areas located in the immediate vicinity of the traffic flow, thus being able to use various advantages, like better developed transport infrastructure, better job opportunities in the service and recreational sectors. Areas located further off from intensive flows or big cities may develop as niche service areas using the local resources (State Regional Development Agency, 2009). At the same time, we should consider alternative transport options. However, a radical improvement in access to Vidzeme will not be possible even in 20 years' time. The development dependence on transport infrastructure may be partly compensated by promoting the employment of people in their places of residence by focusing more on high-speed internet coverage and developing

knowledge economy spheres in the region (Vidzeme Planning Region, 2011). Research proves that Latvia has the sixth fastest internet in the world, while access to the Internet in Vidzeme Region is relatively better than in other regions of Latvia, except Riga and Greater Riga (Vidzeme Planning Region, 2014). The internet and digital environment allows not only services and information, but also offers remote work and education possibilities while reducing the necessity for transport use and frequency (Saeima of the Republic of Latvia, 2010).

The key **natural resources** are made up by forest land and timber reserves, agricultural land, mineral reserves and drinking water. In Table 1 the authors have compiled the statistical data of smart environment indicators.

Table 1

Smart environment indicators in VPR

| | Total road network density, km/km² | Forest cover in the county, % | Mineral reserves, thousand m³ | Cultivated UAA from total UAA, % | Financing of RSS, EUR |
|-------------------------|--|--------------------------------------|--|---|--------------------------------|
| Average in VPR | 1 | 49 | 4 208 | 86 | 43 921 222 |
| Maximum value in VPR | 1.381 Cesis county | 65 Lubana county | 20 706 Ape county | 93 Naukseni, Varaklani counties | 153 183 479 Cesis county |
| Minimum value in VPR | 0.364 Lubana county | 22 Varaklani county | 0 Cesis, Ergli, Ligatne, Lubana, Rujiena counties | 77 Amata county | 3 726 704 Koceni county |
| Average in Latvia | 0.937 | 45 | 5529.75 | 82 | 37 508 297 |
| Maximum value in Latvia | 4.761 | 73 | 63735.43 | 98 | 179 171 095 |
| Minimum value in Latvia | 0 | 14 | 0 | 36 | 1 246 003 |

Source: author's construction based on the Central Statistical Bureau, 2015; Latvian Environment, Geology and Meteorology Centre, 2012; State Regional Development Agency, 2015

Data in Table 1 show that the average road density in VPR is slightly above the average in Latvia, however, it does not describe the quality of infrastructure.

Vidzeme region forest land proportion in 2014 was 55.8 %, which shows that it is the most forested area compared to other regions of Latvia, and this trend is increasing. The tree-type structure does not differ significantly from the

total percentage of coniferous and deciduous trees in the country (Central Statistical Bureau, 2015). Consequently, Vidzeme has great opportunities to develop forestry and recreation in forested areas.

Compared to other regions of Latvia, Vidzeme has limited amount of construction materials (dolomite, gypsum, limestone, sand-gravel, sand, quartz sand, clay) (74 034 thousand m³) and

peat (25 702 thousand tonnes). Raw material resources for construction are mainly found in local deposits, some of them are located in the territory of the Gauja National Park, so the extraction is possible only according to the park regulations. The region has favourable conditions for peat formation processes, however, its utilization for energy purposes is negligible (Vidzeme Planning Region, 2011, 2013, 2014b). According to the data from the Latvian Environment, Geology and Meteorology Centre, the average amount of mineral resources in VPR is smaller than in Latvia, these natural resources are not found in five counties of Vidzeme.

Agricultural land (UAA) in Vidzeme region takes up one third of the total area, including cultivated land, which comprises 86 % (average in Latvia – 82 %) (Central Statistical Bureau, 2015). The share of uncultivated land of about 14 % is a considerable unnoticed opportunity in the situation of rapidly increasing demand for food in the world. The growing impact of intensive agriculture will need a balance with the almost unaffected rural landscape and preservation of small rural farmsteads (Vidzeme Planning Region, 2014b).

The Rural Support Service financing allocated to the region describes the ability of its residents to attract financial resources and their potential in acquisition of agricultural resources.

The Latvian scientists successfully proceed with the research of forest and subsoil resources; it would provide sustainable use of forestry and subsoil resources, rational exploitation of local resources in the global market for production of competitive products, while maintaining sustainability, biological diversity and the social role of forests (Latvian State Institute of Wood Chemistry, 2014). The results of completed research are vital for the development of smart specialization (competitive material from wood (including fast-growing) and creation of innovative niche products, for instance, research of clay properties with an aim to use it in

sunscreens; stabilization of emulsion; obtaining of a new granular sorbent; differential treatment of clay and carbonate containing rocks for development of new ceramic materials; research of peat properties; clay modification solutions; sorption study, etc. (Segliņš V., Bērziņa-Cimdiņa L., Sedmale G., Švinka R., Kļaviņš M., Muter O., 2016).

Needs of the population, increasing demand for comfort, rise of the living standard and freedom of movement significantly and rapidly increase the depletion of natural resources. In its turn, sustainable use of natural resources means high economic achievements, without harming the environment and nature, economical use of all natural resources, especially non-renewable ones, and, where possible, replacing them with renewable natural resources (Latvian Environment, Geology and Meteorology Agency, 2007).

Compared to many regions of the world and the European countries, Vidzeme region has pristine environment, a stable balance of ecosystems and a lower level of environmental pollution. The Gauja National Park and the primeval valley of the Gauja River, North Vidzeme Biosphere Reserve, Teici Reserve and other protected natural objects are integral values of Vidzeme region.

Comparing the average statistical indicators in Latvia and VPR, it may be concluded that, with exception of mineral resource deposits, the other indicators of infrastructure, available resources, and their rational use are higher in VPR than the average in Latvia. This indicates that availability of resources, their rational use and recreation, activities in fund raising are important preconditions for the desirable progress towards smart specialization.

Sub-part 3. Use of Environment Resources in VPR

To identify the VPR environmental resource potential and possibilities for their use in introduction of smart specialization area, the

authors conducted focus group interviews in Mazsalaca and Koceni county research areas.

The county residents evaluate road and communications infrastructure as a critical factor for long-term development. In this respect, Koceni has a considerable advantage as the county is located near a motorway and borders on the largest VPR city Valmiera, which is the centre of administrative and economic development, education, culture and sports in Vidzeme region. The intensive traffic flow on the main national motorway is regarded as a drawback as it increases travel time. Mazsalaca county is located off the major centres and despite the wide road network, the development of the area is hindered. Although the county borders on Estonia, entrepreneurs do not actively use the neighbouring market opportunities where one of the influencing factors is infrastructure. The road quality problem is more acute for residents near the Estonian border than for Koceni residents near Valmiera city. The claims are mainly about the quality of the national road, the maintenance of which is not the competence of the local municipality; yet, as the consequence, the entrepreneurs face additional costs on vehicle maintenance and sometimes also overdue deliveries. Overall, the Internet availability is regarded as good except for remote areas. Yet, it creates problems in some individual cases of remote work in knowledge intensive sectors requiring high-quality communications' infrastructure.

Both research counties may boast of attractive nature **landscapes**; however, it is necessary to promote and advertise this resource to use it in a more versatile way. A positive factor is the growing environmental awareness of the population. The respondents mentioned facts of fast degrading landscape, farmhouses with surrounding tree clusters turning into ruins, there is too little support to the small farms willing to operate in this field. A geologically rich area (Mazsalaca, Rujiena, Naukseni) is not officially

conferred a respective legal status on a national level; it prevents to turn it into a European Geopark, which would attract a particular category of travellers. Residents of Koceni county mentioned a new perspective service – small-scale site supervision and maintenance.

Evaluating the **unnoticed options** of the county economic development, the employees of Koceni municipality admitted minimum use of scientific research potential by the entrepreneurs, which is the key to optimizing business processes and reaching better results. The direction to be developed is professional forest management as poor management skills hinder the use of this resource to the full extent.

Mazsalaca municipality employees believe that sustainable development and smart specialization mean creating maximum comfortable and creative environment to support modern and innovative sectors. The main challenge for Koceni municipality is to create the possibly most creative living and business environment, to find a balance among business, living, social and cultural environment. In both counties, there is a tendency that agricultural companies (especially the small ones) see a perspective in shifting to organic farming in relation to environmental conservation and sustainability. Tourism is indicated as a promising services' industry direction. Entrepreneurs flexibly respond to change; manufacturing enterprises have a great potential for export (woodworking, dairy farming, ceramics, charcoal, pellets, peat extraction). Entrepreneurs are aware of the risk diversification and the role of increase of added value in their economic activity.

VPR has defined the following smart specialization areas to be developed in order to provide a balanced and sustainable development: high value-added wood products; healthy food and beverages; recreation and sustainable tourism; rehabilitation and health care services; the use of biomass for chemical processing and energy; smart materials, information technology;

creative industries; remote professional services. Perspective niche products were identified for each sphere of smart specialization (Vidzeme Planning Region, 2015). Current unsustainable consumption and production models contribute to

depletion of natural resources and threaten the services provided by the ecosystem; therefore, it is necessary to identify examples of good practice, shown in Table 2.

Table 2

Identified examples of good practice of smart specialization in successful exploitation of environmental factors in VPR

| Sphere of smart specialization | Example of good practice |
|---|---|
| Creative industries | Vaidava Ceramics "Rebeka", Ltd. produces a variety of tableware and interior objects from the Latvian red clay. All production waste is re-used. The factory welcomes tourist groups and individual travellers. |
| Information technologies | "Wunderkraut Latvia", Ltd. deals with development of Web projects on the basis of the open code software. |
| Environmental awareness and recreation | Foundation "Zeme. Cilveks. Stari" ("Earth. Human Being. Rays") activity is clean-up organization. During its operation 7 hectares of degraded areas have been recovered, creating a unique nature terrain and a nature park, a health trail and a family area. |
| Production of healthy food and beverages | "Kainazi", Ltd. – birch sap extraction and processing. The manufactured product (sparkling birch sap with a variety of different flavours, birch sap syrup, dandelion wine) is also exported; new technologies are applied in the production. The company supports environmentally friendly farming and welcomes tourists. |
| High added-value wood products | "Dores", Ltd. example illustrates how collaboration of an enterprise of wooden houses with researchers and architects can bring added value and export capacity. Moreover, the company is socially responsible, emphasizing environmental protection and the importance of local activity in practice. |
| Use of biomass for chemical processing and energy | Agricultural Services Co-operative "Daiva" has invested in purchase of hot air generator for a grain drying kiln which uses chaff as fuel, thus converting waste into energy which is economically viable and environmentally friendly. |

Source: author's construction based on Foundation "Zeme.Cilveks. Stari", 2017; "Kainazi", Ltd., 2017; Rone M., 2016; Vaidava Ceramics "Rebeka", Ltd. 2017; Vidzeme Planning Region, 2015; "Wunderkraut" Latvia, Ltd, 2017

These examples from the practice of VPR entrepreneurs prove that it is possible to successfully develop business by skilful and creative use of environmental resources. An essential issue is that smart specialization does not refer only to high technological innovations, but to non-technological innovations as well.

Conclusions, Proposals, Recommendations

1) Smart rural development is affected by environment. Smart environment is an innovative ambient system in which a person is willing and able to make effective use of technological and natural resources with an aim to improve the quality of life and competitiveness while ensuring skilled and sustainable use of natural resources satisfying the economic, social and environmental aspects of the present and future generations. The authors identify the main environmental

- components: road and communications, available nature resources and their usage.
- 2) State and local government strategic documents use different programming methodology, in some cases there is no indication of a specific action to reach certain goals, a single performance indicator system for goal assessment has not been elaborated, which limits objective assessment of achievements and comparative analysis of moving to sustainable long-term development on a regional, national and international scale. Policy makers should agree upon a single theoretical framework for smart development that would serve as a basis for development of coherent planning documents.
 - 3) The limiting factor for VPR smart development is the road infrastructure quality; the road infrastructure's efficiency and possibilities of its optimization should be re-evaluated; it is necessary to make changes in the financing

model of the national and municipal road maintenance.

- 4) It is possible to reduce the negative impact of the road infrastructure, providing high quality high-speed internet coverage to enhance remote work and education opportunities in knowledge and creative industries.
- 5) VPR has a favourable geographical location. Low population density, pristine unpolluted nature areas are favourable preconditions for recreation and sustainable tourism development and choice of living space or recreation area.
- 6) Forest quantity and quality create good prospects for production of wood products with high added value; forests are an integral part of mosaic landscape and a significant recreational potential. Improving managerial competences and knowledge of forest professionals would positively affect forest productivity and sustainability.
- 7) Vidzeme has relatively limited mineral resources. Rational use of these resources and active collaboration with scientists would

increase added value to the existing products and create new niche products, which is proved by the examples of good practice.

- 8) Entrepreneurs in VPR rural areas flexibly respond to economic changes, they are aware of the importance of environmental resources for manufacturing products with high added value, the importance of business transformation and diversification and the responsibility to the future generations for preservation of environmental resources.
- 9) Limiting factors for smart use of resources in the research area are: insufficient use of scientific potential and caution in attraction of external financing.

Acknowledgement.

The paper was supported by the National Research Program EKOSOC-LV 5.2.3., a subproject for Latvian rural and regional development processes and opportunities in the context of the knowledge economy regarding development of rural areas and affecting indicators.

Bibliography

1. Bulderberga Z. (2015). Indicators to Evaluate Smart Territorial Development. Retrieved: http://www.lza.lv/images/stories/EKOSOC-LV/videokonference/Bulderberga_LV-PL_2015.pdf Access: 15.01.2017
2. Central Statistical Bureau, Republic of Latvia(2016).Retrieved: <http://www.csb.gov.lv/dati/statistikas-datubazes-28270.html> Access:02.01.2017
3. Centre of Regional Science. (2007). Smart cities Ranking of European medium-sized cities. Retrieved: http://www.smart-cities.eu/download/smart_cities_final_report.pdf Access: 02.01.2017
4. Cross-Sectoral Coordination Centre. (2012). Latvijas Nacionalais attistibas plans 2014. – 2020.gadam (National Development Plan of Latvia for 2014–2020). Retrieved: http://www.pkc.gov.lv/images/NAP2020_%20dokumenti/20121220_NAP2020_apstiprinats_Saeima.pdf Access: 20.12.2016
5. Granath M. (2016). The Smart City – how smart can 'IT' be? Retrieved: <https://liu.diva-portal.org/smash/get/diva2:956501/FULLTEXT01.pdf> Access: 15.01.2017
6. ESPON and UHI Millennium Institute. (2011). European Development Opportunities for Rural Areas. Final Report. Retrieved:http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/EDORA/EDORA_Final_Report_Parts_A_and_B.pdf Access: 15.01.2017
7. Financenet. (2017). Latvija parliecinosi zemakais valsts finansejums celiem starp Baltijas valstim(Proven lowest public funding for roads in Latvia among the Baltic States).Retrieved: http://financenet.tvnet.lv/zinas/642475-latvija_parliecinosi_zemakais_valsts_finansejums_celiem_starp_baltij Access: 11.01.2017
8. Foundation "Zeme.Cilveks.Stari"(2017).Retrieved: <http://stari.lv/> Access: 12.01.2017
9. "Kainazi", Ltd. (2017). *About Birzi*. Retrieved: <http://birzi.lv/en/>Access: 12.01.2017
10. Latvian Environment, Geology and Meteorology Agency.(2007). *Ilgtspejigas attistibas indikatoru parskats 2006 (Overview of Sustainable Development Indicators 2006)*.Retrieved: <http://www2.meteo.lv/produkti/liaip2006/Ekonomika/produktivitete.htm#53>) Access: 28.12.2016
11. Latvian Environment, Geology and Meteorology Centre. (2012). *Nacionalais zinojums par vides stavokli - 2008. - 2011. (National Report on the Environment Condition 2008-2011)*.Retrieved: http://www2.meteo.lv/varam/2011/7a_salada/7pirmie.php Access: 28.12.2016
12. Latvian State Institute of Wood Chemistry. (2016). *Valsts petijumu programma 2014.10-4/VPP-6/6Meza un zemes dzilu resursu izpete, ilgtspejiga izmantosana – jauni produkti un tehnologijas (ResProd)(National Research*

Programme 2014.10-4/VPP-6 Forest and Earth Entrails Resources: Research and Sustainable Utilization – New Products and Technologies). Retrieved: <http://www.kki.lv/index.php?id=238> Access: 20.12.2016

13. Melbarde, V., Ore M. (2016). *Influencing Factors of Rural Areas Development: Vidzeme Region Case Analysis*. International Conference "New Challenges of Economic and Business Development – 2016: Society, Innovations and Collaborative Economy". Proceedings. University of Latvia, pp. 484-495.
14. Ministry of Environmental Protection and Regional Development of the Republic of Latvia. (2014). *Vides politikas pamatnostādnes 2014.–2020.gadam. (Informatīva daļa) (Guidelines for the State Environmental Policy 2014-2020. Informative Part)*. Retrieved: <http://www.varam.gov.lv/lat/pol/ppd/vide/?doc=17913> Access: 02.12.2016
15. Naldi, L., Nilsson, P., Westlund, H., Wixe, S. (2016). *What is Smart Rural Development?* Retrieved: <http://www.sciencedirect.com/science/article/pii/S0743016715300024> Access: 03.12.2016
16. Rone, M. (2016). *Sezonas ieguvums – rekordraža, graudu torni un noliktava (Seasonal Benefit: a Record Harvest, Grain Towers and Storage)*. Newspaper "Liesma", 18.02.2016, p. 5.
17. Saeima of the Republic of Latvia. (2010). *Latvijas ilgtspējīgas attīstības stratēģija līdz 2030.gadam (Sustainable Development Strategy of Latvia until 2030)*. Retrieved: http://www.pkc.gov.lv/images/LV2030/Latvija_2030.pdf Access: 10.12.2016
18. Seglins, V., Berzina-Cimdina, L., Sedmale, G., Svinka, R., Klavins, M., Muter, O. (2016). *Zemes dzīļu resursu izpēti- jauni produkti un tehnoloģijas (Zeme) (Studies of Mineral Resources- the New Products and Technologies (Earth))*. Retrieved: <http://www.lu.lv/vpp/posmu-rezultati/ii-posma-rezultati/> Access: 04.12.2016
19. State Regional Development Agency. (2009). *Latvijas pilsētu un lauku teritoriju mijiedarbības izvērtējums (Evaluation of Interaction Between Latvian Cities and Rural Areas)*. Retrieved: http://www.vraa.gov.lv/uploads/petnieciba/petijumi/Pilsetu_lauku_mijiedarbiba_GALA_Zinojums.pdf Access: 05.12.2016
20. State Regional Development Agency (2015). *Regional Development Indicators Module of Spatial Development Planning Information System*. Retrieved: <http://raim.gov.lv/cms/tiki-index.php?page=Home> Access: 21.12.2016
21. Vaidava Ceramics, Ltd. (2017). *Who we are?* Retrieved: <http://vaidava.lv/en/> Access: 11.01.2017
22. Vidzeme Planning Region. (2013) *Daba un resursi (Nature and Resources)*. Retrieved: http://www.vidzeme.lv/lv/daba_un_resursi Access: 14.12.2016
23. Vidzeme Planning Region. (2011). *Vidzemes ilgtermiņa attīstības scenāriju īstais ziņojums Vidzemes ilgtermiņa attīstības scenāriju īstais ziņojums (The Long-term Development Scenarios for Vidzeme. Short Report)*. Retrieved: http://www.vidzeme.lv/upload/Vidzemes_scenariju_istais_ziojums.pdf Access: 28.12.2016
24. Vidzeme Planning Region. (2014b). *Vidzemes planosanas reģiona attīstības programma 2015.–2020. (Vidzeme Planning Region Development Programme 2015-2020)*. Retrieved: http://www.vidzeme.lv/upload/Attstbas_programma_2015-2020.pdf Access: 29.12.2016
25. Vidzeme Planning Region. (2015). *Vidzemes planosanas reģiona ilgtspējīgas attīstības stratēģija 2030 (Sustainable Development Strategy for Vidzeme Planning Region 2030)*. Retrieved: http://jauna.vidzeme.lv/upload/VIDZEMES_PLANOSANAS_REGIONA_ILGTSPEJIGAS_ATTISTIBAS_STRATEGIJA.pdf Access: 28.12.2016
26. Vidzeme Planning Region. (2014a). *Vidzemes planosanas reģiona viedas specializācijas iespējas (Smart specialization possibilities of Vidzeme Planning Region)*. Retrieved: http://www.vidzeme.lv/lv/regionalie_petijumi/50/128234/ Access: 06.12.2016
27. Wunderkraut Latvia, Ltd. (2017). Retrieved: <http://www.wunder.lv/> Access: 12.01.2017

ETHNOLOGICAL EXPERTISE AS A TOOL OF THE IMPACT ASSESSMENT ON ARCTIC TERRITORIES OF TRADITIONAL LAND USE

Ivan Potravnyy¹, Dr.oec., professor; Tatjana Tambovceva², Dr.oec., professor and
Violetta Gassiy³, Dr.oec., associate professor

¹Plekhanov Russian University of Economics (Russia),

²Riga Technical University (Latvia), ³Kuban State University (Russia)

Abstract. Nowadays, the process of intensive industrial development of the Arctic territories is underway; it is connected with involvement of local natural resources into economic turnover and socio-economic development of these territories. At the same time, the Northern indigenous minorities establish and secure legislatively the territories of traditional land use with limited economic activity to protect their interests and rights, as well as to preserve their indigenous environment. In view of the fact that many mineral deposits and energy resource fields to some extent affect such territories, it is necessary to develop a mechanism to coordinate the interests of all stakeholders, including investors, producer companies, municipalities, the Northern indigenous minorities and their communities.

The aim of the paper is to analyse an application of ethnological expertise in assessment of positive and negative impacts of capital projects and to find out possible forms of compensation, which may offset these potential negative impacts on the indigenous environments and indigenous peoples. Sociological research approaches were used as one of the tools to identify the interests and needs of indigenous inhabitants at the zero-stage of the project. The paper presents the results of sociological research as the means for development of an interaction model among the stakeholders in commercial exploitation of the territories of traditional land use. The presented scientific methodology for ethnological expertise of capital projects in the Russian Arctic can be also used in other Arctic regions and countries, which might face conflict situations during development of natural resources in native habitats of the Northern indigenous minorities.

Key words: industrial development areas, sustainable development, indigenous community, Ethnological projects' expertise, traditional land use, Arctic.

JEL code: Q56, I310, R14

Introduction

At present, Russia is implementing a state policy directed at the development of natural resources and socio-economic development of the Arctic Region for the period until 2020 and beyond. In addition, the territory of the Far North is considered a strategic resource development base (Principles of State Policy in the Arctic for the period till 2020 and beyond, 2009).

The future of the Russian Arctic Region is obviously connected with the subsurface resource development, which in essence is a "drive" for modernization of the country's economy. However, in this respect, the issue of reconciling the interests of indigenous inhabitants of these territories (preservation of their culture, traditional land use etc.) with goals and objectives of the enterprises-subsoil users becomes extremely topical. That is why currently the mechanism of interaction between business and the Northern indigenous minorities in the matters related to commercial development of

the territories is being created, it will ensure coordination at all stages of project implementation, starting with the primary stage of public discussion, project approval, and in the course of conducting economic activities.

The aim of the paper is to analyse an application of ethnological expertise in assessment of positive and negative impacts of capital projects and to find out possible forms of compensation, which may offset these potential negative impacts on the indigenous environments and indigenous peoples. Sociological research approaches were used to identify the interests and needs of indigenous inhabitants.

Research results and discussion

1. Theoretical background

Indigenous people elsewhere are seeking recognition of their land and other rights. This is particularly true in New Zealand and Australia where the Maori and the Aborigines have rights and aspirations similar to indigenous people in Canada, but it is also found in Mexico, Central

²Corresponding author. Tel.: + 37129492724 E-mailaddress:Tatjana.Tambovceva@rtu.lv

and South America, Africa, Northern Europe, and Asia (Anderson, Dana & Dana, 2006).

Examples of implementation of the mechanisms for coordinating target group interests in the field of traditional land use can be found in the practice of commercial exploitation of the territory of the Republic of Sakha (Yakutia). In the territory of the region, a number of commercial development projects in the Arctic zone are currently at the stage of either feasibility studies, design or implementation, and these projects to a certain extent affect the interests of the Northern indigenous minorities in their traditional economic activities, for example:

- exploitation and mining of alluvial diamonds;
- mining of rare earth metals within the Tomtor Taas Deposit (Olenekian Evenkian National Region);
- search and exploration of oil and gas deposits, oil and gas flows in the Arctic zone of the territory of Olenekian Evenkian National Region (the estuary of the Olenek River) etc.

As shown by the analysis of modern Russian practice of commercial exploitation in the territories of compact settlement of indigenous inhabitants, insufficient consideration of their opinions, interests and needs, as well as of environmental and socio-economic factors (Sakhalin's offshore recovery, subsurface resource management projects in Yamalo-Nenets and Khanty-Mansi Autonomous Area etc.) might cause conflict of interests among the involved target groups (indigenous communities, public authorities, business etc.) (Klokov, Khrushchev & Bocharnikova, 2013).

Dealing with such situations, it is mandatory to establish appropriate regulatory framework for natural resource management regulating the interaction of subsurface resource producers with public authorities and indigenous communities pursuing their traditional livelihood. In this respect, the Republic of Sakha (Yakutia) is the pioneer in the field of legal regulation of traditional land use, and ethnological expertise is

widely used as one of its major tools. In accordance with the Federal Law No88-FZ "On Guarantees of the Rights of Indigenous Small-Numbered Peoples of the Russian Federation" of 30 April 1999, the Law of the Republic of Sakha (Yakutia) 820-3 No 537-IV "On Ethnological Expertise in Places of Traditional Habitat and Traditional Economic Activity of the Northern Indigenous Minorities of the Republic of Sakha (Yakutia)" of 14 April 2010, the Decree of the government of the Republic of Sakha (Yakutia) No428 of 6 September 2011, the Statement on the Procedure of Organization and Realization of Ethnological Expertise was approved. According to this document, the ethnological expertise shall finalize with the executive summary presenting conclusions on either inadmissibility or opportunity to conduct economic or any other kind of activity in the places of traditional habitat or activities of the Northern minorities. In other words, ethnological expertise is scientific research on the influence of the changes in the native habitats of indigenous minorities and the socio-cultural context on the development of a particular ethnos (Potravny & Baglaeva, 2015).

The issue of respecting the opinions of indigenous inhabitants in commercial exploitation of the territories of their compact settlement is inherently related to the issue of corporate social responsibility. That is why ethnological expertise should be considered not only as a tool to coordinate the interest of investors, local population and public authorities, but also as a way to exercise corporate social responsibility in the territory under industrial development (Gassiy, 2014). Analyzing the experience of the Republic of Sakha (Yakutia), it may be added that the concept of corporate social responsibility also implies consideration of opinions of the Northern indigenous minorities, which is possible only if an interaction mechanism for the subsurface resource producer and this target group is in place (Potravny, Gassiy & Tambovceva, 2016). Consequently, economic

exploitation of such territories should allow for design of effective, competitive and environmentally oriented model of their sustainable development, ensuring efficient and rational use and minimization of the damage to the environment based on social and economic assessments of anthropogenic impacts and their consideration in making investment decisions (Potravny, Gassiy & Umnov, 2016).

In order to receive feedback from the Northern indigenous minorities during feasibility studies and project implementation in the Arctic Region, the methods of sociological research were developed in the course of ethnological expertise of the planned activities.

Some of the results of industrial development of the territory may include not only plots of land, but also deer pastures, hunting areas, and water bodies, which ultimately results in deterioration of the livelihood of indigenous population, threatening the habitats of domestic deer, game mammals, game, fish and growing areas of berries, mushrooms and medicinal-technical plants. This potential impact of the project can have negative implications and may be manifested in deformation of distinctive livelihood, ethnicity and culture of the Northern indigenous peoples, which in its turn may result in gradual abandonment of their traditional lifestyle.

Some representatives of the Northern indigenous minorities and their communities adhere to a harder line, maintaining that modern industrialization destroys their unique culture that has formed throughout the centuries, the culture that is based on harmonic interaction between humans and fragile nature, and thus the existence of these indigenous peoples as an integral part of world civilization is threatened (Novoselov, Potrany, Novoselova & Gassiy, 2016). Indigenous inhabitants have trouble in adapting to changes of socio-economic environment; they are exposed to various risks related to industrial projects and socio-economic

reforms, including the risks of losing their identity, culture and traditional lifestyle, dissemination of diseases (Baisheva, 2012).

Daily life of indigenous population is closely connected with deer-breeding, hunting, fishing and harvesting of high-value wild-growing herbs. Certainly, implementation of industrial development projects in the territories of traditional land use to a certain extent influences the nature, traditional livelihood of the Northern indigenous minorities, their culture and lifestyle (Baisheva, 2014).

Still it cannot be unanimously stated that producers bring only destruction to indigenous environments, customary practices, and culture of the Northern indigenous minorities. Another important aspect that should be considered is how these companies contribute to socio-economic development of this territory, taking part in ensuring descent living conditions for indigenous minorities and preservation of their culture and language. People often hold a negative attitude towards a project, if there is a lack of information regarding the process of project implementation and potential results of territory development. If the company considers the wishes and requests of the Northern indigenous minorities in a competent and objective manner, it will be possible to implement the project successfully. Stated differently, it is important to develop a mechanism for coordination and harmonization of opposed, sometimes conflicting interests. For example, Klovov (2015) suggests new methodological approach for better evaluation of positive and negative results of rapid social changes in local communities of small-numbered ethnic groups in remote areas of Siberia.

Practical experience has shown that sometimes the Northern indigenous minorities put forward rather overstated demands of socio-economic character. These might refer to housing, roadways, infrastructure etc. Such requests are mainly conditioned by a quite

understandable wish of indigenous inhabitants and their communities to live better, to obtain real profit from exploitation of a certain territory. It should be also noted that previously the interests of native residents were not always taken into account.

Novikova (2016) concludes that what is required in the Russian North is full implementation of existing legislation and industrial companies' social together with environmental commitments, plus an integrated approach that takes into account local legal, ethno-cultural and historical practices, in addition to assessment by ethnological experts in the field of legal anthropology.

Effective legislation, including the legislation of the Republic of Sakha (Yakutia), namely, the law on ethnological expertise, determines the process and procedures of projects' conciliation. As a rule, project discussion commences with local public hearing. During the hearing, the concept of the project and suggestions are discussed, the opinions and interests of the stakeholders are considered. The interests may differ, of ten oppose. Young people want companies to provide employment opportunities and ensure training to obtain good professional qualification. The retired people, subject to state social security coverage, who receive regular, although modest income, can oppose some producer company's activities in the territory under discussion. Local public authorities expect investments in socio-economic and cultural development as well as look forward to tax revenues. At the same time, an investor – subsurface resource user – considers the options of territory exploitation in terms of development of one's own company.

Determining the damages to the Northern indigenous minorities in the area of project implementation, it is important to realize that many environmental goods used by local inhabitants do not always have a market value, as they are not sold in the open market, but

rather consumed by local inhabitants themselves (for instance, some berries, fish, wild plants etc.). In fact, in the conventional sense, such markets are only emerging in many territories of traditional land use in the Arctic zone (fish market, deer production market, market of wild harvest and medicinal raw materials, tourist market etc.). The question is how these goods can be considered in assessment of resource production potential of the territory and evaluation of the loss of expected gain, if these goods do not have a price tag.

Socio-economic status of native community members is aggravated by objective maladjustment of their lifestyle, and most of all, of the mental make-up, mentality of hunters and reindeer breeders to market transformations accompanied by commercialization of social and industrial relations. Recently, there has been an obvious shift in the life of indigenous inhabitants due to expansion of their field of activity to gathering and craftwork (gathering of wild berries, mushrooms, medicinal-technical herbs, handicrafts, manufacturing of souvenirs and house ware, tailoring of national costumes, development of ethnological tourism etc.).

2. Methodology

The present research was conducted in Yakutia in July 2015. In the course of research work, the experts travelled by airplanes, helicopters, motor boats, ATVs, and on foot. All local travels were accompanied by representatives of indigenous communities, local hunters and fishermen. The main task of this research was to collect the data for assessment of potential damage to indigenous environments and social and cultural development of the Northern indigenous minorities and their traditional land use from the planned economic activity of a subsurface resource producer in the ulus (local municipal community) territory. Ethnographic, demographic and socio-economic characteristics of territorial development were also studied. Results of the sociological survey

Table 1

Distribution of respondents by the type of employment

| Type of Employment | Number of respondents | % |
|------------------------|-----------------------|------|
| Employed | 75 | 45.5 |
| Unemployed | 30 | 18.2 |
| Temporarily unemployed | 21 | 12.7 |
| Retired | 26 | 15.8 |
| House wives | 6 | 3.6 |
| Students | 3 | 1.8 |
| Other | 4 | 2.4 |

Source: authors' calculations based on questionnaire results

Two respondents replied that they continue working being retired.

Table 2 shows distribution of the surveyed depending on the field of their activity and occupation.

Table 2

Distribution of respondents in the Zhilinda village by field of activity and occupation

| Field of activity | Number of respondents | % | |
|---|-----------------------|------|--|
| Public sector worker | 68 | 40.7 | 11 respondents combine work and traditional livelihood activities. |
| Entrepreneur or employee | 11 | 6.6 | |
| Traditional livelihood activities: hunting, reindeer breeding, fishing, wild harvesting | 67 | 40.1 | 25 people see livelihood activities as their main job. 42 people are engaged in traditional livelihood activities for themselves and their families. |
| No job | 11 | 6.6 | Lack of employment is evident among the retired people and temporarily unemployed. Their sources of income are pensions and state allowances. |
| Other | 10 | 6.0 | |

Source: authors' calculations based on questionnaire results

When it comes to social problems and preservation and development opportunities of

revealed the existing issues and optional vectors of interaction among all target groups (state authorities and municipalities, businesses, indigenous inhabitants and native communities).

Researchers applied house-to-house cluster sampling survey in the municipal community "Zhilinda national nasleg (local community)". The sample consisted of 167 people, including 81 men and 86 women. The sample included all legally capable citizens at the age of 18 and older, who were present in the territory in the zone of planned activities on the licensed plot of land at the time of the survey. Population of the settlement inhabited by indigenous minority the Evenks.

Face-to-face survey using questionnaires was chosen as a research method, whereupon respondents read questions on their own and chose one of the multiple choice options. Due to language problems and low level of education, some respondents needed assistance in filling in the questionnaire during the survey. However, it has not diminished the representativeness of survey sampling and quality of research.

The questionnaire included 22 questions. 11 questions were related to socio-demographic analysis of the population. Other questions were stated in accordance with the set research tasks. The questionnaire also comprised one open question, where respondents could provide additional information in their discretion. Each question offered an optional reply "other", providing the respondents the opportunity to give a reply in the free form. Four questions provided for unlimited number of replies.

3. Results

Qualitative analysis of the survey results has revealed a number of socio-economic problems hindering the development of the institution of the family. Thus, respondents highlighted the following issues: "lack of brides", "parenting issues" etc. Table 1 shows distribution of the surveyed by the type of employment.

traditional livelihood in the project impact territory, 40.1 % of the total number of respondents are involved in traditional livelihood activities: 14.97 % see traditional livelihood as the only and the main source of income. 25.2 % go hunting, fishing, and wild harvesting for personal consumption purposes.

Data analysis on the size and type of income shows that this kind of activity does not bring stable and constant income and does not improve the financial standing of indigenous inhabitants. Public sector employees reported on a more stable income and thus their living conditions proved to be more comfortable.

The largest proportion of people surveyed (35.93 %) noted that they receive low income. Traditional livelihood is characterized by them minimum level of income. Taking into consideration the final results of environmental expertise concerning the status of the traditional livelihood area, the decline of traditional livelihood activities and decrease in the level of material support may be forecasted.

The major environmental problems identified by local inhabitants during the sociological survey in the project impact area were:

- Reduction in the number of traditional livelihood specimens (reduction of the number of reindeers, fur animals, wild growing herbs etc.) – 76.6 %;
- Supply of high quality drinking water – 40.7 %;
- Lack of waste collection and re-cycling system – 33.5 %;
- Climate change – 29.3 %; and
- Other problems – 1.2 %.

Traditional livelihood activities are considered by respondents as secondary activities for individual consumption purposes (25.2 %), which is caused by the reduction in the number of reindeers, fur animals and wild growing herbs (specified in the list of environmental problems).

As the result of sociological survey, the main socio-economic and environmental problems

have been revealed in the project impact area (Table 3).

Table 3

Main socio-economic problems identified by indigenous inhabitants during the survey

| Problem | Proportion of the surveyed, % |
|--|-------------------------------|
| Poor work opportunities | 86.8 |
| Low income | 76.0 |
| High food prices | 77.8 |
| Lack of roads | 68.3 |
| Lack of development opportunities for young people | 63.5 |
| Low level of healthcare | 47.9 |
| Lack of access to education | 38.9 |
| Alcohol abuse | 32.9 |
| Increased morbidity and mortality | 25.1 |
| Crime | 11.4 |
| Other problems | 1.8 |

Source: authors' calculations based on questionnaire results

Table 4 shows expectations of the respondents with regard to the company's activities in the lands of traditional use.

Table 4

Expectations of respondents mentioned during the survey

| Expectations | % |
|--|------|
| Education and employment opportunities | 73.1 |
| Improvement of quality of life (growth of incomes, development of infrastructure etc.) | 67.1 |
| Support of traditional livelihood | 28.7 |
| Monetary compensation | 66.5 |
| Other | 5.4 |

Source: authors' calculations based on questionnaire results

Among possible forms of compensation to the Northern indigenous minorities in case of alluvial diamond mining from the given deposit, the respondents mention:

- -one-off payment (6.6 %);
- annual allowances throughout the entire period of economic activities in the licensed area (16.2 %);
- landscaping and public amenities in the settlement (3.6 %);

- construction and maintenance of agricultural facilities (reindeer breeding, fish processing etc.) (1.8 %);
- participation of the company in the integrated territory development (68.2 %);
- other (3.6 %).

In the course of sociological surveys it was found out that sometimes during consideration of projects native communities attempted to re-assign responsibility and financial costs for territorial development from state authorities (regional and local) to producer companies. As a result, producer companies conducting business activities in the territories of traditional land use are interested to establish the limits of permissible exemption of funds from their revenues for these purposes at the legislative level, for instance, by setting a proportion of profits deductible for socio-economic development of the territory (e.g. 10 % for diamond mining companies). Therefore, it will be clear how much the company is able to allocate for these purposes and what kind of facilities can be included into the list of requirements during project implementation.

Conducting such sociological research allows to develop measures for the financing of sustainable development of the traditional land use territories, including participation of the banking sector of the economy (Ganbat, Popova, & Potravnyy, 2016).

Conclusions, suggestions, recommendations

- 1) The conducted ethnological expertise of the projects of commercial exploitation of the territories of traditional land use in Yakutia has provided the basis for improvement and development of appropriate legislation.
- 2) To coordinate the interests of target groups it is suggested to sign cooperation agreements among producer companies, local public authorities, and native communities of the Northern indigenous minorities.

- 3) Such cooperation could be guaranteed by establishment of regional traditional land use development funds, which would be used as a pool for contributions of producer companies aimed at development of these territories. Signing of such agreements has already been practiced by diamond mining companies Nizhne-Lenskoe JSC and Almazi Anabara JSC, members of ALROSA group.
- 4) For the purposes of ethnological expertise and evaluation of the damage to the Northern indigenous minorities applied to the surveyed territories, Yakutia in particular, it is necessary to develop local economic regulations for evaluation of natural goods, ecosystem services of natural capital, which could be used for evaluation of the damage.
- 5) The procedure and the mechanism for allocation of funds received as a compensation for damage to the Northern indigenous minorities should be improved. It is essential to ensure that all parties, which in some way or another are involved in project implementation, receive compensation and benefit from it. These parties include native communities, public sector employees, the retired, and the population of other territories of the ulus.

Listening to indigenous peoples on the basis of sociological surveys in the Arctic allows more qualitatively drawing the ethnological expertise conclusions of industrial development projects of the territory as well as the directions of local residents' cooperation with companies engaged in fields' development, including the programs of social and environmental responsibility of business. (Potravny, Gassiy, Chernogradskiy & Postnikov, 2016).

Acknowledgment

The present research has been supported by the Russian Humanitarian Foundation, project No. 17-02-00214

Bibliography

1. Anderson, R.B., Dana, L.P., Dana, T.E. (2006). Indigenous Land Rights, Entrepreneurship, and Economic Development in Canada: "Opting-in" to the global economy. *Journal of World Business*, 41, pp. 45–55.
2. Baisheva, S. (2014). National Daily Life Settlements Yakutii in the Context of Sociological Research // *Arctic and North*, № 14, pp.1-15 (in Russian).
3. Baisheva, S. (2012). The Main Problems of the Indigenous Peoples of the Republic of Sakha (Yakutia) in Terms of Socio-Cultural Modernization: the Shear Zone // *Russian Studies: Institute for Russian, East European and Eurasian Studies (IREEES) at Seoul National University, Seoul, Korea*. pp. 343 386.
4. Gassiy, V.V. (2014). Regional Aspects of the Formation Mechanisms of Social Responsibility. - Moscow: Economics. - 179 p. (in Russian).
5. Gassiy, V.V., Potravnaya, E.V., Kuznetsov, I.V., Zakharov, S.A. (2016). Harmonization of Interests of Target Groups in the Sphere of Subsoil Use: the Socio-economic, Environmental and Ethnologic Aspects. *Nedropolzovanie XXI vek*, vol. 2 (59), April. – pp. 90-97 (in Russian).
6. Khaliun Ganbat, Inessa Popova, Ivan Potravnyy (2016). Impact Investment of Project Financing: Opportunity for Banks to Participate in Supporting Green Economy. *Baltic Journal of Real Estate Economics and Construction Management*, November, 4, pp. 69–83.
7. Klokov, K.B. (2015). Methodological Principles of Ethnic Minority Life Conditions Assessment. *Revista Romaneascapentru Educatie Multidimensionala*, vol.7 (1), pp. 105-116.
8. Klokov, K.B., Khrushchev, S.A., Bocharnikova, A.S. (2013). Ethnoecological Assessment of the Impact of Industrial Development of the Traditional Natural Management of Indigenous Peoples of the North: Theoretical and Methodological Approaches // *Regional Research of Russia*, vol. 3 (2), pp.182-186.
9. Novikova, N.I. (2016). Who is Responsible for the Russian Arctic? Co-operation between Indigenous Peoples and Industrial Companies in the Context of Legal Pluralism. *Energy Research and Social Science*, 16, pp.98-110.
10. Novoselov, A., Potravny, I., Novoselova, I., Gassiy, V. (2016). Conflicts Management in Natural Resources Use and Environment Protection on the Regional Level. *Journal of Environmental Management and Tourism: ASERS Publishing*. – Vol. 7, No 3 (15), pp. 407-415.
11. Potravny, I.M., Kalavry, T.Yu., Larin, A.S. (2013). Analysis of Influence of Large-scale Projects in the Field of Nature Management: Ecological and Social Aspects, *ECO*, 11, pp. 145-158. (in Russian).
12. Potravny, I.M., Gassiy, V.V., Chernogradskiy, V.N., Postnikov, A.V. (2016). Corporate Social Responsibility in the Territories of Traditional Land Use as the Basis of the Partnership between Government, Business and Indigenous Peoples// *Arctic: ecology and economy*, 2, pp. 56-63. (in Russian).
13. Potravny, I.M., Gassiy, V.V., Tambovceva, T. (2016). Ethnological Examination as a Tool for Coordination of Interests of Target Groups in the Field of Traditional Nature Use. *Environmental economics*, №3, pp. 80-92 (in Russian).
14. Potravny Ivan, Gassiy Violetta, Umnov Vitaly (2016). Social and Environmental Factors of Project Justification for Arctic Development: Procedures and Methods of Accounting. 3rd International Multidisciplinary Scientific Conference on Social Sciences and Arts. SGEM 2016. Political Sciences, Finance, Economics and Tourism. Conference Proceedings. Volume IV. Economics and Tourism. Sofia, Bulgaria, pp. 581-585.
15. Potravny, I.M., Baglaeva, V.O. (2015). On Integrating the Objectives of Environmental Audit and Ethnological Expertise in the Study of Projects of Economic Development of the Territory. *Horizons of Economics. Research and analytical Journal*, vol. 5 (24), pp. 44-47 (in Russian).
16. Principles of State Policy of the Russian Federation in the Arctic for the Period till 2020 and beyond. Approved by the President of the Russian Federation of September 18, 2008 // Russian newspaper Metropolitan Edition, 2009, March 27 <http://www.rg.ru/2009/03/30/arktika-osnovy-dok.html>

DEMAND FOR AND SUPPLY OF HIGHER EDUCATION IN LATVIA

Aija Sannikova¹, Dr.oec., Tamara Grizane², Dr.oec., Aina Dobele³, Dr.oec.

¹University of Economics and Culture, ²School of Business Administration Turība, ³Latvia University of Agriculture

Abstract. An increase in the education level of the population is an important factor contributing to socio-economic development in regions, while the availability of human resources with higher education influences the regions both directly and indirectly. The research problem relates to the fact that demographic trends and socio-economic factors in Latvia contribute to changes in the quantitative demand for higher education at ISCED levels 5-8. The research has found that in Latvia the demand for undergraduate higher education (ISCED 5-6) is statistically significantly influenced by changes in the number of the working-age population, the number of students who are able to pay their tuition fees, gross domestic product in real prices per employee and average income per capita in cities, while such factors as GDP per capita, average net wage and salary income and average household income per capita in rural areas are statistically insignificant. The supply of higher education at ISCED levels 6-8 prevails in the total supply, while the supply of college education (ISCED 5) by the public and private sectors is underdeveloped outside Riga planning region.

Key words: demand for higher education, higher education infrastructure, wages and salaries, region.

JEL code: D02, H52, I21

Introduction

Quantitative changes in the demand for and supply of higher education in the knowledge services market take place in Latvia. The political priority to increase the number of students in higher education is inconsistent with the real situation in Latvia, as the number of residents in higher education decreases, and this is influenced by the on-going demographic and socio-economic processes. Higher education infrastructure in terms of number of educational institutions is concentrated in Riga region, while the supply of first level higher education is underdeveloped outside Riga region.

Research object: higher education.

Research aim: to identify and analyse changes in the demand for higher education and in the supply of higher education infrastructure in Latvia.

Research tasks

- 1) To examine theoretical findings on the role of higher education in the economy and society;
- 2) To analyse and assess the demand for higher education and the higher education infrastructure in Latvia and the regions.

Research methods

The research employed qualitative methods for theoretical literature review, while numerical

data were processed using statistical analysis and multifactor regression analysis.

Theoretical background Role of higher education in society

The influence of higher education on the economy and society is being extensively discussed in the public and scientific space. Such discussions mainly focus on two aspects: direct and indirect effects on the economy and society. The direct economic effects of higher education involve such categories as productivity, consumption and tax revenue (Yao Yao, 2015; Jarvis, Darryl S.L., 2014; Latvijas Universitāšu asociācija, 2012; Library House, 2005; Aleksejeva L., 2011), which increase with the number of employees engaged in higher education and the number of employees with higher education rising in a region.

The availability of highly qualified specialists in the work environment increases opportunities for the commercialisation of new knowledge and is an essential aspect of influence of higher education. The availability of such specialists in the national economy and the components of knowledge quality are appreciated by the government and the labour market, but in any case the direct buyer of knowledge in the knowledge market is a student whose demand for higher education does not depend on political

priorities but is the wish of the particular individual to sell the acquired knowledge in future at a high price (Sannikova A., 2014). Knowledge is formed in multifaceted institutional processes (Warhust Cr., Thompson P., 2012); therefore, there should be an opportunity in the regions to acquire sequential higher education at all its levels.

A few economists are sceptical about the widespread modern view that the problems of economic efficiency and social justice could be solved by means of highly qualified labour and high paid jobs (Brown, Ph., Lauder H., 2012). Besides, the entry of higher education specialists into the national economy in regions does not create equal economic returns and depends on a region's economic development stage (Sannikova A., Dobele A., Dobele M., 2015), which can cause discussions about the usefulness of an increase in the number of higher education specialists. There is also a critical view of the role of higher education in regions, which suggests that the use of higher education-related data in the context of a region's socio-economic characteristics is a way how higher education institutions and education as an industry of the economy try to attract more funds for their development.

However, most economists are of the opinion that positive changes in education contribute to tackling economic and social problems and reducing inequality among countries, regions and individuals (Rubinson R., Browne I., 1994), while the quality of labour may not be separated from the individuals' participation in education. At individual level, acquiring higher education influences the status of the individuals in the social stratification (Mensikovs V., 2007), creates favourable conditions for reaching a higher standard of life and for their competitive advantages in the labour market (Kassalis I., 2010) and contributes to employment as well as promotes the individuals' adaptation to new socio-economic circumstances, which is an indirect effect of higher education. The indirect

effect manifests itself as social solidarity and increase in political participation (Library Hause, 2005), economic activity and crime reduction.

Politically, the strategy Europe 2020, which is an EU strategy for growth for the next decade, sets three interdependent priorities: smart growth, which is based on knowledge and innovation, and sustainable and inclusive growth (Eiropas komisija, 2016). Every Member State's strategy sets national-level targets in every particular area of the strategy. Latvia has made a commitment to achieve a target of 30-34 % of 30-34-year-olds with higher education (LR Labklajibas ministrija, 2010), which is lower than the EU headline target indicator (40 %) for ISCED levels 5-6 (Parresoru koordinacijas centrs, 2015). Latvia's target for higher education is consistent with its domestic political priorities that have been defined in Latvia's Sustainable Development Strategy until 2030 in the field of higher education – 40 % of individuals aged 30-34 should have higher education – and evidences political support for higher education in the Member States as a driving factor for socio-economic development.

Developed higher education, which is characterised by the population's education level and the supply of higher education, builds up human resources and raises regional competitiveness (Porter M., 2003; Judrupa I., Senfelde M., 2011), contributes to regional entrepreneurship and provides the transfer of scientific discoveries, knowledge and technologies, thereby fostering regional development. The percentage of residents with higher education increased in Latvia – in 2015, 27.0 % of 15-74-year-olds had higher education, which, compared with 2010, was an 11.0 %-point increase. However, a further increase in this indicator could be hindered by a decrease in the population's incomes, a mismatch between the educational programmes offered and the specifics of regions and the labour market needs, as well as the unavailability of education

infrastructure in a part of the country's territory (LR Ekonomikas ministrija, 2011).

In Latvia, most of the students in higher education are Latvia's residents. Higher education, attracting foreign students, makes a direct contribution to Latvia's national economy. Foreign students studying in Latvia pay higher tuition fees, cover other expenses related to their studies and indirectly promote the development of tourism in the country owing to the students' social and family ties. However, only 42 % of foreign students are satisfied with their studies in Latvia, which indicates that the supply of higher education in Latvia has to be improved qualitatively and quantitatively (Domnica Certus, 2016).

In view of the fact that the higher the education level of individuals is, the higher the average hourly pay and the average monthly wage and salary are earned by them, it is more economically efficient for the country to contribute to increase in the number of residents with higher education, as it results in increases in tax revenues and GDP. The number of 15-74-year-old employees with higher education in Latvia increased from 31.1 % in 2010 to 35.1 % in 2015. However, the problem is that the number of residents decreased by 16.6 % in 2015 compared with 2000, which could decrease the quantitative demand for higher education in the knowledge services market and the supply of employees in the labour market. For this reason, the factors that promote the demand for higher education and the factors that hinder or do not influence it have to be analysed in order to maintain the demand for higher education in the national economy in the future.

Research results and discussion

Latvia's territory corresponds to the NUTS 2 classification, while the country's planning regions and statistical regions – to the NUTS 3 classification; accordingly, the present research analyses the demand for and supply of higher education in Latvia as a whole and by region.

The supply of higher education in Latvia may be classified as undergraduate studies (ISCED levels 5-6) and graduate studies (ISCED levels 7-8).

The demand for higher education at undergraduate level (ISCED 5-6) increased in Latvia in the period 2005-2007, while in the period 2008-2015 it was variable (LR IZM, 2015). In 2015, 84282 students studied at higher education institutions at undergraduate and graduate levels (ISCED 5-8) in Latvia (Table 1). Most students (81.72 %) studied in Riga region, while the smallest numbers were reported in Vidzeme region (1.03 %) and Pieriga region (1.58 %). In 2015, 83.31 % of the total number of students in higher education in Latvia studied in Riga planning region, which included the statistical regions of Riga and Pieriga, while the remaining students (16.69 %) studied in the other planning regions (which matched the statistical regions).

The concentration of students in Latvia's capital city does not contribute to balanced economic effects of higher education as a segment of the education industry on the development of Latvia's regions just because the engagement of labour in higher education, which depends on the number of students and the supply of study programmes at educational institutions, in Riga region is higher than in the other regions.

College education (ISCED 5) may be acquired in Latvia within 2-3 years, which is consistent with the target set in the strategy Europe 2020 to reduce the duration of studies for some student groups. However, despite the low total cost of acquiring this kind of education, the demand for college education in Latvia was low in both 2010 and 2015 (12.79 % of the total students in higher education in 2015), compared with studies at ISCED level 6 (Table 1).

Number and percentage of students at universities and colleges in the regions of Latvia in 2010 and 2015

| No | Region | Number* of students (ISCED 5-8) at public educational institutions | | | | Number* of students (ISCED 5-8) at private educational institutions | | | | N | % |
|-------------|--------|--|-------|----------|-------|---|-------|----------|-----|---------|--------|
| | | Universities | | Colleges | | Universities | | Colleges | | | |
| | | N | %* | N | %* | N | %* | N | %* | | |
| 2010 | | | | | | | | | | | |
| 1 | R | 48373 | 72.52 | 4639 | 58.37 | 24967 | 98.06 | 4918 | 100 | 81908 | 79.01 |
| 2 | PR | - | - | 1287 | 16.19 | 495 | 1.94 | - | - | 1 782 | 1.72 |
| 3 | K | 4839 | 7.41 | 991 | 12.47 | - | - | - | - | 5 830 | 5.62 |
| 4 | Z | 6108 | 9.35 | 308 | 3.88 | - | - | - | - | 6 416 | 6.19 |
| 5 | V | 1313 | 2.01 | - | 0.00 | - | - | - | - | 1 313 | 1.27 |
| 6 | L | 5697 | 8.72 | 723 | 9.10 | - | - | - | - | 723 | 6.19 |
| 7 | Total | 65341 | 100 | 7948 | 100 | 25462 | 100 | 4918 | 100 | 103 669 | 100 |
| 2015 | | | | | | | | | | | |
| 8 | R | 44521 | 78.07 | 3841 | 58.21 | 16336 | 99.14 | 4179 | 100 | 68877 | 81.72 |
| 9 | PR | - | - | 1194 | 18.09 | 141 | 0.86 | - | - | 1335 | 1.58 |
| 10 | K | 3261 | 5.72 | 760 | 11.52 | - | - | - | - | 4021 | 4.77 |
| 11 | Z | 4353 | 7.63 | 196 | 2.97 | - | - | - | - | 4549 | 5.40 |
| 12 | V | 867 | 1.52 | - | - | - | - | - | - | 867 | 1.03 |
| 13 | L | 4025 | 7.06 | 608 | 9.21 | - | - | - | - | 4633 | 5.50 |
| 14 | Total | 57027 | 100 | 6599 | 100 | 16477 | 100 | 4179 | 100 | 84282 | 100 |
| 15 | DF | -8314 | - | -1349 | - | -8985 | - | -739 | - | -19 387 | -18.70 |

Designations: N- Number; R- Riga region; PR – Pierīga region; K- Kurzeme region; Z- Zemgale region; V- Vidzeme region; L- Latgale region; %* - number of students as a % of the total number of the group; DF – difference in the number of students between 2015 and 2010, number

Source: authors' calculations based on LR IZM, 2015

The calculations (Table 1) allowed concluding that in Latvia:

- the demand for long-term studies at higher education levels (ISCED 6-8) was the highest;
- the demand for higher education at lower levels (ISCED 5-8) declined both at public and private higher education institutions.

Most of the demand for higher education (ISCED 5-8) is made up of the demand for it by Latvia's residents, while a small share of the demand is comprised by foreign students who mainly concentrate in Riga region. Although the percentage of foreign students at Latvia's higher education institutions rose by 7.0 %-points in 2015 compared with 2008, yet their total number in 2015 was not large – 2918, and the percentage of this student group was not greater than that in 2000 (8 %). Besides, the real number of foreign students decreased in 2015 compared with 2000 (by 1418 or 18 %), while no

decrease in higher education infrastructure was reported. The number of individuals employed in higher education did not decline; on the contrary, the number of individuals at the main job, including those with a scientific degree, increased (Table 2).

Table 2

Change in the number and percentage of personnel in higher education in Latvia in 2015 compared with 2000 and 2010

| No | Group | Change 2015/2000* | | Change 2015/2010** | |
|----|-------|-------------------|-------|--------------------|-------|
| | | N | % | N | % |
| 1. | PM | 924 | 23.18 | 194 | 4.11 |
| 2. | ZG | 968 | 49.64 | 751 | 34.66 |

Designations: PM- personnel at the main job; ZG – personnel with a scientific degree; N- Number; 2015/2000* - change in the number and proportion of personnel in 2015, compared with 2000; 2015/2010** - change in the number and proportion of personnel in 2015, compared with 2010

Source: authors' calculations based on LR IZM, 2015

One can conclude that the higher education attractiveness increase in the composition of personnel is not the only factor that affects the

exports of higher education services. Strategic support by the government is necessary, as studies show that the current government support is insignificant in this area (Domnica Centus, 2016) despite the fact that higher education exports are an important segment of the national economy.

In 2010 and 2015, the supply of higher education in Latvia was provided by 56 public and private universities and colleges and two foreign university affiliates.

In 2015 compared with 2010, changes in the number of higher education institutions were observed only in Riga region where their number increased by one such institution and in Latgale region where there was a decrease by one institution. In 2010 and 2015, Riga region's universities and colleges met most of the demand for higher education in Latvia; besides, there was an increase in the demand (2.71 %). In the other regions of Latvia, the quantitative demand for higher education decreased (-2.62 %) in 2015 compared with 2010, which indicated a decrease in the influence of Latvia's regions (except Riga region) on the economy.

A distinctive feature of Latvia's higher education infrastructure is the lack colleges founded by legal entities in the regions of Kurzeme, Zemgale, Vidzeme and Latgale and the lack of colleges in Vidzeme region (Table 3).

The demand for undergraduate higher education by Latvia's residents is shaped by individuals who have graduated from secondary schools and are aged 17-19 and older. However, given the available data of the Central Statistical Bureau on demographic and socio-economic processes and of the Ministry of Education and

Science on education, as well as the incompatibility of the data in respect to their division by age group, the data were recalculated for the following age groups: 15-24, 25-39 and 39-64 for the purpose of an examination of changes in the demand for higher education by age group.

Calculations were performed to identify the changes for the working-age groups as well as a related trend was identified, which was possible because the time series yielded a long-term trend and trend models could be employed to make necessary forecasts. The examination revealed that the number of residents decreased across all the working-age groups in Latvia in the period 2010-2015:

- 3) the decrease in the number of residents for the age group 15-24 showed a linear trend ($R^2=0.9955$):

$$y=-17424x+314206 \quad (1)$$

- 4) the decrease in the number of residents for the age group 25-39 was described by a quadratic equation ($R^2=0.8091$):

$$y=-11886x^2+57433x+375907 \quad (2)$$

- 5) the decrease in the number of residents for the age group 39-64 also had a linear trend ($R^2=0.9506$):

$$y=-3224x+702201 \quad (3)$$

where:

x - periods ($x=t+n$), R - determination coefficient.

The decreases in the working-age population as a whole and across the above-mentioned age groups (LR VARAM, 2010; LR CSP, 2016) in Latvia can influence the demand for higher education by these age groups.

Higher education infrastructure and the number and percentage of students in higher education in Latvia's regions in 2010 and 2015

| No | Region | 2010 | | | | | 2015 | | | | | 2015/2010 |
|----|--------|----------------|---|-----------------|---|-------|----------------|---|-----------------|---|-------|-----------|
| | | Public, number | | Private, number | | %* | Public, number | | Private, number | | %* | |
| | | A | K | A | K | | A | K | A | K | | |
| 1. | R | 10 | 8 | 14 | 7 | 79.01 | 10 | 9 | 12 | 9 | 81.72 | 2.71 |
| 2. | PR | - | 3 | 1 | - | 1.72 | - | 3 | 1 | - | 1.58 | -0.14 |
| 3. | K | 3 | 1 | - | - | 5.62 | 3 | 1 | - | - | 4.77 | -0.85 |
| 4. | Z | 1 | 1 | - | - | 6.19 | 1 | 1 | - | - | 5.40 | -0.79 |
| 5. | V | 1 | - | - | - | 1.27 | 1 | - | - | - | 1.03 | -0.24 |
| 6. | L | 2 | 4 | - | - | 6.19 | 2 | 3 | - | - | 5.50 | -0.60 |

Designations: Private – number of universities and colleges founded by legal entities; public – number of universities and colleges founded by the government; R- Riga region; PR – Pieriga region; K- Kurzeme region; Z- Zemgale region; V- Vidzeme region; L- Latgale region; A- universities, K- colleges, 2015/1010 – change in the number of students in 2015, compared with 2010, %; %* – number of students as a % of total; 2015/2010 – change in the number of students in 2015, compared with 2010, %-points

Source: authors' calculations based on LR IZM, 2015

Table 4

Demand for higher education by age groups in Latvia in 2010-2015, % and number

| No | Age group | Percentage of students (ISCED 5-8) in the age group, % | | | | | | Change in the number of students, 2015/2010 | |
|----|-----------|--|-------|-------|-------|-------|-------|---|--------|
| | | | | | | | | Number | % |
| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | | |
| 1. | 15-24 | 22.62 | 23.12 | 23.39 | 23.26 | 23.11 | 23.26 | -18409 | -27,15 |
| 2. | 25-39 | 6.47 | 6.26 | 6.54 | 6.67 | 6.90 | 7.21 | 1227 | 4.33 |
| 3. | 39-64 | 1.10 | 0.88 | 0.90 | 0.76 | 0.75 | 0.78 | -2318 | -30.28 |

Source: authors' calculations based on LR IZM, 2015

Nevertheless, the present research found that in Latvia in the period 2011-2015, the changes in the demand for higher education were not equal (as a % of the total number of the group) across the age groups of 15-24, 25-39 and 39-64 (Table 4):

- positive changes in the demand for higher education were observed for the age groups of 15-24 and 25-39 – the proportion of both groups rose by 0.74 %-points in 2015 compared with 2010;
- a small but negative change in the trend was identified for the age group 39-64 old ones – their proportion in the total number of students decreased by 0.32 %-points in 2015 compared with 2010.

However, despite the increase in the proportion of the age group 15-24 with regard to the demand for higher education, the real number of students aged 15-24 decreased by

27.15 % in 2015 compared with 2010 (Table 4). The number of students aged 25-39 increased by 4.33 %, whereas the number of those aged 39-64 decreased by 30.28 % in 2015 compared with 2010.

According to CSB data (LR CSP, 2016), the labour market demand for human resources with higher education increased in 2015. If individuals acquire a higher level of education, the wages and salaries of the employed individuals increase in all the industries of the economy.

Nevertheless, the average wage and salary for employees with higher education was not equal across all the age groups in 2014. At ISCED levels 5-8, the average wage and salary for the age group 30-39 was considerably higher than for the age group 20-29.

However, there were differences in the average maximum wage and salary among the age groups (LR CSP, 2016): higher average

hourly wages were earned by individuals with a doctor's degree (EUR 10.20) at the age of 50-59 years and those with a master's degree (EUR 7.35), level 1 higher education (EUR 5.16) and a bachelors' degree (EUR 5.97) at the age of 30-39. At an older age, the mentioned age groups earned lower average hourly wages.

The present research allows concluding that:

- in the labour market, higher education level knowledge is bought at a higher price;
- if acquiring higher education at OECD level 6 earlier, it contributes to a greater increase in wages and salaries, and this explains the low demand for college education in Latvia;
- an increase in the participation of the age group 25-39 in higher education, acquiring a higher level knowledge, is in line with the increase in labour costs for this age group.

A research study on factors hindering individuals from participation in higher education in Latvia found that:

- in 2014, wages and salaries for employees being participants in higher education in the following industries: education (P), arts, entertainment and recreation (R) and accommodation and food service activities (I) were two times lower than in financial and insurance activities (K) and almost 1.5 times lower than in the entire economy;
- wages and salaries in the national economy were diverse – not always higher education level knowledge (according to the OECD classification) resulted in higher earnings. The average wage or salary income (EUR 927) for an individual with a doctor's degree engaged in construction (F) in 2014 could be mentioned as an example – the income was even lower than for those with first level higher education who worked in manufacturing (EUR 948).

This fact shows that pay may be both a promoting and a hindering factor for the demand for higher level knowledge.

The demand for education by households is influenced by the industry the household members are engaged in and their age group, at least because these factors influence their economic ability to cover the costs related to the acquisition of their education. In the period 1998-2015 in Latvia, according to data of the Ministry of Education and Science (LR IZM, 2015), the number of students in undergraduate studies, which result in acquiring a bachelor's degree or level 1 higher education, who covered their studying costs by their private funds was greater than the number of those whose costs were cover by government funding. Even though the number of students covering their costs by their private funds decreased in recent years (in 2012-2015), yet their percentage was still high – 58 % of the total undergraduate students in 2015 (compared with 2010, it was a decrease by 5 %-points).

An essential aspect in the demand for higher education could be whether households live in a city or in rural areas, as the average income per household member in cities was higher than in rural areas in the period 2010-2015 (LR CSP, 2016).

The present research has found that the demand for higher education could be influenced by the number of working-age residents as well as economic factors that affect the residents' ability to participate in higher education and cover their studying costs. To statistically verify the mentioned finding and determine the influence of the factors on the demand for higher education in Latvia, calculations were performed employing multifactor regression analysis, and the results acquired were tested for multicollinearity. To technically perform a regression analysis, the backward elimination method was chosen in order to exclude statistically insignificant factors from the model and the stepwise elimination method was chosen, which is the most widespread method employed in multifactor regression analysis and allows

consecutively including the variables examined in a regression equation.

Since the backward elimination method yielded better results in terms of p-value, the equation for the demand for undergraduate higher education (the variable) was based on the results acquired by this method:

$$y = -30985.216 + 0.024x_1 + 1.067x_2 - 0.0658x_3 - 38.155x_4 \quad (4)$$

where:

y – demand for undergraduate higher education, the number of students; x_1 – number of working-age residents; x_2 – number of students covering their studying costs by their private funds; x_3 – GDP per employee, EUR; x_4 – average household income per member in cities, EUR.

The parameters of Equation 4 were as follows: $n=11$, $R^2=0.996$, $F=236.074$, $p=0.000$. The regression model included statistically significant factors ($p<0.05$) and excluded statistically insignificant variables: GDP per capita (x_5 ; $p=0.074$), average net wage and salary in Latvia, EUR (x_6 ; $p=0.055$) and average household income per member in rural areas (x_6 ; $p=0.061$).

The regression equation (4) allows concluding that the number of students in higher education could increase with the numbers of working-age residents and households that can cover their higher education tuition fees by their private funds rising. In contrast, change in GDP per employee and change in the average household income per member in cities are the factors that do not contribute to an increase in the number of students, which might be explained by a considerable increase in (direct and indirect

studying costs, insignificant changes in household incomes, changes in the employment rate and disparities among Latvia's regions.

Conclusions

- The role of higher education is extensively researched by scientists, and, at regional level, it is mainly associated with the effects of increase in productivity in the national economy, consumption and tax revenue;
- in Latvia, the demand for higher education by the age groups of 15-24, 25-39 and 39-64, as a percentage of the total number of the group, changed insignificantly; however, due to the negative demographic trends, the number of students at public and private universities and colleges decreased by 18.70 % in 2015 compared with 2010, which was determined by the decrease in the numbers of students in higher education in the age groups of 15-24 and 39-64;
- the multifactor regression analysis showed that the demand for undergraduate higher education is statistically significantly influenced by such factors as the number of working-age residents, the number of students who can cover their higher education tuition fees by their private funds, GDP per employee and average household income per member in cities;
- Latvia's higher education infrastructure has little changed in 2015 compared with 2010, while the supply of college education in Latvia's regions is insignificant and there is no supply of this kind of education at all in Vidzeme region.

Bibliography

1. Aleksejeva L. (2014). Latvijas augstakas izglitibas sistemas efektivitates izpete (Efficiency of the Higher Education System of Latvia). GlobeEdit, p. 180.
2. Brown Ph., Lauder H. (2012) Globalization, Knowledge, and the Myth of the Magnet Economy. In: "The Knowledge Economy and Lifelong Learning: A Critical Reader". D.W.Livingstone, D.Guile (Eds.). Rotterdam: Sense Publishers, p. 117-146.
3. Domnica Certus (2016). Augstakas izglitibas eksporta ekonomiska nozime un ietekme Latvija (Economic Significance and Effects of Higher Education Exports in Latvia). Retrieved: http://certusdomnica.lv/wp-content/uploads/2016/05/Certus_AugstakasIzglitibasPolitikasParskats_2016.pdf. Access: 07.01.2017.
4. Eiropas komisija (2016). "Eiropa 2020" merki (Targets of Europe 2020). Retrieved: http://ec.europa.eu/europe2020/targets/eu-targets/index_lv.htm. Access: 09.08.2016.

5. Jarvis, Darryl S.L. (2014). Regulating Higher Education: Quality Assurance and Neo-liberal Managerialism in Higher Education—A Critical Introduction. In "Policy and Society, Vol. 33, Issue 3, pp. 155-166. Retrieved: http://www.darryljarvis.com/uploads/2/2/6/9/22690064/publication_2_revised.pdf. Access: 01.04.2015.
6. Judrupa I., Senfelde M. (2011). Konkuretspejas novertesana Latvijas planosanas regionos. No: "Ekonomika un uzņemejdarbība" (Assessment of Competitiveness in the Planning Regions of Latvia. In: "Economy and Entrepreneurship"), No. 21, pp. 50-59. Retrieved: file:///C:/Users/aija/Downloads/pub12508 %20(1).pdf. Access: 29.12.2016.
7. Latvijas Universitatu asociacija (2012). Universitatu ieguldījums Latvijas tautsaimniecībā. Kopsavilkums (Contribution of Universities to the national Economy of Latvia. Summary). Retrieved: http://www.lu.lv/fileadmin/user_upload/lu_portal/par/strukturvienibas-un-infrastruktura/saist/lu/LUA_kopsavilkums_Augstaka_izglitiba.pdf. Access: 15.12.2016.
8. Library House (2005). The Impact of the University of Cambridge on the UK Economy and Society. Library House, Cambridge, UK. Retrieved: http://www2.warwick.ac.uk/research/warwickcommission/chancellorscommission/resources/secondary_research/the_impact_of_the_university_of_cambridge_on_the_uk_economy_and_society.pdf. Access: 24.07.2016.
9. LR CSP (2016). Statistikas datubāze (Statistics Database). Retrieved: <http://www.csb.gov.lv/dati/statistikas-datubazes-28270.html>. Access: 11.11.2016.
10. LR Ekonomikas ministrija (2011). Latvijas nacionālās reformu programmas „ES 2020” stratēģijas īstenošana (National Reform Programme for the Implementation of the Europe 2020 Strategy). Retrieved: http://www.lm.gov.lv/upload/darba_tirgus/darba_tirgus/es_2020_vers2.pdf. Access: 23.09.2016.
11. LR IZM (2015). Statistika par augstāko izglītību (Statistics on Higher Education). Retrieved: <http://www.izm.gov.lv/lv/publikacijas-un-statistika/statistika-par-izglitibu/statistika-par-augstako-izglitibu>. Access: 19.10.2016.
12. LR VARAM (2010). Reģionu attīstība Latvija (Regional Development in Latvia). Retrieved: http://www.vraa.gov.lv/uploads/Regionu_attistiba_Latvija_2010_web_LAT.pdf. Access: 07.10.2016.
13. Mensikovs V. (2007) Izglītības paradigma un sociālais dialogs (Educational Paradigm and social Dialogue). No: *Izglītība zināšanu sabiedrības attīstībai Latvijā (Education for the knowledge Society the Development of Latvia)*. Rīga: Zinātne, pp.35- 51.
14. Pārresoru koordinācijas centrs (2015). Indikatori 2015. gada Latvijas ilgtspējīgas attīstības stratēģija līdz 2030.gadam. Nacionālais attīstības plans 2014.–2020. gadam uzraudzības ziņojuma pielikums (Indicators for 2015. Sustainable Development Strategy of Latvia until 2030. National Development Plan 2014-2020. Annex to the Supervision report). Retrieved:http://www.pkc.gov.lv/images/MP_zinojums/MPzinP_07092015_Indikatoru.pdf. Access: 12.09.2016.
15. Porter M.E. (1990) The Competitive Advantage of Nations. Harvard Business Review. p. 91. Retrieved: <https://www.clustermapping.us/sites/default/files/files/resource/The %20Competitive %20Advantage %20of %20Nations %20HBR.pdf>. Access: 08.06.2016.
16. Rubinson R., Browne I. (1994) Education and the Economy. In: *The Handbook of Economic Sociology*. N. Smelser., R. Swedberg Eds. NY: Princeton Univ. Press, p. 581-599.
17. Sannikova A. (2014) Economic Aspects of Lifelong Learning in Latvian Regions. In "Society, Integration, Education. Proceedings of the International Scientific Conference". Vol. II, pp. 197–206. ISSN-1691-5887.
18. Sannikova A., Dobeļe A., Zvirbule-Berzina A. (2015) Conceptual Understanding of Lifelong Education in Economics and Situation Characteristics in Latvia. In: *SGEM Conference on Political Sciences, Law, Finance, Economics & Tourism: proceedings of the international multidisciplinary scientific conferences on Social Sciences & Arts*. Albena, Bulgaria, 2015. In 2nd International Multidisciplinary Scientific Conference on Social Sciences and Arts SGEM2015, Book 2, Vol. 3: Economics & Tourism, pp. 123 – 130.
19. Warhust Cr., Thompson (2012). Mapping Knowledge in Work: Proxies or Practices? In "The Knowledge Economy and Lifelong Learning. A Critical Reader". Livingstone University of Toronto, Canada, University of London, UKD.W. P.O. Box 21858, 3001 AW Rotterdam, Netherlands, pp. 43-56.

WHAT MAKES COUNTRIES TO BE ENERGY EFFICIENT: CASE OF LITHUANIA AND UKRAINE?

Lina Sineviciene¹, PhD in Economics; Iryna Sotnyk², PhD in Economics; Oleksandr Kubatko³, PhD in Economics; Ausrine Lakstutiene⁴, PhD in Economics

^{1, 4}Kaunas University of Technology; ^{2, 3}Sumy State University

Abstract. Problems of rational use of scarce energy resources and energy efficiency improvements introduction are still relevant for contemporary national economies. The aim of this paper is to estimate an influence of different factors on energy efficiency in the case of Lithuania and Ukraine. The study covers 1995 – 2013. GLS regression framework is used. It is found that for Ukraine and Lithuania an increase in GDP per capita by one percent does increase per capita energy consumption by 0.23 percent. Thus, current paper confirms the hypothesis that the wealthier the society becomes, the more amount of energy per capita it consumes. Also it was found that countries in transition do become more energy efficient compared to their initial position, and an increase in GDP per capita by one percent does increase GDP per one kilogram of oil by 0.51 percent. Since per capita GDP in Lithuania is three times higher than in Ukraine, it means that Lithuanian achievements are much more significant than Ukrainian ones.

Oil price fluctuations are appeared to be an important source of energy efficiency improvements. The structural changes towards information society development and green economy have a positive influence on reduction of energy consumption per capita and energy efficiency growth due the decrease of industry share of the economy.

Key words: energy efficiency, resource consumption, green economy.

JEL code: O44, P48

Introduction

Problems of rational use of scarce energy resources and energy efficiency improvements introduction are still relevant for contemporary national economies. Escalating global environmental threats and increasing rates of depletion of fossil fuel and energy resources largely inhibit the economic growth of the countries. In addition, global problems of overpopulation and increasing energy consumption per capita necessitate management of factors that affect the energy efficiency growth of economic systems at different levels. Identifying these factors and levers of their effective management is the key to successful targeting influence on energy consumption of national economies in the context of sustainable development and "green" economy.

Research problems of direct and reverse impact of energy productivity and energy efficiency on economic growth, carbon intensity of national economic systems and dynamics of greenhouse gas emissions, problems of determining energy saving potential of territories and affecting factors, the study of barriers to energy efficiency increase and energy

consumption trends were investigated in many modern scientific works.

For instance, Vivid Economics (2013), Ozturk I. (2010) and Payne J. E. (2010), have studied the relationship between energy efficiency and economic growth based on analysis of a broad empirical and statistical data of countries around the world. The authors Ozturk I. (2010) and Payne J. E. (2010) concluded that economic output and energy consumption are linked, although the empirical evidence of causality, that is whether energy consumption drives economic output or vice versa, is mixed. In Vivid Economics (2013), it is noted that there is a relationship between economic growth and energy productivity but there could be causation in both directions such as:

- energy efficiency reduces production costs, which boosts factor productivity and therefore growth;
- economic growth may lead to an increase in the share of less energy-intensive sectors, such as financial services, increasing observed energy productivity in an economy.

Compared with developed countries and Third World economies, there are a few scientific publications which examine the processes of

dynamics of energy consumption and energy efficiency in transition economies. In particular, as such economies there can be considered republics of the former Soviet Union, which for the past 25 years have passed a different path. Some of them made a powerful breakthrough in energy efficiency and economic growth of their national systems and became members of the EU (Lithuania, Latvia, and Estonia). Other republics stayed far behind the leaders in the marathon for raising energy efficiency (Ukraine, Russia, Belarus and the Asian republics of the former USSR), despite the availability of the necessary resources and seemingly powerful motives for energy saving. Determining factors influencing the achievement of significant results in energy efficiency sphere by some countries and research into the causes of failures for other countries, which, in fact, had almost equal starting conditions after the Soviet Union collapse, will create the basis for improvement of energy efficiency policy in the relevant societies and provide activation of energy saving measures by business entities at micro and macro level.

The aim of this research is to estimate an influence of different factors on energy efficiency in the case of Lithuania and Ukraine.

The tasks are as follows:

- to test the hypothesis that the wealthier the society becomes, the more amount of energy per capita it consumes;
- to assess whether countries in transition become more energy efficient compared to their initial position;
- to assess the influence of oil price fluctuations and other determinants on energy efficiency improvements.

The research methods: systemic, logical and comparative analysis of scientific literature, and statistical methods - GLS regression framework.

Research results and discussion

The efficient use of energy can contribute to steadier and potentially higher economic growth by reducing the amount of energy required per

unit of output and by reducing energy demand and, hence, prices. In addition, in face of rising energy costs and increasing taxation of emissions, including emissions from energy generation, energy efficiency can provide industries and countries with a competitive advantage (Vivid Economics, 2013).

In the paper of Cantore (Cantore N., 2011), there are investigated issues about the link between total factor productivity and energy intensity levels as well as the relationship between energy intensity and profitability in developing countries by using econometric methods. In addition, there is performed a decomposition analysis to discriminate energy efficiency and structural change components of the energy intensity shifts over time at the macroeconomic level and a discrete choice analysis to investigate factors determining the adoption of energy efficiency technology in developing countries. The result of research is finding an evidence of a strong negative correlation between energy intensity and total factor productivity as well as between energy intensity and profitability. At the same time, authors do not have sufficient evidence to show that the causal relationship goes from technological change to energy efficiency or rather the other way around (or both). One more important conclusion is that the majority of developing countries shows an economic structural change towards energy intensive manufacturing sectors during the growth path.

Authors of the study Industrial energy efficiency in Developing Countries (2011) discuss the benefits of energy efficiency through the various linkages between energy efficiency and productivity at the firm level, and between energy efficiency and growth at the macro level. The study also summarizes the literature on the barriers to investment in industrial energy efficiency. The research result is that the contradictions in empirical studies indicate the variation of conditions across countries that the

relationship between productivity and economic growth is heterogeneous. Greater economic output per unit of energy input can either be achieved from changes in economic structure or through technical energy efficiency gains.

Some papers (Expert Group, 2007; Energy Efficiency Market, 2016) are devoted to the problems of identifying the size of the energy efficiency opportunity and strategies for seizing it and investigating global trends in energy efficiency. The authors of Expert Group note, that energy efficiency growth can provide not only significant environmental gains, but also expanded economic opportunities, reduced energy costs, enhanced security and alleviating poverty. In the study Energy Efficiency Market (2016), there is substantiated the influence of price fluctuations, investments and adequate state policy on implementation of energy efficient measures at all levels of management by the example of developed countries such as the US, Japan and China.

The authors Jochem et al. (Jochem E. et al., 2000) continue research in this direction and argue that energy efficiency is one of the main technological drivers of sustainable development worldwide, but achievable levels of economic efficiency depend on a country's industrialization, motorization, electrification, human capital, and policies. They concluded that:

- low incomes make it difficult for households in developing countries to switch from lower efficiency to higher efficiency (but more expensive) devices;
- catalysts, enzymes, new materials, and new processes will make possible the substitution of many energy intensive processes;
- subsidized energy prices reduce the economic attractiveness of energy efficiency measures.

With regard to these statements, incomes, energy prices and innovations are recognized as important factors influencing energy efficiency growth.

To measure the energy efficiency performance of national economies with the help of non-parametric approach, in the research of Zhou (Zhou P. et al., 2008) there is used a Data Envelopment Analysis (DEA) model that consisted of four energy inputs, two non-energy inputs, a desirable output, GDP, and an undesirable output, CO2 emissions. Following the parametric frontier approach, Filippini (Filippini M. et al., 2010) estimated an energy demand frontier function in order to attempt to isolate "underlying energy efficiency", by explicitly controlling for income and price effects, country specific effects, climate effects and a common Underling Energy Demand Trend (the UEDT, capturing "exogenous" technical progress and other exogenous factors). The results of studies show that energy intensity is not necessarily a good indicator of energy efficiency, whereas by controlling for a range of economic and other factors, the measure of energy efficiency obtained via this approach is. Thus, although for a number of countries, the change in energy intensity over time might give a reasonable indication of efficiency improvements; this is not always the case. In order to design and implement effective energy policy instruments to promote an efficient and parsimonious utilization of energy, it is necessary to have information on energy demand price and income elasticities in addition to sound indicators of energy efficiency (Filippini M. et al., 2010).

Given the reviewed literary sources, it is expedient to assert the following. The composition and extent of influence of the factors affecting the growth of energy consumption and energy efficiency in different countries, depend on characteristics of the sectoral structure of national economy, level of development and the phase of the economic cycle, the value of countries' national wealth, the ratio of consumption and accumulation rates, investment attractiveness of economic sectors, price fluctuations and others. However, scientists proved that the processes of energy consumption

and energy efficiency increase are different for groups of developed and developing countries (Industrial energy, 2011; Cantore N., 2011; Jochem E. et al., 2000; Filippini M. et al., 2010). For developed countries, the determining factors of impact on energy efficiency improvement and reducing energy consumption are the development of technology, reaching higher levels of energy independence, concern for the environment and quality of life, expanding the limits of greenhouse gas emissions trading. For developing countries, main reasons for energy efficiency improvements are problems of overpopulation, the need to respect the minimum standards of living in terms of growing energy consumption and price fluctuations. However, unlike developed countries in the Third World sufficient precondition for implementation of energy efficiency measures is successful overcome of relevant barriers. Among them there are informational barriers on available benefits, financial barriers such as an absence of credit, high risk of new technology, high transaction costs, shortage of sufficiently trained staff to implement new technologies and an absence of adequate policy and contracting institutions at the national level to encourage investment (Industrial energy, 2011). In addition, in developing countries there are some difficulties in the investigation of various factors, influencing the processes of energy efficiency growth and energy consumption dynamics, related to the lack of sufficient information and statistical data for such research, as indicated in the study Industrial energy (2011). This fact does not always give the opportunity to assess adequately the results of scientific developments.

Using the World Bank data on economic trends and countries' energy development, we will explore the impact of various factors on the dynamics of energy consumption and energy efficiency in Lithuania and Ukraine. The period of study was chosen from 1995 to 2013 taking into account the following considerations:

- after the Soviet Union collapse in 1991, during the next few years economics of the former republics were in a crisis as a result of breaking economic ties and painful state processes; since 1995, a tendency to stabilize economic processes emerged. Therefore, from our study we excluded 1991-1994 years, which do not reflect the steady trends of economic activity;
- 2014 was marked for Ukraine by the loss of state control over the part of country's territory (the Crimea and a part of Donbas) that reflected in statistical indicators of economic activity of the country and made it impossible to obtain comparable results in our study. Therefore, 2014-2016 years were excluded from the calculations, because they did not provide comparability of indicators.

The methodological base of research was formed by methods of correlation and regression analysis and the stochastic frontier function approach introduced by Aigner et al. (1977) and modified by Filippini and Hunt (2010). There were built and tested econometric models of various factors influencing on the dynamics of energy consumption per capita and the level of energy efficiency in the selected countries, as well as methods of comparative analysis were used to form conclusions and recommendations of the study. To determine the set of factors included in the model, we took into account research results published in various sources (Vivid Economics, 2013; Filippini M. et al., 2010; Cantore N., 2011; Industrial energy, 2011; Zhou P. et al., 2008). On this basis, the value of GDP per capita, the factor of price fluctuations, structural changes (taken into account through the indicator of value added of the industrial sector) and innovative activity (taken into account as technological export) were included to a set of factors influencing the energy consumption per capita. In order to build a factor model on energy efficiency, we used the same

parameters as for the previous model of energy consumption per capita.

Given the discussion above, we can construct a per capita energy consumption demand relationship for a panel of Ukraine and Lithuania, as follows:

$$E_{it} = E(Y_{it}, P_{it}, IVA_{it}, TE_{it}, ef_{it}) \quad (1)$$

Where: E_{it} - is aggregate energy consumption per capita; Y_{it} - is GDP per capita; P_{it} - is the real price of energy in terms of oil prices; IVA_{it} - is the value added of the industrial sector (in constant prices); TE_{it} - is the amount of technological export; ef_{it} - is like the unobserved level of "underlying energy efficiency" of an economy in (Filippini M. et al., 2010).

This could incorporate a number of factors that will differ across countries, including different government regulations as well as different social behaviours, norms, lifestyles and values.

In order to estimate these relations, empirically we need to transform all variables into logarithms in order to work with elasticizes. Adopting the stochastic frontier function for energy efficiency of national economy, the resulting log-log functional form of Equation (1) can be estimated as follows

$$e_{it} = \beta_0 y_{it} + \beta_1 p_{it} + \beta_2 i_{it} + \beta_3 te_{it} + \beta_4 ef_{it} + u_{it} \quad (2)$$

Where: e_{it} - is the natural logarithm of aggregate energy consumption per capita (E_{it}); y_{it} - is the natural logarithm of GDP per capita (Y_{it}); p_{it} - is the natural logarithm of the real price of energy (P_{it}); i_{it} - is the natural logarithm of the value added of the industrial sector (IVA_{it}) (in constant prices); te_{it} - is the

natural logarithm of amount of technological export (TE_{it}); ef_{it} - is the dummy variable for country specific unobserved; $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ - are regression coefficients of the model; u_{it} - is an error term.

The results of determining the importance of factors that have influence on the per capita consumption of energy in oil equivalent are presented in Table 1 below.

During the model analysis, we found the correlation between the factors of technological export and value added of the industrial sector, thus the technological export was not included into the regression model due to the possible multicollinearity. As for the unobserved level of "underlying energy efficiency", it was excluded from the model due to the small country sample.

The results presented in Table 1 are related to both countries since random effect estimations for panel data analysis were applied.

According to the results presented in Table 1, it is seen that GDP per capita in Lithuania and Ukraine is significant factor of increasing per capita energy consumption. An increase in GDP per capita by one percent does increase per capita energy consumption by 0.23 percent, which means that the richer the society, the more energy it consumes. The above-mentioned results can be explained by the fact, that richer people have more opportunities, including larger apartments, longer traveling distances promote higher rates of energy consumption. The above-mentioned dynamic effect of GDP per capita is of the same level as influence of oil price increase; in fact, increase in oil price by one percent does reduce per capita energy consumption by 0.23 percent. The effect of oil price increase is confirmed by our results and supported by scientific research papers (Vivid Economics, 2013; Filippini M. et al., 2010; Jochem E. et al., 2000).

The regression analysis of energy consumption per capita in Lithuania and Ukraine

| | | | |
|-------------------------------|------------------|---|--------|
| Random-effects GLS regression | Number of obs | = | 38 |
| Group variable: id | Number of groups | = | 2 |
| R-sq: | Obs per group: | | |
| within = 0.4216 | min = | | 19 |
| between = 1.0000 | avg = | | 19.0 |
| overall = 0.6158 | max = | | 19 |
| | Wald chi2(3) | = | 54.51 |
| corr(u_i, X) = 0 (assumed) | Prob > chi2 | = | 0.0000 |

| ln_energy_pc_oil_e | Coef. | Std. Err. | z | P> z | [95% Conf. Interval] |
|-------------------------|-----------|-----------|-------|-------|----------------------|
| ln_gdp_pc_2010_cp | .2330775 | .0578274 | 4.03 | 0.000 | .1197379 .3464171 |
| ln_oil_rprice | -.2275746 | .0519257 | -4.38 | 0.000 | -.3293472 -.1258021 |
| ln_industry_value_added | .2939923 | .0533831 | 5.51 | 0.000 | .1893634 .3986211 |
| _cons | -.1231497 | 1.546875 | -0.08 | 0.937 | -3.15497 2.90867 |

| | |
|---------|-------------------------------------|
| sigma_u | 0 |
| sigma_e | .06043405 |
| rho | 0 (fraction of variance due to u_i) |

Source: authors' calculations based on the World Bank Data and estimated at Stata 14.0.

As for the industry value added level, it is also seen from the Table 1 that the more amount of GDP is created in industrial sphere, the more per capita consumption it requires. The last statement is logical because industrial production always requires more resources than service sector. An increase in industry value added levels in Lithuania and Ukraine by one percent increases energy consumption per capita by 0.29 percent. All explanatory factors such as GDP per capita, oil prices and industry value added are appeared to be inelastic.

Having analysed the model of energy consumption per capita, we formed a regression model to estimate influence of different factors on energy efficiency in Lithuania and Ukraine:

$$EF_{it} = \beta_0 y_{it} + \beta_1 p_{it} + \beta_2 i_{it} + \beta_3 te_{it} + u_{it} \quad (3)$$

Where: EF_{it} - is the natural logarithm of energy efficiency (GDP per one kilogram of oil); y_{it} - is the natural logarithm of GDP per capita (Y_{it}); p_{it} - is the natural logarithm of the real price of energy (P_{it}); i_{it} - is the natural logarithm of the value added of the industrial sector **Error! Objects cannot be created from editing field codes.** (in constant prices); **Error! Objects cannot be created from editing field codes.** - is the natural

logarithm of amount of technological export (TE_{it}); $\beta_0, \beta_1, \beta_2, \beta_3$ - are regression coefficients of the model; u_{it} - is an error term.

Like the previous model, our calculations were related to both countries since random effect estimations for panel data analysis were applied. We have accepted the multicollinearity issues in model (3), in order to estimate the influence of innovations (teit) on energy efficiency processes.

According to the results presented in Table 2, it is seen that per capita GDP in Lithuania and Ukraine is significant factor of increasing GDP efficiency, and an increase in GDP per capita by one percent does increase GDP per one kilogram of oil by 0.51 percent. Since per capita GDP in Lithuania is three times higher than in Ukraine, it means that Lithuanian achievements are much more significant than Ukrainian ones.

The above mentioned fact is in accordance with the statement that the richer the society, the more efficient it is. An increase in GDP efficiency can be explained by the fact that richer societies have different structure of economy and can afford themselves to develop more technological industries, which are more energy efficient on average. Moreover, an increase in GDP per capita is also associated with the

development of service share as a part of GDP produced.

An increase in oil price also increases output of finished goods per one unit of energy resources (in oil equivalent), and an increase in oil price by one percent does increase GDP per one kilogram of oil by 0.35 percent. As for the industry value added level, it is also seen from the Table 2 that the larger share of GDP is created in the industrial sphere, the smaller levels of energy efficiency are observed. The last results are very logical, since the industrial sector

requires much more energy resources in comparison with the service sphere, agriculture, education etc. An increase in industry value added levels in Lithuania and Ukraine by one percent does reduce the indicator of GDP per one kilogram of oil by 0.27 percent. It was complemented by high technological export as an explanatory variable of national energy efficiency, and the results state that the larger share of technological export is created within the domestic output, the higher energy efficiency rate is observed.

Table 2

The regression analysis of energy efficiency in Lithuania and Ukraine

| | | | | |
|-------------------------------|----------|------------------|---|---------|
| Random-effects GLS regression | | Number of obs | = | 37 |
| Group variable: id | | Number of groups | = | 2 |
| R-sq: | | Obs per group: | | |
| within | = 0.9542 | min | = | 18 |
| between | = 1.0000 | avg | = | 18.5 |
| overall | = 0.9802 | max | = | 19 |
| corr(u_i, X) = 0 (assumed) | | Wald chi2(4) | = | 1586.37 |
| | | Prob > chi2 | = | 0.0000 |

| ln_gdp_per_oil_e | Coef. | Std. Err. | z | P> z | [95% Conf. Interval] |
|-------------------------|-----------|-----------|-------|-------|----------------------|
| ln_gdp_pc_2010_cp | .5161423 | .1023759 | 5.04 | 0.000 | .3154893 .7167954 |
| ln_oil_rprice | .3545969 | .0845824 | 4.19 | 0.000 | .1888184 .5203755 |
| ln_industry_value_added | -.2756612 | .1146101 | -2.41 | 0.016 | -.5002929 -.0510296 |
| ln_hitech_exports | .1204476 | .0467591 | 2.58 | 0.010 | .0288015 .2120938 |
| _cons | -.5029025 | 2.778821 | -0.18 | 0.856 | -5.949292 4.943487 |

| | | |
|---------|--|-------------------------------------|
| sigma_u | | 0 |
| sigma_e | | .07892293 |
| rho | | 0 (fraction of variance due to u_i) |

Source: authors' calculations based on the World Bank Data and estimated at Stata 14.0.

In addition, like in the previous Table 1 all explanatory factors such as GDP per capita, oil prices and industry value added are appeared to be in accordance with the theory and inelastic.

Conclusions, proposals, recommendations

- 1) The empirical research confirms the hypothesis that the wealthier the society becomes, the more amount of energy per capita it consumes. In our case, it is found that for Ukraine and Lithuania increase in GDP per capita by one percent does increase per capita energy consumption by 0.23 percent.
- 2) Moreover, it was found that countries in transition do become more energy efficient compared to their initial position, and an

increase in GDP per capita by one percent does increase GDP per one kilogram of oil by 0.51 percent. Since per capita GDP in Lithuania is three times higher than in Ukraine, it means that Lithuanian achievements are much more significant than Ukrainian ones.

- 3) Oil price fluctuations are appeared to be an important source of energy efficiency improvements. An increase in oil prices do raise output of finished goods per one unit of energy resources. It is found that an increase in oil price by one percent does provide the growth of GDP per one kilogram of oil by 0.35 percent. The results of our research confirm the necessity of proper energy price policy to

motivate population to save energy resources and stimulate business to implement energy saving measures.

- 4) The structural changes towards information society development and "green" economy have a positive influence on reduction of energy consumption per capita and energy efficiency growth due to the decrease of industry share of the economy. In addition, innovations help to implement energy efficiency improvements providing the technological base for them.

Bibliography

1. Aigner, D. J., Lovell, C. A. K., Schmidt, P. (1977). Formulation and Estimation of Stochastic Frontier Production Function Models. *Journal of Econometrics*, Issue 6(1), pp. 21-37.
2. Cantore, N. (2011). *Energy Efficiency in Developing Countries for the Manufacturing Sector*. Working Paper 15/2011. Overseas Development Institute. Retrieved: https://www.unido.org/fileadmin/user_media/Services/Research_and_Statistics/WP152011_Ebook.pdf. Access: 28.12.2016.
3. *Energy Efficiency Market Report 2016*. (2016). OECD/IEA. Retrieved: https://www.iea.org/eemr16/files/medium-term-energy-efficiency-2016_WEB.PDF. Access: 28.12.2016.
4. Expert Group on Energy Efficiency (2007). *Realizing the Potential of Energy Efficiency: Targets, Policies, and Measures for G8 Countries*. United Nations Foundation, Washington, DC, pp. 72.
5. Filippini, M., Hunt, L. C. (2010). *Energy Demand and Energy Efficiency in the OECD Countries: a Stochastic Demand Frontier Approach*. Retrieved: <http://www.seec.surrey.ac.uk/research/SEEDS/SEEDS127.pdf>. Access: 28.12.2016.
6. *Industrial Energy Efficiency in Developing Countries: A background Note* (2011). Working Paper 03/2011. Mallory Compton Overseas Development Institute. Retrieved: https://www.unido.org/fileadmin/user_media/Services/Research_and_Statistics/WP032011_Ebook.pdf. Access: 28.12.2016.
7. Jochem, E. et al. (2000). Energy End-use Efficiency, Chapter 6. In book: *World energy assessment - Energy and the challenge of sustainability*, UNDP, pp. 173-217. Retrieved: http://www.academia.edu/15562271/Energy_end-use_efficiency. Access: 28.12.2016.
8. Ozturk, I. (2010). A Literature Survey on Energy – Growth Nexus. *Energy Policy*, January, Volume 38, Issue 1, pp. 340–349.
9. Payne, J. E. (2010). Survey of the International Evidence on the Causal Relationship between Energy Consumption and Growth. *Journal of Economic Studies*, Volume 37, Issue 1, pp. 53-95.
10. Vivid Economics (2013). *Energy Efficiency and Economic Growth*. Report Prepared for The Climate Institute. Retrieved: <http://www.vivideconomics.com/publications/energy-efficiency-and-economic-growth>. Access: 28.12.2016.
11. Zhou, P., Ang, B. W., Poh, K. L. (2008). A Survey of Data Envelopment Analysis in Energy and Environmental Study. *European Journal of Operational Research*, No. 189 (1), pp. 1-18.

Acknowledgment

This research was funded by a grant (No. TAP LU-4-2016) from the Research Council of Lithuania.

This article was prepared in the framework of the joint Ukrainian-Lithuanian research project "Development of institutional and economic basis for sustainable development and "green" economy at regional level" (№ 0116U007179), funded by the State Budget of Ukraine.

PRECONDITIONS FOR ESTABLISHMENT AND HISTORICAL DEVELOPMENT STAGES OF LATVIAN RURAL TOURISM ASSOCIATION "COUNTRY HOLIDAYS"

Juris Smalinskis¹, Anita Auzina², Dr. oec., Associate Professor

¹, Latvia University of Agriculture, Faculty of Economics and Social Development, PhD student, Mg.biol, Researcher at Vidzeme University of Applied Sciences Institute of Social, Economic and Humanities Research (HESPI);

Abstract. In 1993, entrepreneurs and tourism enthusiasts came together to establish the first rural tourism association in the Baltic countries, which quickly and successfully launched rural tourism promotion in Latvian regions while implementing national and international projects of different scale, lobbying interests of the sector in state institutions and joining European scale organizations. Latvian Rural Tourism Association "Country Holidays" has become one of the largest and strongest tourist organizations in the Baltic countries; the aim of the study was to explore the historical development stages of the organization during the period 1993 - 2016, reflecting on the main factors influencing its development, and the role of the Association in the development of rural tourism. Such study has been carried out for the first time in Latvia; therefore, the main data collection method was the interview with the President of Latvian Rural Tourism Association "Country Holidays" A. Ziemele, and the investigation of the information material and documents available in the Association. One of the authors of the publication J. Smalinskis has worked in Latvian Rural Tourism Association "Country Holidays" since 2002, so his 14 years of work experience has been also used. The study results reflect the historic development of one tourism sector.

Key words: rural tourism, tourism NGO, regional development, tourism product.

JEL code: Z32

Introduction

The history of Latvian tourism development after the restoration of independence from 1990 to 2016 has been studied very little. From the published materials Kurzeme tourism history description prepared by A. Gustovska, M. Rozite, J. Smalinskis etc. can be found, which covers the period 1990 - 2011, as well as the reflection of tourism industry governance during this period in international editions (Druva-Druvaskalne, I., Livina, A 2014; Atstaja, Dz. et.al. 2015). Scientific articles related to Latvian rural tourism area usually do not reflect its historical development and are not related to evaluating the role of Latvian Rural Tourism Association "Country Holidays". Today - a quarter of a century after the restoration of Latvia's independence we are still able to use such important research and information sources as tourism industry professionals who actively participated during that time period in the beginnings of the industry and its further development processes, and who remember such details of facts and events which a few decades from now will not be available even in the archives. For the above reasons one of the authors of the article J. Smalinskis has repeatedly

and publicly turned the attention of tourism industry and academia representatives to the relevance and necessity of Latvian contemporary tourism history research.

When beginning the research, the authors of the article proposed a **hypothesis** - Latvian Rural Tourism Association (LRTA) "Country Holidays" historical development has had several separate periods. The research **aim** resulting from the hypothesis - to identify specific periods of the historic development after exploring LRTA "Country Holidays" historical materials and practical experience. The research **objectives** implemented to reach the aim:

- 1) to explore the historic preconditions of the establishment of LRTA "Country Holidays" in the period 1993 - 2016 (inclusive);
- 2) to create the development periods of the historic evolution of LRTA "Country Holidays", characterizing the different stages of development of the organization and the activities carried out.

Taking into account the specifics of the subject of the study, the limiting factor is the lack of published and scientific information for the realization of research aim and objectives. The

following research **methods** were used to obtain information and conduct the study:

- monographic or descriptive method;
- expert interview method;
- scientific induction and deduction method;
- logical structure and interpretation method.

The **materials** used during the research - LRTA "Country Holidays" archives – unpublished documents – presentations, annual summary speeches (including general meetings), press releases, prepared expenditure and projects' databases, and other materials.

Already during the feasibility study, LRTA "Country Holidays" President A. Ziemele noted the fact that so far none of the Latvian doctoral, master students or historical researchers have approached the Association with the following aim of the research, therefore, one of the most important methods for obtaining information was a face-to-face interview with A. Ziemele as the only leader of the Association since 1993. The publication is also based on the professional experience of the author J. Smalinskis (since 2002 - "Country holidays" employee - tourism and environment expert).

Research results and discussion

The early nineties of the last century (1991 - 1993) in Latvia was the time of rapid political, economic and social change. Year 1991 has been historically entitled the "Barricade" time. The same year "August Coup" took place, thus the political and economic situation in the country was very unstable. 1992 marked the beginning of Russia's withdrawal of the troops from Latvia, which continued until 1994.

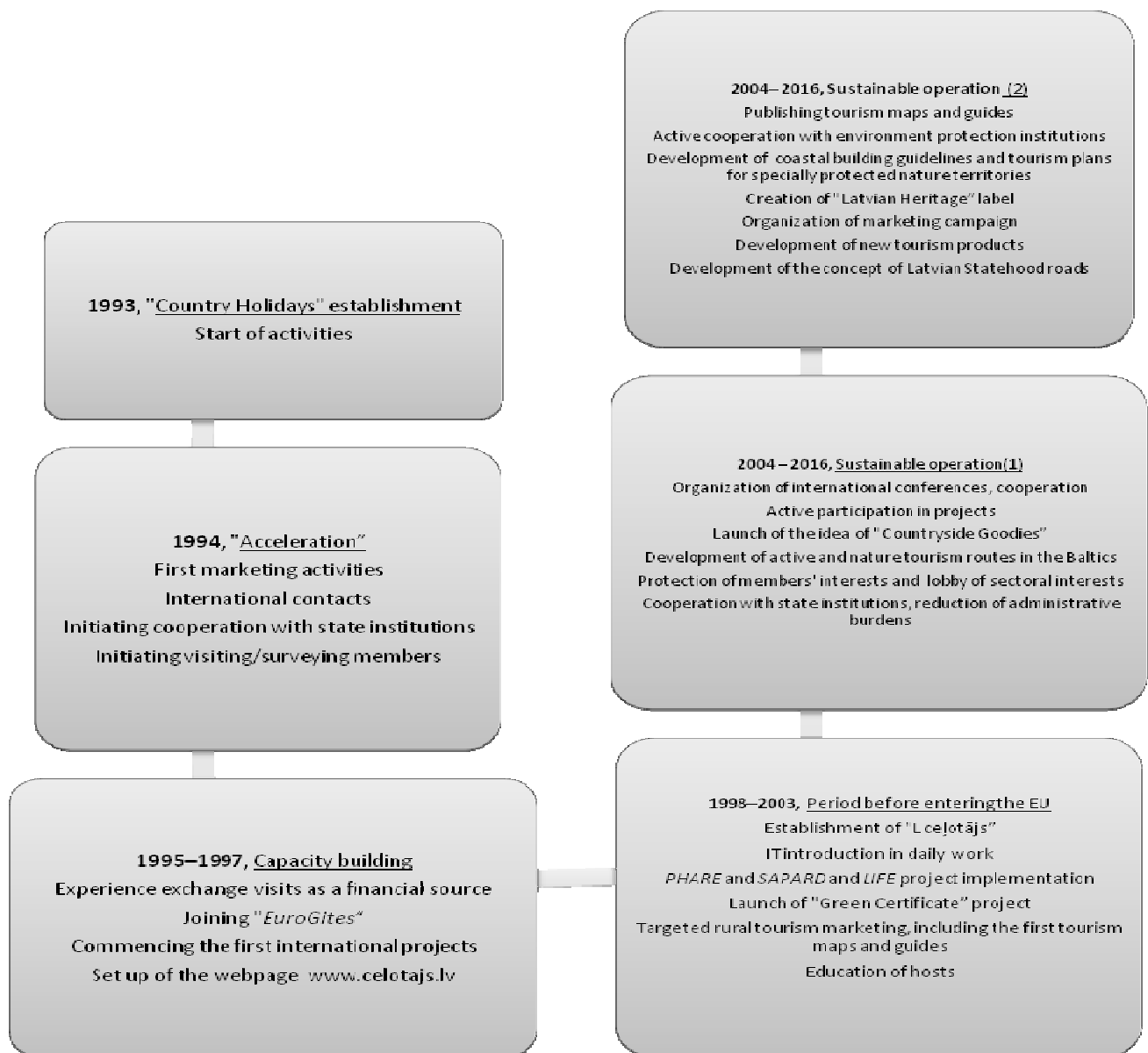
In 1992, a severe financial and banking crisis began. The drop in GDP in the period 1990 - 1993 was approximately 50 % (Paiders J., 2017). On 5 March 1993, Latvia introduced its national currency - lats (The Bank of Latvia, 2017).

Despite the economic situation in the country, urban people wanted to relax "in nature" in the summer, therefore the rural population,

particularly on the Baltic Sea coast, by rivers and lakes rented separate rooms in their private homes. Rental of rooms to summer residents was also offered previously - during the Soviet era when such activity (private business) was considered illegal. These historical facts formed the backdrop of the establishment of the first rural tourism related non-governmental organization in Latvia - a tourism association (Smalinskis J., 2017).

In Figure 1, the authors, based on LRTA "Country Holidays" unpublished materials and the expert A. Ziemele interview, using inductive and deductive method and separate historical facts of information, created a logical systematic scheme of LRTA "Country Holidays" five periods of historical development characterizing different development stages of the organization and the activities carried out.

The first period – the establishment of "Country Holidays" (1993). The above mentioned political and economic conditions and people searching for work after the gradual closing of large industrial enterprises and collective farms catalysed the development of alternative forms of business. This was also a suitable period to legalize the hosting of guests practiced already during the Soviet time, or start it as a new form of economic activity. The 18 June 1993 can be considered the official date of establishment of Latvian rural tourism as a separate tourism sector after the country became independent. Entrepreneurs and other tourism representatives gathered and the public organization "Country Holidays" was founded. On A. Ziemele's initiative, Ogre district was surveyed and the first tourist accommodation booklet was prepared. Already in the beginning, the interest in this alternative type of business in rural areas was very large - newly founded "Country Holidays" received around 300 applications from people who wanted to actively participate and welcome guests.



Source: created by the authors, based on the interviews and the documentation of LRTA "Country Holidays"

Fig. 1. LRTA "Country Holidays" historical development periods and investment in rural tourism development from 1993 to 2016

The second period – "Year of acceleration" (1994). 1994 can be considered the year of rapid development. On one stand together with other 7 Latvian districts LRTA "Country Holidays" participated in the international tourism exhibition "Balttour", which took place in Riga. This event can be considered the first targeted nationwide major rural tourism marketing activity. In parallel, the first foreign contacts were made and foreign visits organized; the information obtained there was adapted and invested in the further development of the organization and the industry. That year the catalogue "Holidays in the countryside" was

prepared for the first time, issued in Finland. During this period one of the restrictive factors of business was poor telephone services - many rural tourism hosts did not have a phone and could not be reached. In order to understand the overall situation and the quality of rural tourism services at a particular moment, there were active member visits.

The third period – capacity building of "Country Holidays" as an organization (1995 - 1997). In 1995, the first general meeting of members was held discussing further development goals of rural tourism. In Latvia, as in other post-Soviet countries, people lacked

experience in business, local governance etc. sectors, so LRTA "Country Holidays" started to organize group experience exchange visits to various European countries. The resulting profit obtained from such "business tours" was invested in strengthening of the Association and preparation of marketing materials. 1996 was a year of international recognition as LRTA "Country Holidays" was admitted in the European Federation of Rural Tourism "EuroGites". In the mid-nineties of the last century, Latvia was still little-known, therefore the positive decision on the admission of the Association in "EuroGites" did not follow immediately. At the end of 1996, 46 rural tourism farms, serving around 2.5 thousand customers during a year, were included in the catalogue "Holidays in the Countryside". In 1997, the Association implemented the first European scale project which envisaged preparing training materials for rural tourism entrepreneurs. This was one of the first significant rural tourism entrepreneurs' education activities. In 1997, the first website was created, which was nominated as the best page in "Golden Hammer". That year A. Ziemele as the tourism representative of three Baltic States spoke at the conference in Reykjavik. It should be noted that in 1997 Lithuanian Rural Tourism Association was established (Zabaliunas L., 2016) – later a cooperation partner of LRTA "Country Holidays" in European projects.

The fourth period – the period before entering the European Union (1998 - 2003).

In 1998, around 80 members had joined the Association. During this time, the material and technical basis of LRTA "Country Holidays" developed - the electronic bank payment terminal was introduced, e-mail introduced and used in communication with customers. In this period, such serious work as lobbying interests in the sectoral ministries began. One of the benefits of lobbying work was the fact that 37 rural tourism entrepreneurs received subsidies for rural tourism product development of a total amount

of 80 500 EUR. In 1999 LRTA "Country Holidays" declared itself as a serious candidate in the project field, getting approved its first project in PHARE programme, which resulted in an online reservation system facilitating communication with clients and hosts. This year the project was launched on the "Green Certificate" in rural tourism establishments that operated in an environmentally friendly way. In 2000, thanks to LRTA "Country Holidays" lobby, SAPARD programme became available to rural tourism entrepreneurs in addition to PHARE programme - another so-called pre-structural fund, which initiated significant changes in quality improvement of infrastructure of rural tourism accommodation. In 2000, Estonia founded the Rural Tourism Association "Eesti Maaturism" (Mengel R., 2016.), which later became a cooperation partner of "Country Holidays" in common rural tourism cross-border development projects. In 2001, the Association launched the LIFE programme project for the first time, which anticipated that the environmental quality label "Green Certificate" was taken up at the national and European level. In 2001, the Association had 150 members. In 2001, the number of customers served – number of people staying overnight in rural tourism establishments - had grown by 20 %, compared to the year 2000. Annual number of visits at LRTA "Country Holidays" website had already reached 80 000, and there was a section "Professional information" developed, which was mainly aimed at entrepreneurs and other industry stakeholders as a significant source of information. In 2002, the number of members reached 210. That year an educational film about the "Green Certificate" was made, which was meant to be a methodical material for rural tourism entrepreneurs. Year 2003 marked the 10th anniversary of LRTA "Country Holidays", and during this period since its foundation the Association had managed and participated as a partner in 87 projects with a total amount of 707 440 EUR. In 2003, the idea

of "rural farms of countryside goodies" came up - farms open to visitors, which later gained widespread popularity in Latvia in the tourism sector. As a result, the first "Countryside Goodies" guide was published.

The fifth period - LRTA „Country Holidays” sustainable operation period (2004 - 2016). In 2004, Latvia joined the European Union. This year LRTA "Country Holidays" finished three large-scale projects and organized an international conference, opened by the World Tourism Organization representative. The conference was attended by representatives from 30 different countries (in total - 120). In 2004, there was a 30 % increase in the number of customers in rural tourism. In 2005, the employees of LRTA "Country Holidays" worked on active tourism routes for hikers, water tourists, cyclists, cross-country skiers and motorists throughout Latvian territory while visiting and testing them themselves. One of the reasons for this activity was the goal to change the customer and the rural tourism entrepreneur understanding that rural tourism "is not just a bed and a roof over your head." In cooperation with the Association, a new nomination "Eco-tourism farm" was created in the long-lasting competition "Sower" of the Ministry of Environment and Agriculture; it successfully operated until the economic crisis in 2009. In 2006, LRTA "Country Holidays" came up with an appeal "do not kill Grandma pancakes" meant as a protest against the administrative burden created by the state institutions affecting small rural entrepreneurs. On February 3 of the same year, a resolution was adopted in which the Association put forward requests of the Prime Minister of Latvia A. Kalvitis and several ministries relating to incentives in taxes, construction, food circulation, competition etc. areas. In collaboration with the Food and Veterinary Services, LRTA "Country Holidays" developed simplified guidelines in the area of food circulation, which was an important foothold

for small-scale catering enterprises. In 2007, on the basis of the Association webpage rural tourism hosts could already build their own business pages and easily and quickly replace the topical information. In 2008, LRTA "Country Holidays" started Latvian river surveys, which resulted in the water tourism guide; the principles and ideas incorporated in it later were taken over by other project promoters in this area in the Baltic States. In 2009, a new project was launched in LIFE programme, during which the Association was able to gather nature protection, tourism and local government representatives at one table. One of the major results of the project was "Slitere Travellers' Days" which is still organized - even after the end of the project. This idea was later taken over also by Kemer National Park in organizing the annual "Kemer National Park Travellers' Days". In the framework of the above mentioned project, Latvian and Baltic National Park travel guides were developed, as well as many other tourism publications. Many of them - for the first time in Latvia. In 2010, one of the most visible successes of the Association were the amendments adopted regarding Handling of Alcoholic Beverages Law under which rural tourism entrepreneurs were allowed to manufacture and sell home-produced wines and alcoholic beverages to their customers. As a result of that, Latvia experienced a "boom" in wine producers. In 2011, LRTA "Country Holidays" organized an international nature tourism conference which was attended by 258 environmental protection and tourism industry related representatives from 18 countries. At the same time 4 tourism plans of specially protected natural areas were prepared, as well as the bestseller, as called by the industry of that time, - "Military heritage tourism map". In 2012, A. Ziemele was elected in "EuroGites" board. In cooperation with the Latvian Fund for Nature, "Forest Guide" was published in order for rural tourism service providers to explore the components of biological diversity in their farms

and their surroundings. In 2013, in collaboration with the Ministry of Culture a cultural label "Latvian Heritage" was initiated; it is still granted to entrepreneurs that keep the Latvian traditions and exhibit them for visitors. It is expected that by the 100th anniversary of Latvia, the number of entrepreneurs who have received the label will reach one hundred. In 2014, a large-scale project "Marketing campaign to promote rural tourism and develop rural tourism products in all Latvia regions" was initiated; its aim was to involve even more new players (including farms, craftsmen and other rural entrepreneurs) and exhibit their activities and products to tourists, while promoting the development of entrepreneurship in rural areas. As a result, a number of events were organized - "Open days in the countryside". In 2015, there was a number of significant activities - LRTA "Country Holidays" developed a new product for local and foreign seniors - the so-called Silver Suitcase, organized a conference on green farming, but the president of the Republic of Latvia Raimonds Vejonis became the patron of the "Green Certificate". The next year - 2016 - was marked by a negative trend (for the first time after the economic crisis) - the income in rural tourism industry had decreased by 10 - 15 % due to state tax policy, rise in prices for services, including electricity etc. The board of LRTA "Country Holidays" sent a resolution to the responsible ministries entitled "Legislators turn the lights off in the Latvian countryside". At the same time, active work was done on Latvian Statehood road project, "Latvian heritage" label etc. The guide "Tasty cheese road" was released.

Conclusions, proposals, recommendations

1) As a result of political and socio-economic changes, in the early nineties of the last century there were the first seeds of rural tourism as entrepreneurship in Latvia and conditions for establishing the public organization - LRTA "Country Holidays".

- 2) In a short period of time, LRTA "Country Holidays" as a non-governmental organization strengthened their capacity and leadership role in rural tourism development area in Latvia, and along with the establishment of related organizations in Lithuania and Estonia - on the Baltic level.
- 3) Experience exchange visits and the adaptation of the acquired knowledge in Latvian conditions played an important role in further development of the Association and the rural tourism industry, as well as the international contacts and activities, and the first projects implemented on European scale that resulted in development of the facilities of the Association and the education of rural tourism entrepreneurs.
- 4) Active rural tourism marketing and information technology in their daily work in communication with clients and farm owners established the popularity of LRTA "Country Holidays", which contributed to the attraction of new members in the organization and the increase of the administrative and financial capacity of the Association.
- 5) Owing to the EU pre-accession funds and their acquisition, the quality of rural tourism infrastructure and product improved significantly in Latvia regions.
- 6) Many of the initiatives started by LRTA "Country Holidays" - "Green Certificate", "Countryside Goodies", "Latvian Heritage", "Slitere Travellers' Days" etc. are still active and can be nominated as national scale activities, pointing to the sustainability of these projects both in space and time.
- 7) LRTA "Country Holidays" lobbying activities and collaboration with various state institutions - in reduction of administrative barriers and proposing other legislative initiatives should be mentioned as significant; as a result, incentives have been created for small-scale business, which has facilitated entrepreneurship in Latvian rural areas.

- 8) The tourism products developed by LRTA "Country Holidays" - active, nature, cultural and culinary heritage routes and products for seniors have gained wide application in Latvian regions, promoting the influx of tourists.
- 9) LRTA "Country Holidays" has prepared and published more than 50 different travel guides, tourist maps and brochures in Latvian, German, English and Russian, which has made a significant contribution to promoting Latvia as a tourist destination on European and Baltic level.
- 10) The work of the Association can be assessed as sustainable, because it is still active, integrating both rural socio-economic development and new policy initiatives in its activities, as well as care for preservation of the natural and cultural resources; this makes

it one of the leading rural tourism organizations of Baltic and European countries.

Unpublished materials

Professional experience of Juris Smalinskis as a tourism and environment expert of LLTA "Lauku celotajs"

Document archive of LLTA "Lauku celotajs"

Bibliography

Books

1. Atstaja, Dz., Brivers, I., Livina, A. 2015. National Approaches to Planning and Tourism in Latvia. In Planning For Tourism: Towards a Sustainable Future. (ed. Nigel & Gordon) CABI.
2. Druva-Druvaskalne, I., Livina, A. 2014. Tourism in Latvia: from Fragmented Resorts of Russian Empire to a National Brand on International Level. In "European Tourism Planning and Organisation Systems" Volume II. (ed Costa, C., Panyik, E., Buhalis, D.) pp.118-130
3. Gustovskis, A., Rozite M., Smalinskis, J. u.c. (2011). Turisms Kurzeme. Labas prakses piemeri. Rokasgramata turisma pakalpojumu attistībai. pp 14 – 18.

Internet sources

4. Latvijas Banka. <https://www.bank.lv>. Access: 2016. gada 28. decembris.
5. LLTA "Lauku celotajs" mājas lapa, www.celotajs.lv. Access: 15. – 26.12.2016.
6. Paiders, J. Latvijas ekonomikas agonija gaidama, tuvojoties 2020. gadam. <http://nra.lv/latvija/196388-latvijas-ekonomikas-agonija-gaidama-tuvojoties-2020-gadam.htm>. Access: 2016. gada 28. decembrī.

Interviews

7. Mengel, R., Igaunijas lauku turisma asociacija (Estonian Rural Tourism Association), interview on 27 December 2016
8. Zabaliunas, L., Lietuvas lauku turisma asociacija (Lithuanian Rural Tourism Association), interview on 27 December 2016
9. Ziemele, A., interview on 26 December 2016

REGIONAL DISPARITIES IN LEVEL AND DYNAMICS OF GROSS DOMESTIC PRODUCT AT NUTS-3 REGIONS IN CENTRAL EUROPE AND THE BALTIC STATES

Maciej Stawicki¹, PhD

¹Warsaw University of Life Sciences (WULS-SGGW)

Abstract. The article deals with regional disparities in the level and dynamics of Gross Domestic Product (GDP) in Central Europe and the Baltic States. The analysis was made for NUTS-3 regions divided into rural, intermediate and urban types according to the Eurostat classification. The aim of the study was to identify the regional disparities in economic development level, its dynamics, dispersion and changes in the period 2004-2013 using Eurostat data on GDP per inhabitant in percentage of the EU-28 average. Also the dispersion and its changes over time in different types of regions were analysed. The fastest growth of GDP was identified in the Baltic States, also in their rural areas. In 5 of 6 analysed countries, the level of GDP in relation to the EU average was rising, the only country with no progress in GDP in the period 2004-2013 was Hungary, where nearly half of the regions retreated in economic development in relation to the EU-28 average. The dynamics of GDP was higher in the group of urban regions, lowest in the group of rural and intermediate areas. Calculations showed a weak negative statistical dependence between level and dynamics of GDP in the rural and intermediate regions. Generally, the dispersion of GDP was highest in Poland in all type of regions, in Slovakia and Hungary in the rural areas and in the Czech Republic in the urban regions.

Key words: GDP disparities, dynamics, NUTS-3, Central Europe, Baltic States.

JEL code: R11, P25

Introduction

Regional disparities in GDP dynamics were often subject of scientific studies (among others: Krueger A., 2011; Wojnicka E., 2008). Studies at NUTS-3 level were rather rare and analyses taking into account the typology of regions (with special interest in the rural areas) in Central Europe and the Baltic States were not performed before.

The main aim of the paper is to identify the regional disparities in economic development level and its dynamics in different types of regions. The level of GDP was compared to its dynamics in order to identify convergence process in one of its meanings (Barro, R., J., Sala-i-Martin, X., 2004). The author does not aspire to assess the reasons of these processes or disparities, which can be the aim of a next detailed study. Statistical analyses of convergence were not subject of this study as they were subject of many studies before (Bal-Domanska, B., 2011; Pietak, L., 2015; Wojewodzka-Wiewiorska, A., Dudek, H., 2016; Wojcik, P., 2008). In addition, the dispersion and its changes over time were analysed in order to verify the thesis of cohesion among the regions.

The main indicator used in the study was the Gross Domestic Product (GDP) at current market prices by NUTS 3 regions with the unit purchasing power standards (PPS) per inhabitant in percentage of the EU average, published by Eurostat (Eurostat, 2016). The study period was set to the years 2004-2013, with the beginning in the year of EU accession and end in 2013 as the data for 2014 were at the time of retrieving not available for all NUTS 3 regions.

Descriptive methods were used, the data was presented using tables, graphs elaborated with Excel and Statistica software.

The analysis was performed on all 135 NUTS-3 regions in selected 7 countries from Central Europe: the Czech Republic (since 2016 also another official shorter name Czechia is possible to be used (International Organization for Standardization, 2017)), Hungary, Poland and Slovakia and the Baltic States: Estonia, Latvia and Lithuania. The regions were divided into three groups according to the classification by Eurostat. The typology classifies the NUTS-3 regions into three groups: predominantly urban, intermediate and predominantly rural regions depending on the share of the rural population (Eurostat, 2013). This classification was used

having in mind that at the EU level, there is no uniform definition for rural areas (Abrham, J., 2011), and that various classifications are used worldwide (Rakowska, J., 2014). The Eurostat data concerning GDP were combined with the regions' typology, which had to be updated by the author as a result of changes in NUTS-3 division made in the year 2015. For each region the average change of GDP in the period 2004-2013 and other descriptive statistics were calculated.

Research results and discussion

1. GDP level and dynamics

The extreme values of GDP in the analysed regions are presented in Tab.1. The lowest GDP per capita in relation to the EU average in urban and intermediate regions was identified in Poland both in 2004 and 2013. In the rural areas in 2004 the *poorest* region was located in eastern Latvia and in 2013 in the northern Hungary. The

best developed (GDP is often used as an indicator of economic development) rural areas were in 2004 located in the Hungarian-Austrian-Slovak borderland. In the year 2013 two regions in this category were identified: Trnavsky kraj (neighbouring Bratislava) and Plocki, where Polish enterprise with the highest revenues is located - PKN Orlen oil company, ranked 454 in the Fortune Global 500 list (Global 500, 2016).

Among urban regions the best development level was identified in the capitals: in 2004 in Prague, in 2013 in Bratislava Region, also the metropolitan Estonian region (classified by Eurostat as intermediate) was the GDP leader in both compared years. Fast economic growth of Bratislava can be an effect of high concentration of financial services, significant foreign investments and developed industry (Volkswagen automotive cluster, Slovnaft) (Skregions, 2017).

Table 1

NUTS-3 regions of different types with highest and lowest GDP in 2004 and 2013 region – country (GDP as a % of EU-28 average)

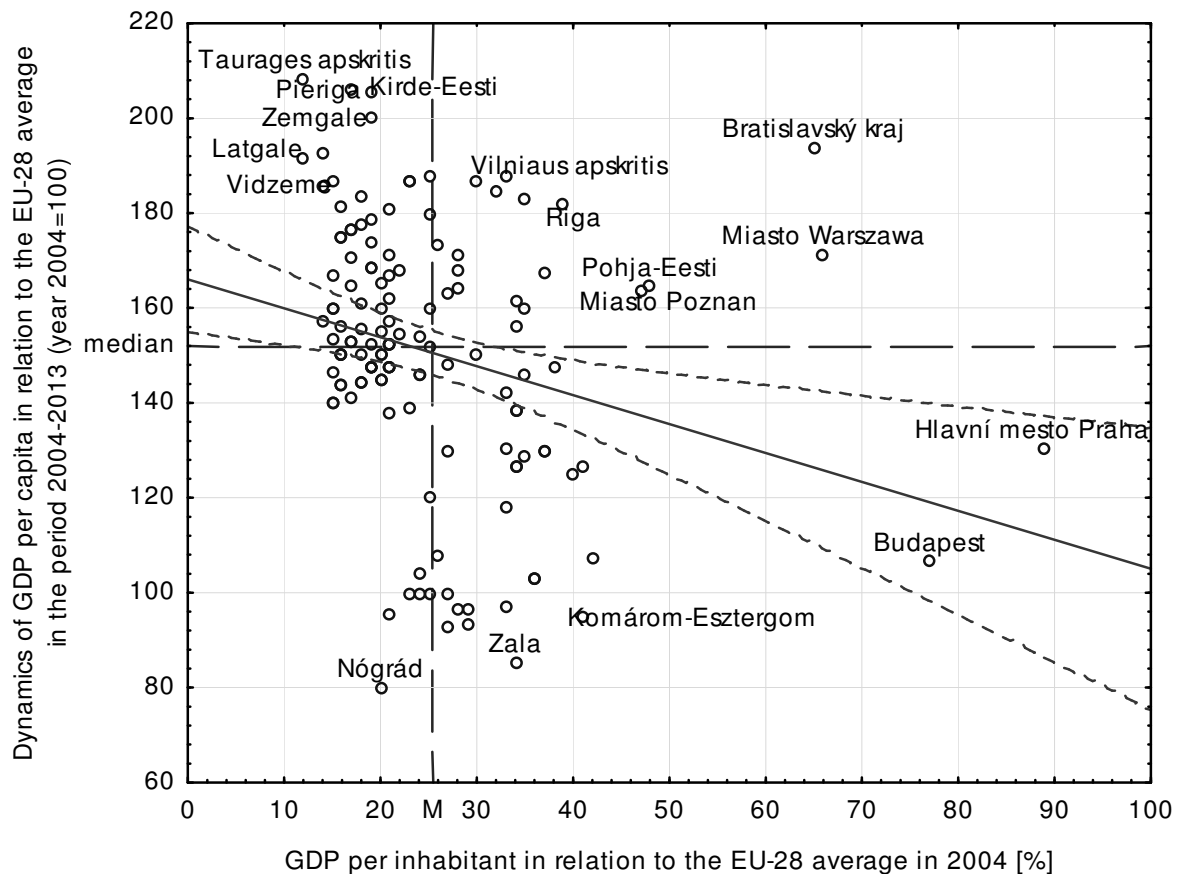
| Types of regions: | 2004 | | 2013 | |
|-------------------|-------------------------------|-----------------------------|--------------------|--------------------------------------|
| | Lowest GDP | Highest GDP | Lowest GDP | Highest GDP |
| urban | Bytomski, Krakowski - PL (16) | Praha - CZ (89) | Bytomski - PL (28) | Bratislava - SK (126) |
| intermediate | Nyski - PL (15) | Pohja-Eesti - EE (48) | Elcki - PL (22) | Pohja-Eesti - EE (79) |
| rural | Latgale - LV (12) | Gyor-Moson-Sopron - HU (42) | Nograd - HU (16) | Trnavsky kraj - SK, Plocki - PL (56) |

Source: author's elaborations based on Eurostat data

Fig 1. shows the relation between the value and dynamics of GDP per capita among all analysed regions. Although the capital regions of Czechia and Hungary have had a higher GDP at the beginning of the study period, their dynamics was relatively lower than in the capitals of the Baltic States. The exceptions are Bratislava and Warsaw, where both the level and the dynamics were high.

The regression belt shows a weak negative statistical dependence between level and dynamics of GDP. In the analysis performed for

three separate groups the calculated correlation coefficients (R) were statistically significant for rural (R=-0.55) and intermediate regions (R=-0.35). Also the graphs showed a negative correlation in the rural areas and a weak negative relationship in the group of intermediate regions, which means that some less developed rural regions were developing faster in the period 2004-2013, although it does not necessarily have to mean convergence processes (Geodecki, T., 2006). In the group of urban regions the correlations were insignificant.



Source: author's elaboration based on Eurostat data

Fig. 1. The level and dynamics of Gross Domestic Product per capita in relation to the UE-28 average in NUTS-3 regions

Generally, the dynamics of GDP was higher in the group of urban regions (Tab. 2), which confirms results of other studies (Smetkowski, M., 2015; Szlachta, J., Dziemianowicz, W., Szmigiel-Rawska, K., 2011). The dynamics of GDP was lowest in the group of rural areas, the growth in the intermediate regions did not take on the lowest values, but surprisingly the difference between those two groups was very little.

The analysis for countries shows interesting differences. Rural regions were developing fastest in the Baltic States and Slovakia. In Latvia the difference in dynamics between rural and urban areas was very little, while in the Czech Republic the change of GDP was even higher in the rural areas than in the metropolises. The only country with decreasing values of GDP in relation to the EU average was Hungary (in the country in total, especially in the intermediate regions).

Table 2

Dynamics of GDP per capita in relation to the EU average in the period 2004-2013 in different types of regions (year 2004=100)

| Country | Urban regions | Intermediate regions | Rural regions | Country total |
|---------|---------------|----------------------|---------------|---------------|
| LV | 194 | 152 | 190 | 185 |
| LT | 183 | 187 | 174 | 178 |
| SK | 194 | 170 | 174 | 175 |
| EE | -* | 185 | 164 | 172 |
| PL | 163 | 156 | 156 | 158 |
| CZ | 128 | 131 | 133 | 131 |
| HU | 106 | 96 | 100 | 99 |
| Total | 162 | 149 | 148 | 150 |

*No regions classified as urban in Estonia
Source: author's calculations based on Eurostat data

2. GDP dispersion and changes

The disparities of Gross Domestic Product in NUTS-3 urban, intermediate and rural regions were shown in Fig. 3. In the rural areas, the

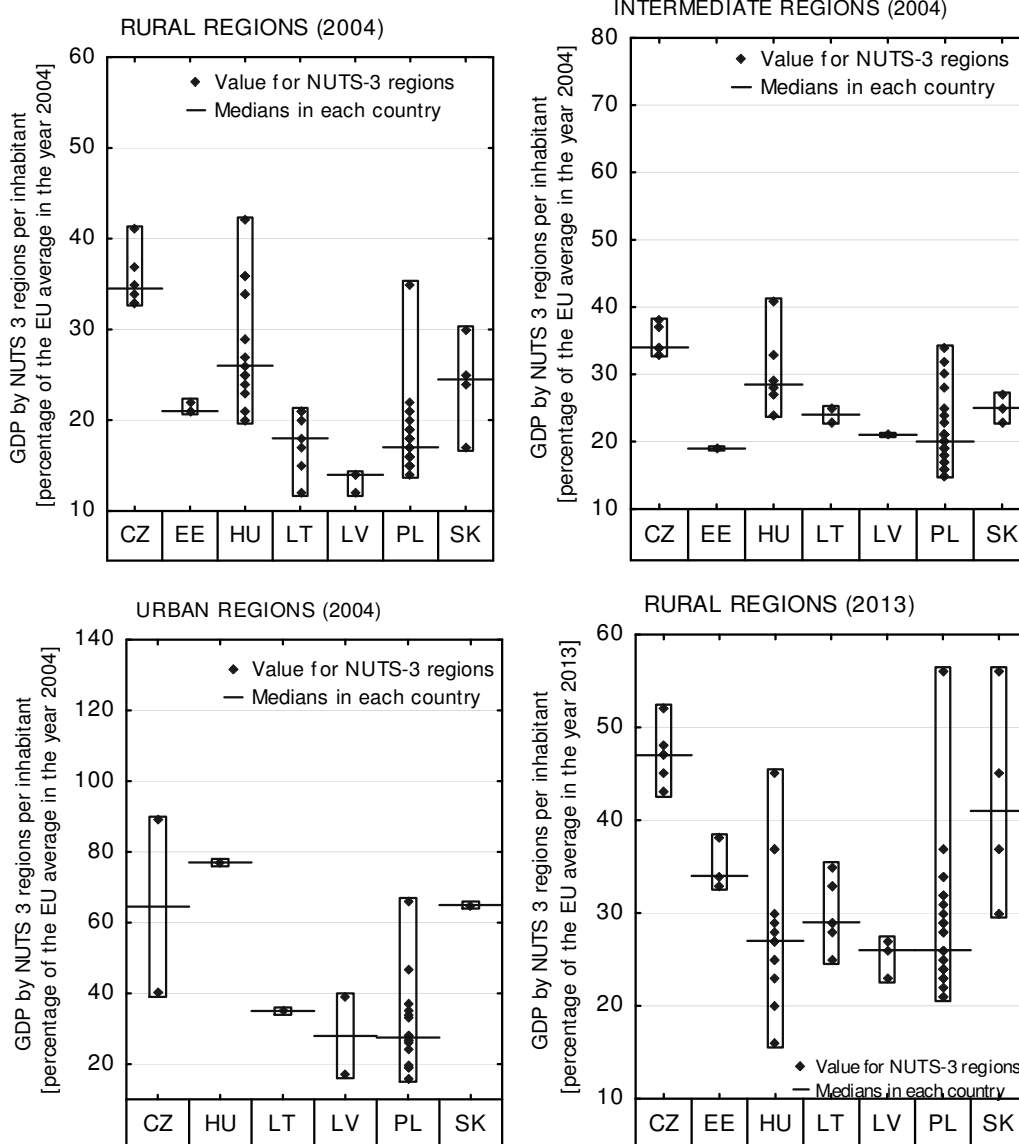
highest differences between NUTS-3 regions in both analysed years were identified in Poland, Hungary and Slovakia. Generally, the dispersion of GDP was highest in Poland in each type of regions. Comparing graphs for both years can lead to conclusion that the absolute differences in this feature were rising in most countries, although in Hungary and Slovakia this spread increased in the slightest extent.

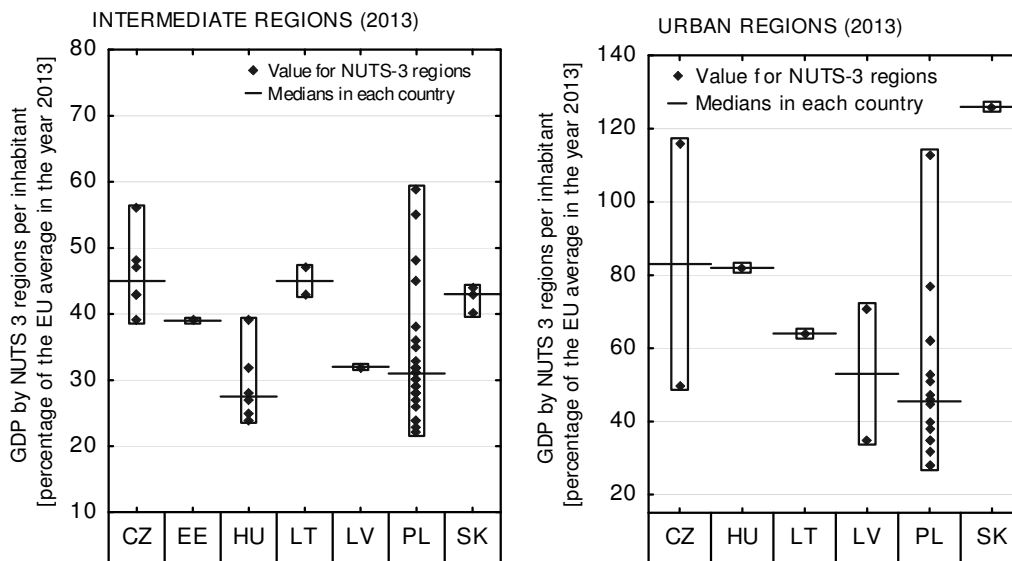
Standard deviation was used to measure the variability of GDP in the period 2004-2013 (Fig. 2.).

Absolute differences in the level of GDP were higher and increasing fastest in the urban regions. This was caused by a very high growth of the metropolitan areas, mainly the capital cities (compare with Fig. 1.). Differences in rural and intermediate regions were also rising, but much slower than in the urban regions.

Error! Objects cannot be created from editing field codes.
Source: author's elaboration based on Eurostat data

Fig. 2. The differences of Gross Domestic Product in NUTS-3 urban, intermediate and rural regions in the period 2004-2013





Source: author's elaboration based on Eurostat data

Fig. 3. The disparities of Gross Domestic Product in NUTS-3 urban, intermediate and rural regions

In the figure one can also observe that in 5 of 6 analysed countries the level of GDP in relation to the EU average was rising, only Hungarian rural and intermediate areas characterised stagnation – 4 regions did not improve their position in relation to the average EU GDP, and 9 regions even retreated in this indicator values in the period after accession to the EU.

The dispersion of GDP was presented using variation coefficient calculated with the following formula:

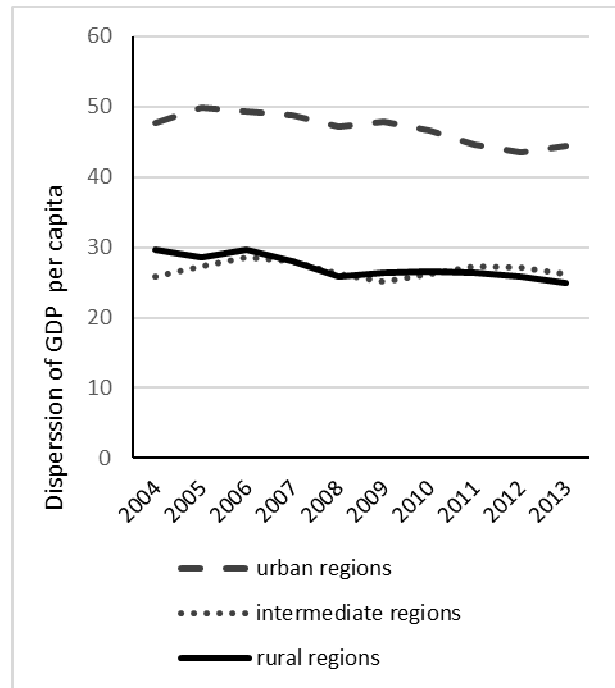
$$V = \frac{SD}{M} \quad (1)$$

Where:

V - is the variation coefficient,

SD - standard deviation; M - mean value.

Fig. 4. shows that the differentiation of NUTS-3 regions was medium in the rural and intermediate areas, and large in the urban regions. The dispersion was slightly decreasing in the period 2004-2013 in all types of regions,



Source: author's elaboration based on Eurostat data

Fig. 4. Changes of GDP dispersion in the period 2004-2013

Conclusions, proposals, recommendations

The main aim of the paper was to identify the regional disparities in the level and dynamics of Gross Domestic Product as the main indicator of economic development. The author analysed different types of regions according to the Eurostat classification of predominantly urban, intermediate and rural areas. According to the

Eurostat data the study can lead to the following conclusions:

- 1) The fastest growth of GDP was identified in the Baltic States, also in their rural areas. In 5 of 6 analysed countries the level of GDP in relation to the EU average was rising, the only country with no progress in GDP in the period 2004-2013 was Hungary, where nearly half of the regions retreated in economic development in relation to the EU-28 average.
- 2) The dynamics of GDP was higher in the group of urban regions, and lower in the group of rural and intermediate areas, but the differences between these two groups were insignificant.
- 3) Calculations showed a weak negative statistical dependence between level and dynamics of GDP in the rural and intermediate regions.
- 4) The dispersion of GDP was highest in Poland in all type of regions, in Slovakia, in Hungary in the rural areas and in the Czech Republic in the urban regions.

- 5) The absolute differences in the level of GDP were increasing while dispersion was decreasing in the analysed period in all types of regions.

On the basis of this study one can conclude that economic growth in Central Europe and the Baltic States was highly differentiated. The growth leaders were the Baltic States and Slovakia, all those countries characterised a fast development not only in the capitals but also in the rural areas. Poland was the country with highest regional differences between regions, even within one type of them. Hungary was the only country where rural and intermediate areas characterised stagnation or decrease of GDP values in relation to the average EU-28.

This paper was not devoted to identifying the factors of development or reasons for the different growth of NUTS-3 regions. Next analyses could be aiming at explaining the here identified differences on regional and international level, with a particular focus on the most dynamic rural areas.

Bibliography

Journal paper with author(s)

1. Abrham, J. (2011). Rural Development and Regional Disparities of the New EU Member States. *Agricultural Economics (AGRICECON)* 57(6). pp. 288-296.
2. Bal-Domanska, B. (2011). Ekonometryczna identyfikacja konwergencji regionow szczebla NUTS-2 panstw Unii Europejskiej (Econometric Identification of Convergence in NUTS-2 Level Regions of European Union Member Countries). *Acta Universitatis Lodzianis Folia Oeconomica* 253, pp. 9-23.
3. Geodecki, T. (2006). Procesy konwergencji i polaryzacji w regionach Unii Europejskiej. (The Processes of Convergence and Polarization in the Regions of the European Union). *Zeszyty Naukowe Akademii Ekonomicznej w Krakowie* nr 714. p. 81.
4. Pietak, L. (2015). Convergence across Polish Regions, 2005–2011. *Comparative Economic Research*, Volume 18, Number 2, pp. 99-117.
5. Smetkowski, M., (2015). Konwergencja gospodarcza i formy dyfuzji rozwoju w krajach Europy srodkowo-wschodniej. (Economic Convergence and Forms of Diffusion Of Development in The Countries Of Central and Eastern Europe). *Roczniki Ekonomiczne Kujawsko-Pomorskiej Szkoły Wyzszej w Bydgoszczy* nr 8, pp. 324-338.
6. Wojewodzka-Wiewiorska, A., Dudek, H, (2016). Dynamics of Rural Areas Development in Poland - Convergence Analysis. *Research for Rural Development 2016*, volume 2, Jelgava, pp. 99-104.
7. Wojcik, P. (2008). Dywergencja czy konwergencja: dynamika rozwoju polskich regionow. (Divergence and Convergence: the Dynamics of the Development of Polish Regions). *Studia Regionalne i Lokalne* Nr 2(32), pp.41-60.

Books

8. Barro, R., J., Sala-i-Martin, X. (2004) *Economic Growth*. Cambridge, London: MIT Press. p. 50.
9. Rakowska, J., (2013). *Klasyfikacje obszarow – kryteria, definicje, metody delimitacji. Studium metodyczno-statystyczne. (Classifications of Areas - The Criteria, Definitions, Methods of Delimitation. Methodical and Statistical Study)*. Warszawa: Wydawnictwo Wies Jutra, p. 156.
10. Szlachta, J., Dziemianowicz, W., Szmigiel-Rawska, K. (eds.) (2011). *Subregionalne bieguny wzrostu w Polsce. (Subregional Growth Poles in Poland)*. Warszawa: Uniwersytet Warszawski. Wydział Geografii i Studiów regionalnych, p. 57.

Internet sources

11. *Bratislava*. Retrieved: <http://www.skregions.eu/92/bratislava.php>. Access: 06.01.2017.
12. *Fortune Global 500 list*. Retrieved: <http://beta.fortune.com/global500/pkn-orlen-group-454>. Access: 06.01.2017.
13. *Gross Domestic Product (GDP) at Current Market Prices by NUTS 3 Regions*. Retrieved: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10r_3gdp&lang=en. Access: 27.12.2016.
14. International Organization for Standardization, Retrieved: <https://www.iso.org/obp/ui/#iso:code:3166:CZ>, Access: 15.01.2017.
15. *Krueger, A. (2011). Convergence and Disparities in Regional Gross Domestic Product. Statistics in focus — 46, pp. 1-7*. Retrieved: <http://ec.europa.eu/eurostat/documents/3433488/5579472/KS-SF-11-046-EN.PDF>. Access: 12.01.2017.
16. *Regional Disparities in GDP per Capita in the EU after the Financial Crisis*. (2014). Noteworthy Statistics – 28 May 2013. 57 p. Retrieved: londoneconomics.co.uk/wp-content/uploads/2013/05/Regional-disparities-in-GDP-per-capita-in-the-EU-28-05-20131.pdf. Access: 27.12.2016.
17. *Updated urban-rural typology: integration of NUTS 2010 and the latest population grid*, Statistics in focus 16/2013;. Retrieved: http://ec.europa.eu/eurostat/statistics-explained/index.php/Urban-rural_typology_update. Access: 06.01.2017.
18. *Wojnicka, E., (2007). Regional Disparities – Necessity during Catching Up, Obstacle If They Last Too Long*. Retrieved: [http://kandydaci.wsiz.rzeszow.pl/userfiles/file/\(117\) A1 - Regional disparities - necessity during catching up, obstacle if they last too long.pdf](http://kandydaci.wsiz.rzeszow.pl/userfiles/file/(117)A1-Regional%20disparities%20-%20necessity%20during%20catching%20up,%20obstacle%20if%20they%20last%20too%20long.pdf). Access: 29.12.2016.

ENHANCEMENT OF EMPLOYMENT OPPORTUNITIES FOR THE DISABLED UNEMPLOYED IN ZEMGALE REGION

Anastasija Vilcina¹, Dr.oec.; Zane Blumberga², Mg.oec.

¹Latvia University of Agriculture; ²State Employment Agency

Abstract. The paper analyses the distinctive characteristics of the disabled unemployed, the socio-economic consequences of disabled unemployment and the measures taken to integrate the disabled into the labour market, based on a review of the economic literature, strategic policy documents, employment policies of the EU and Latvia and the related legislation. Using the data provided by the State Employment Agency (SEA), the paper identified trends in the number of the disabled unemployed, their age composition, education level and unemployment duration in Zemgale region and Latvia in the period 2008-2016 and analysed the results of participation of the mentioned target group in national government- and ESF-funded employment activities in the period 2008-2014. Based on a critical analysis of a survey of 152 disabled unemployed individuals in Zemgale region, which accounted for 17 % of their total number, and of an interview of 19 employers, the present research developed proposals for the Ministry of Finance, local governments and nongovernmental organisations, the SEA, which are aimed at enhancing the employment opportunities for the disabled unemployed and integrating them into the social life.

Key words: disabled unemployed, employment, enhancement, Zemgale region.

JEL code: J14, E24

Introduction

Employment and unemployment issues are important in any society, as they involve dealing with the labour force, which is often one of the most important factors of production, and employment relationships. However, as mentioned by British economists J.E.Stieglitz and J. Driffill, one of the most amazing distinctive characteristics of unemployment is the fact that different groups of individuals create unequal economic and social problems (Stiglitz Dz.E., Drifils Dz., 1994). It is particularly attributable to the disabled unemployed, which accounted for 10.5 % of the total number of unemployed individuals in the country at the end of 2015 (Parskats par bezdarba...2015). Functionality impairments of various degrees were among the key reasons of unemployment for the disabled unemployed, while in the context of unemployment consequences, social exclusion and self-esteem problems were very important as well. This, in its turn, requires an in-depth examination of employment opportunities for the disabled unemployed, which have been addressed in the Sustainable Development Strategy – Latvia 2030, which envisages engaging the entire available human capital in raising labour productivity (Latvijas ilgtspējīgas

attīstības..., 2010). In a medium-term, the National Development Plan of Latvia 2014-2020 requires developing an inclusive, sustainable and competitive economy, in which human resilience is one of the three priorities for an "economic breakthrough" (Latvijas Nacionālais attīstības..., 2012). Both the EU and Latvia – in its Inclusive Employment Guidelines 2014-2020 – addressed the necessity for an inclusive and balanced labour market and gave priority to tackling employment problems (Iekļaujosas nodarbinātības..., 2015).

The research aim is to characterise the disabled unemployed in Zemgale region and identify enhancement opportunities for the disabled unemployed. To achieve the aim, the following specific research tasks were set: 1) to describe the distinctive characteristics of the disabled unemployed and the measures aimed at tackling disabled unemployment; 2) to analyse the key demographic and socio-economic indicators related to the disabled unemployed and the participation of the disabled unemployed in activate employment measures in Latvia and Zemgale region in the period 2008-2016; 3) to identify the ways of enhancing employment opportunities for the disabled unemployed in Zemgale region.

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

The research methods employed: analysis and synthesis, induction and deduction, monographic, graphic and statistical analysis.

Research results and discussion

Employment is the key economic problem in any society, and it always causes a broad social and political resonance; it represents the extent of use of the labour force, yet the scope and mechanisms of promoting employment have been diverse in various periods of time.

Before the Great Depression in the 1930's, a number of famous classical economists of the end of the 19th and the beginning of the 20th centuries, among them the most prominent ones – D.Ricardo, J. Stuart Mill, A.Marshall et al. –, believed that a market system, in accordance with French economist Say's law and an assumption on price and wage elasticity, led to full resource utilisation in an economy, and full employment was a normal phenomenon of a market economy, while the best economic policy was no government intervention (McConnell C.R., Brue S.L., 1992). However, classical employment theories are contradicted by one essential fact – regular long unemployment and high inflation periods. British economist J.M.Keynes, in his 1936 book entitled the *General Theory of Employment, Interest and Money*, presented a new interpretation of employment, stressing that full employment was occasional rather than causal and that active government intervention was necessary to tackle unemployment problems and employment issues. J.M.Keynes's theory has become dominant one since the Great Depression; however, even though the theory was modified and supplemented, it, to a great extent, shapes the modern macroeconomic and employment theory (McConnell C.R., Brue S.L., 1992). The present research finds it to be true, as government employment policies get more purposeful and segmented, more ESF funding is involved, as well as the competence and role of local governments in providing social security to the population increase.

An indication of unemployment, which makes it a bigger problem than it was before, is the fact that the unemployed are concentrated in certain regions or the fact it is specific to some social groups (Stiglitz Dz.E., Drifils Dz., 1994). The present research focuses on the disabled unemployed in Zemgale region. Therefore, based on the theoretical findings on employment and unemployment and the status of the unemployed and the legal framework and support measures, it is important to identify the distinctive characteristics of the disabled unemployed and the measures to be taken to actively and meaningfully integrate them into the labour market and the society.

As regards the status of the unemployed, the same general requirements have to be applicable to granting this status to the disabled unemployed, yet the law has to stipulate that a disabled individual shall be considered to be a person being able to work; an exception is a disabled individual with a 100 % loss of ability to work (*Bezdarbnieku un darba mekletaju atbalsta...2002*), which has to be confirmed by a decision of the State Medical Commission for the Assessment of Health Condition and Working Ability to grant the status of the disabled or to determine the percentage loss of one's ability to work (*Bezdarbnieku un darba mekletaju statusa...2015*).

In the aspect of risk of unemployment, the disabled unemployed are at risk of unemployment and may be attributed to some type of unemployment – frictional, structural, cyclical or seasonal –, yet the factors and causes of the mentioned types of unemployment differently influence the situation of the mentioned group of the unemployed in terms of intensity, scope and complexity of the processes caused by their unemployment and in terms of their adaptation to the situation.

In the aspect of consequences of unemployment, the consequences caused by unemployment involve a loss of resources in the

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address:k.olszewska@pwsz.elblag.pl.

economy, a lower GDP growth rate and an increase in expenditure on unemployment benefits; however, at individual level, it results in a decrease in the standard of living and, what is particularly important, the unemployed disabled get socially excluded from the society, face the risk of loss of self-esteem and self-respect and, what is also important, it can endanger mutual relations within their families.

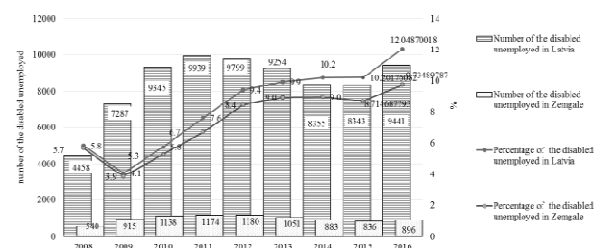
In the aspect of competition in the labour market in respect to the unemployed disabled, socio-economic consequences add to their functionality impairments that reduce the competitiveness of the unemployed disabled in the labour market in general and in comparison with the other groups of the unemployed.

In the aspect of active employment measures, it is of great importance for the unemployed disabled to be involved in measures targeting certain social groups (Bezdarbnieku un darba mekletaju atbalsta...2002), which provide government-subsidised jobs for the unemployed in order to help them comprehend labour market requirements, to contribute to their integration into the society and to help them find permanent jobs. Employers and managers who hire or work with the disabled are paid monthly subsidies during the period of the measure implemented and subsidies for the adaptation of a workplace as well as covered costs of sign language interpreter and ergo-therapist services by the SEA (Noteikumi par aktīvo nodarbinātības pasākumu..., 2011). Complex support measures are of great importance, which involve individual and group counselling sessions provided by specialists (psychologists and psycho-therapists), thereby contributing to the self-esteem of the disabled and their integration into the labour market (Noteikumi par aktīvo nodarbinātības pasākumu..., 2011).

In the aspect of preventive unemployment measures, it is important to engage individuals being at risk of unemployment in training – adult education programmes – and the training

providers have to be eligible for full compensation for their service costs at an amount that does not exceed the amount prescribed by the legislation (Noteikumi par aktīvo nodarbinātības pasākumu..., 2011).

In the context of identification of employment opportunities for the disabled unemployed, it is important to perform a detailed analysis of demographic and socio-economic indicators related to this social group and of their participation in active employment measures in terms of annual change in both number and percentage.



Source: authors' construction based on data of the CSB

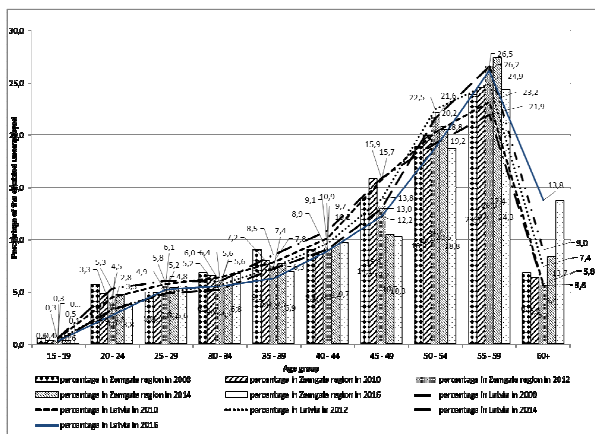
Fig. 1. Number and percentage of the disabled unemployed in Zemgale region in the period 2008-2016

As shown in Figure 1, the number of the disabled unemployed doubled in Latvia in the nine-year period, while in Zemgale their number increased 1.8 times. The proportion of the disabled unemployed in the total number of the unemployed rose to 12 % in Latvia, and this group took third position behind the unemployed aged 50 and over (37 %) and the long-term unemployed (30 %) (Parskats par bezdarba ...2015). Over the same period in Zemgale region, the proportion of the disabled unemployed increased by 4 %-points, reaching 9.7 % in 2016, which was 2.3 %-points lower than in Latvia as a whole. The highest figures – both nationally and regionally – were reported during the economic crisis and the post-crisis period, yet the increases were affected by the fact that in 2009 the disabled unemployed actively sought to acquire the status of the unemployed in order to use the opportunity to participate in the "Measure for certain groups of individuals".

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

The authors' calculations showed (Figure 2) that at both national and regional levels, the number of the disabled unemployed aged 40-60 and older comprised approximately three quarters of the total number of the disabled unemployed, and the percentage was considerably higher for the age group of 45-49 years, reaching a maximum at the age of 55-59 years. In the period of analysis in the region, the proportion of the disabled unemployed of this age was almost 10 %-points higher than that of the 10-year younger disabled unemployed, while nationally it was 6 %-points higher; in 2016 both nationally and regionally the disabled unemployed aged 55-59 comprised more than a quarter of the total disabled unemployed. The changes in the other age groups ranged within 2-3 %-points; an exception was the age group of 60 and older, the proportion of which increased by 7-8 %-points in the region and in Latvia as a whole over the last nine years, reaching 14 %, which was the third highest percentage across the age groups.

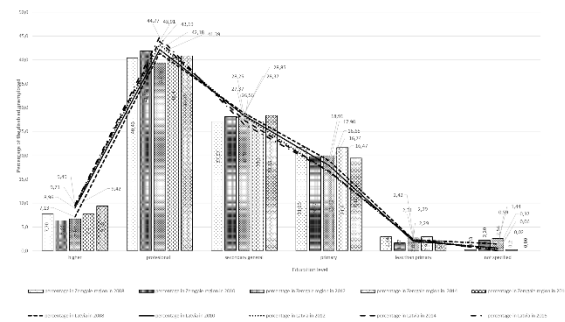


Source: author's calculations based on data of the SEA

Fig. 2. Percentage distribution of the disabled unemployed by age group in Latvia and Zemgale region in the period 2008-2016

An analysis of the education levels of the disabled unemployed (Figure 3) shows that the smallest changes were observed in the percentage of those with higher education; in Zemgale region, their proportion increased by 4 %-points, while nationally it increased by 3 %-points. In the result, almost one in ten disabled unemployed individuals had higher education in

2016. The proportions of the other education level groups of the disabled unemployed changed within 2-3 %-points both nationally and regionally. The highest proportion was reported for the disabled unemployed with professional education – 40 % and general secondary education – 27 %, while almost one in five disabled unemployed individuals had primary education.



Source: author's calculations based on data of the SEA

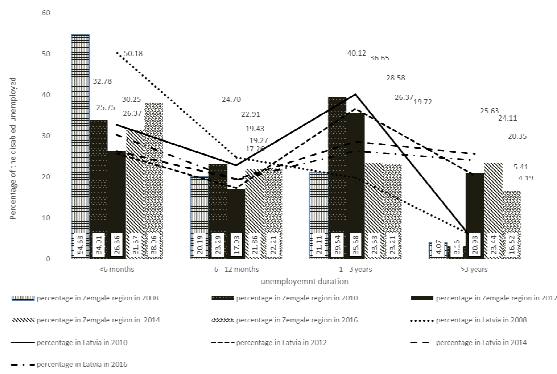
Fig. 3. Percentage distribution of the disabled unemployed by education level in Latvia and Zemgale region in the period 2008-2016

An analysis of unemployment duration of the disabled unemployed (Figure 4) confirms that no steady trend was observed in the period of analysis. Both nationally and regionally, the smallest changes were reported for those being unemployed for 6-12 months, whereas the greatest changes were specific to those being unemployed for more than three years – their proportion increased by more than 12 %-points in Zemgale and 19 %-points nationally. The greatest increase in the proportion of those being long-term disabled unemployed was reported in 2012 when it was 56 % higher both nationally and regionally; however, in 2016 in Zemgale it was 10 %-points lower than nationally, i.e. 40 % and 51 %, respectively. The economic crisis made the greatest influence on the disabled being unemployed for 1-3 years – their proportion increased by 20 %-points nationally and 18 %-points regionally in the period 2008-2010.

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

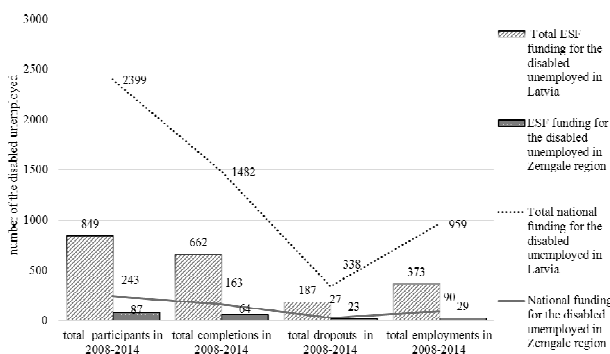
Jelgava, LLU ESAF, 27-28 April 2017, pp. 235-241 conducted in the period from 1 December 2015 to 12 February 2016 (Bezdarbnieku skaitis sadalījuma..., s.a.). There were randomly surveyed the registered disabled unemployed from two republican cities – Jelgava and Jekabpils – and 20 municipalities. The questionnaire included 16 both open and closed questions.



Source: author's calculations based on data of the SEA

Fig. 4. Percentage distribution of the disabled unemployed by unemployment duration in Latvia and Zemgale region in the period 2008-2016

Nationally and regionally in the period 2008-2014, three times more disabled unemployed individuals were involved in the national government-funded "Measure for certain groups of individuals" (Figure 5) than in an analogous ESF-co-funded measure. The proportion of those who completed the ESF-co-funded project was higher – 12 %-points nationally and 7 %-points regionally – than for the national government-funded project; however, the proportions of those who found jobs were 8 and 10 %-points, respectively, lower than for the national government-funded project.



Source: author's calculations based on data of the SEA

Fig. 5. Participation of the disabled unemployed in the ESF- and national government-funded "Measure for certain groups of individuals" in Latvia and Zemgale region in the period 2008-2014

To identify a range of employment opportunities to be enhanced for the disabled unemployed, a survey of 152 disabled unemployed individuals registered with the Zemgale regional department of the SEA, which accounted for 17 % of their total number, was

The respondent replies indicated that:

- almost half of them got disabled within a 1-10-year period, a third – within a period of more than 10 years, more than a fifth had been disabled since their childhood, which requires implementing national-scale measures to contribute to health as an important component of life quality and human capital;
- 82 % mentioned that before acquiring the status of the disabled unemployed they worked in one or several professions and had certain work experience; half of the potential employees were ready to do any job, which was important for their self-esteem;
- 65 % confirmed that the SEA could help find a job; 60 % were offered to engage in the "Measure for certain groups of individuals", while almost a third denied that; nevertheless, in general, the participation in active employment measures was diverse and might be viewed as positive and promoting employment;
- factors hindering employment were as follows: disability, reluctance of employers to assume responsibility, lack of vacant jobs, an opinion that a disabled individual was not able to perform work at high quality, lack of work experience – 57, 47, 32, 30 and 20 %, respectively.

The interviews of 19 representatives of enterprises and institutions in Zemgale region conducted in person and by phone, which represented randomly selected 12 municipalities of the region and two republican cities – Jelgava and Jekabpils – and diverse forms of business

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

organisation – both service and goods industries in about equal proportions – revealed that 95 % of the employers were informed about the opportunities provided by the SEA, 84 % of them employed or had employed disabled individuals, 74 % were involved in SEA activities that were considered to be beneficial. The main factors that hindered them from getting involved in the SEA activities were as follows: "large bureaucracy" during the implementation of an activity, the long period of evaluation, high requirements for reporting on funds spent, inability to provide a job for two years, no guarantee that an appropriate employee was selected. If employing the disabled without being involved in SEA activities, the employers wished tax relief and additional support from the government.

The findings made in the survey and interviews allow concluding that the ways of enhancing employment opportunities for the disabled are associated with reduction in the administrative burden and more active use of fiscal policy instruments by employers that employ the disabled as well as the use of more diverse activities and the implementation mechanism of the measures, based on foreign experience, to integrate the disabled unemployed in the labour market and the social life.

Conclusions, proposals, recommendations

1) The specifics of acquiring the status of the disabled unemployed is associated not only with the greater risk and consequences of unemployment for the disabled and their lower competitiveness in the labour market

but also active employment and preventive unemployment measures that have to ensure that the mentioned target group is integrated into the labour market and the social life and the risks caused by disability are reduced.

2) Nationally and regionally in the last nine years, the proportion of the disabled unemployed in the total number of the unemployed increased; the highest proportion was specific to the disabled unemployed aged 45-59, having professional education and being long-term unemployed, which stresses the necessity for broader involvement of them, based on their individual skills and competences, into the national government- and ESF-funded "Measure for certain groups of individuals", in which one in ten participants that completed the project and found a job in the period 2008-2014 came from Zemgale region.

3) The enhancement of employment opportunities for the disabled unemployed in the region is associated with the necessity to nationally introduce tax relief for employers that employ the disabled, while local governments have to promote social entrepreneurship and to involve mentors for the disabled. The SEA has to provide subsidised jobs for a shorter period (6 months) and to unburden enterprises of the great number of inspections and regular reports to be submitted in paper format. The mass media have to popularise the best examples of how the disabled unemployed found permanent jobs.

Bibliography

1. Stiglics, Dz., Drifils, Dz. (1994). Makroekonomika. Latvijas Universitate, saisinats tulkojums (Macroeconomics. Short translation. University of Latvia). Riga: Original published by: Norton&Company, Inc., p. 415.
2. Angela, B.M. (2015). Employment of Persons with Disabilities. *Procedia - Social and Behavioral Sciences*, Vol: 191, pp. 979-983.
3. Bezdarbnieka un darba mekletaja statusa pieskirsanas kartiba un statusa pieskirsanai nepieciešamie dokumenti (2015): Ministru kabineta 2015. gada 24. februara noteikumi Nr.103. (Procedures for Granting the Status of an Unemployed Person and the Status of a Person Seeking Employment and the Documents Necessary for the Granting of the Status. Cabinet Regulation No. 103 of 24 February 2015). Retrieved: <http://likumi.lv/ta/id/272483-bezdarbnieka-un-darba-mekletaja-statusa-pieskirsanas-kartiba-un-statusa-pieskirsanai-nepieciešamie-dokumentu>. Access: 12.01.2017.
4. Bezdarbnieku un darba mekletaju atbalsta likums (2002): LR likums (Support for Unemployed Persons and Persons Seeking Employment Law). Retrieved: <http://likumi.lv/doc.php?id=62539> Access: 10.01.2017.

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

5. Eiropas stratēģija invaliditātes joma (2010–2020); atjaunināta apņemsanas veidot Eiropu bez šķēršļiem, (2010) (European Disability Strategy 2010-2020: A Renewed Commitment to a Barrier-Free Europe). Retrieved: <http://eurlex.europa.eu/legalcontent/LV/TXT/PDF/?uri=CELEX:52010DC0636&from=LV> Access: 16.01.2017.
6. Iekļaušanas nodarbinātības pamatnostādnes 2015.-2020.gadam (2015). Ministru kabineta 2015. gada 12.maija rīkojums Nr.244 (Inclusive Employment Guidelines 2014-2020. Cabinet Decree No. 244 of 12 May 2015). Retrieved: <http://likumi.lv/ta/id/273969-par-ieklausosas-nodarbinatibas-pamatnostadnem-2015-2020-gadam> Access: 16.01.2017.
7. Konvencija par personu ar invaliditāti tiesībām (2006) (Convention on the Rights of Disabled Individuals). Retrieved: <http://likumi.lv/doc.php?id=205328> Access: 18.01.2017.
8. Latvijas ilgtspējīgas attīstības stratēģija līdz 2030. gadam (2010) (Sustainable Development Strategy of Latvia until 2030). Retrieved: http://providus.lv/article_files/2871/original/latvija2030_lv.pdf?1426753617 Access: 03.01.2017.
9. Latvijas Nacionālais attīstības plāns 2014-2020. gadam (2012): Vides aizsardzības un reģionālās attīstības ministrija (National Development Plan of Latvia 2014-2020. Ministry of Environmental Protection and Regional Development). Retrieved: http://www.pkc.gov.lv/images/NAP2020_%20dokumenti/20121220_NAP2020_apstiprinats_Saeima.pdf Access: 06.01.2017.
10. Noteikumi par invaliditāti apliecināsa dokumenta paraugu, dokumenta izsniegšanas un uzskaites kārtību (2012): Ministru kabineta 2012.gada 26.jūnija noteikumi Nr.450 (Regulations Regarding the Document Specimen Certifying Disability, the Procedures for the Issuance and Record-keeping of the Document. Cabinet Regulation No. 450 of 26 June 2012). Retrieved: <http://likumi.lv/ta/id/249985-noteikumi-par-invaliditati-apliecinosa-dokumenta-paraugu-dokumenta-izsniegšanas-un-uzskaites-kartibu> Access: 18.01.2017.
11. Pārskats par bezdarba situāciju valstī. 2016. gada janvārī, (2016) (Report on Unemployment in the Country as of January 2016). Retrieved: http://www.lm.gov.lv/upload/statistika/parskats_par_bezdarba_situaciju_valsti_2016_gada_janvaris_2202.pdf Access: 27.12.2016.
12. Pasākums noteiktām personu grupām, 2015 (Measure for certain groups of individuals). Retrieved: <http://www.nva.gov.lv/index.php?cid=433&mid=437&txt=2926> Access: 05.01.2017.
13. McConnell C.R., Brue S.L. (1992) Economics. Principles, Problems and Policies (in Russian). vol. 1, Moscow: Republic, p. 399.

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

ANALYSYS OF SELECTED DETERMINANTS OF THE AGRICULTURAL MARKET IN LATVIA AND POLAND

Anetta Wasniewska¹, Ph. D.; Katarzyna Olszewska²

¹Gdynia Maritime University, ²The University of Applied Sciences in Elbląg

Abstract. On the agricultural market, many factors are determined by the current changes. As a result, there has been an increase in competitiveness and productivity in the agricultural sector in many countries of the European Union, which is inhabited by almost 7 % of the total population of the world, and comprises 2.1 % of the world's land surface. It is not a homogeneous region as regards the level of the agricultural market development, especially the milk market.

Since 2004, when Latvia and Poland joined the European Union, the production of cow's milk has risen in spite of the decrease in the population of dairy cattle which has been accompanied by increased efficiency. The decline in consumption of cow's milk and its products, on the other hand, is an unfavourable phenomenon.

The aim of the research was to identify the key determinants that influence the milk market in Latvia and Poland. In order to achieve the research objective, the authors have conducted an analysis of the Common Agricultural Policy documents associated particularly with the dairy market. The authors defined the set of agricultural market's determinants in order to achieve the set goal. The research was based on Eurostat data generated for years 2005-2013. Twenty eight variables were used for analysis. A number of determinants were eliminated on the basis of coefficient of variation. The remaining variables were used for conducting examinations involving Hellwig's method to determine the value of the integral capacity of information carriers.

According to the analysis, the dairy market in Latvia is considerably influenced by the number of cattle, the age of farmers and agricultural holdings by economic size. The Polish dairy market is affected by the agricultural holdings with agricultural area of less than 5ha and agricultural holdings with the economic size of the farm less than 4000 euro.

Key words: agricultural market, milk, determinants

JEL code: Q13, Q18, C43

Introduction

The Common Agricultural Policy reforms were caused by the changes on the European Union milk market, which occurred at the beginning of the 21st century.

The increased competitiveness in the world, enlargement of the European Union, changes in the global output, in the consumption and the demand for milk and milk products led to transformations in cattle raising.

Productivity from one cow is more significant than the size of the herd.

The implemented reforms are expected to contribute to increased efficiency, innovation and realignment of the situation on the milk market, which in turn will contribute to the growth of competitiveness.

The authors attempted to identify the determinants that have the most significant influence on the milk market in Latvia and

Poland, especially in the period after the accession of these countries to the European Union.

The importance of actions which have been taken under the Common Agricultural Policy is emphasized in literature. However, the authors of this article focused on available Eurostat data for years 2005-2013 and, by means of the Hellwig's method, defined the determinants that have the greatest influence on the dairy market in the analysed countries.

1. Common Agricultural Policy

The experience of many countries shows that agriculture is a very sensitive sector which requires special treatment, special protection and support.

The fact is that agriculture does not provide a return on invested capital as fast as in other sectors of economy. The entire production cycle is longer and agricultural production often

¹ Anetta Wasniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

depends on factors beyond the control of man, like e.g. weather conditions. Therefore, in the process of creating the Euromarkets, it was recognized that the agriculture sector should be treated in a special way.

Historically the Common Agricultural Policy, was one of the first socio-economic policies of the European Union. The decision to introduce Common Agricultural Policy was included in The Treaty of Rome establishing the European Economic Community (Burnat M., 2001). The objectives of the Common Agricultural Policy in the European Union were determined as follows (Official Journal of EU, 2012; Gawlikowska-Hueckel K., 2003, Rowinski J., 2000):

- raising the productivity based on implementation of technological progress and development of agricultural production based on optimum use of all production factors;
- ensuring fair standard of living for the farmers;
- securing market stabilization;
- securing safety in food supply;
- securing prices of agricultural-food products acceptable to the consumers.

These aims should be achieved by a common organization of agricultural markets, vocational training of farmers, agricultural research, dissemination of agricultural knowledge as well as implementations of measures which will stimulate consumption of certain agricultural products.

The solutions to current and long-term problems of agriculture or other sections of the food economy are aided by the Common Agricultural Policy.

The Europeanization of legislation may take the form of coordination of the national agricultural markets, which will guarantee the integration and functioning of the common organization of agricultural markets.

The common market organisation of the milk and dairy products is one of the first, having been created in 1968 as part of the Common

Agricultural Policy. Community policy on the milk market is based on the goals of the Common Agricultural Policy.

At the same time, implementation of all aims is difficult; therefore, a hierarchy of priorities set for individual markets and their organizations may change over time.

As regards the common organization of the milk market, provisions relate primarily to:

- balancing the milk market. The balance refers to matching supply with demand on the milk market and reducing structural surpluses;
- ensuring a fair standard of living for the agricultural community (Official Journal of EU, 2012), in particular by increasing the individual earnings of persons engaged in agriculture;
- improving the milk and milk product's competitiveness on international markets; competitiveness must be attained, among others, by adjusting European prices to the world market prices, which are structurally lower (Regulation (EC), 1999, Regulation (EC) 2007).

The Common Agricultural Policy has enabled achieving food self-sufficiency of the Community and its Member States. Its cost was the expensive rise in surpluses of the production of agricultural commodities. This policy did not lead to the solution of structural problems in agriculture and its surroundings. Significant changes in the policy were caused by the high costs of its financing as well as protests of the global competitors and the preparations for the admission of new members from Central and Eastern Europe.

Substantial surplus production and the risks associated with food safety were the internal problems of the European Union. These problems were solved by introducing previous reforms, which resulted in favourable changes both within the EU group and in the international arena.

The recent reforms of agricultural policy of the European Union caused agriculture to become

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address:k.olszewska@pwsz.elblag.pl.

more market-oriented with simultaneous support for producers' incomes. Consistency of environmental protection requirements has been improved and the interest has grown in development of rural areas through extensive involvement in new projects for the countryside.

Taking the new trends into account, the reformed Common Agricultural Policy should become more balanced, better targeted, simpler and more efficient. It should respond to the needs and expectations of the European society, account for environmental aspects, climate, innovation, and natural constraints.

2. Dairy in the European Union

The most privileged sector in the European Union, which is regulated by many provisions of law is the milk and dairy products market.

The objective of the common milk market organisation is to limit of the overproduction of this raw material. This goal determines the main directions of the undertaken reforms, serves the purpose of ensuring price stability and sustaining farmers' income, supporting restructuring and modernization of the dairy sector, maintaining the balance of payments and sustaining economic growth. These numerous goals aim to fulfil the tasks of the Common Agricultural Policy and safeguard the interests of whole dairy industry.

The fundamental regulations of the milk market are instruments of market support. It is possible to divide them into three groups:

- 1) instruments affecting stabilization of the market (a system of guaranteed prices and intervention applied on the butter and skimmed milk powder markets);
- 2) instruments stimulating the domestic demand (subsidies to the consumption and processing of butter, powdered milks and creams);
- 3) regulations of the foreign trade (import duties, access limits and exports subsidies).

As a result, of all CAP reforms of the milk market, the milk target price was abandoned and, gradually, intervention prices for butter and skimmed milk powder (SMP) were reduced.

Procedures of intervention purchases were simplified, allowing them to be carried out within the limits set by the European Commission at a price equal to 90 % of the intervention price, regardless of the level of market prices. In addition, a decision was made to liquidate subsidies for SMP storage (which in practise had not been used for several years). Subsidy rates for processing milk fat by the food industry and for the use of milk protein for animal feed and casein were systematically lowered (Nitecka E, 2007; Seremak_Bulge J, 2008).

Purchase, intervention prices for butter and skimmed milk powder as well as private storage aid for butter, SMP and cheese are instruments which stabilize the milk market. The aim of the intervention mechanisms of purchases and sales of butter is to maintain balance due to collecting seasonal surplus and the sale of the accumulated intervention stocks during the period of reduced supply (Ginalska B., 2015).

The system of intervention along with subsidies creates a safety net, which is designed to prevent decline the market prices below a certain level. Purchases of butter are conducted exclusively within the tender system. They are activated at every time of the milk year when market prices of butter in one or more Member States within successive two weeks fall below 92 % of the intervention price. These measures are suspended when selling prices rise by more than 92 % of the intervention price (Commission Regulation 2771/1999). To participate in the tender, the producer must meet the quality criteria, and have a certificate of entitlement for production of butter within the intervention scheme.

Since 2010, lack of interest has been noted in the purchase mechanism because the prices of butter and SMP significantly exceed the intervention price for these products.

The response to the constantly changing demand are decisions concerning changes in butter production and distribution (Baer-

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address:k.olszewska@pwsz.elblag.pl.

Nawrocka, A., Grochowska, R., Kiryluk-Dryjska, E., Seremak-Bulge, J., Szajner, P., 2012).

In relation to dairy farms, for several years the market competition in the area of the uniform market was inhibited by the quota system (Judzinska A., Łopaciuk W., 2011), which was supposed to stabilize the market and to prevent emergence of surplus production. In fact, the system of production limitation led to a concentration in the industry, which was manifested by the reduction of the number of companies and increase in the scale of individual unit production (Sadowski A., Baer-Nawrocka A., Poczta W., 2013). Thus, the liquidation of quotas, which took place in 2015, will most probably

accelerate the concentration of producers in different EU countries. It may help to enhance competition and, more specifically, the competitive struggle between Member States and individual farms. This can lead to the reorganization of the production of raw material in Europe. According to Baer-Nawrocka and Kiryluk-Dryjska, the withdrawal from the quoting system will most probably contribute to the transfer of milk production to areas where the production will be possible at relatively low costs on account of favourable natural conditions (Baer-Nawrocka A., Kiryluk-Dryjska E., 2010; Report Agricultural and Rural Development, 2014).

Table 1

**Milk production and number of dairy cows in the European Union
in the years 1994-2014**

| Years | Total production (mln l)* | Production – annual increase (%) | number of dairy cows ** (in thousands) |
|-------|---------------------------|----------------------------------|--|
| 1994 | 123 784 | - | 22 526 |
| 2003 | 125 598 | 1.5 | 19 257 |
| 2004 | 146 539 | 16.7 | 25 256 |
| 2005 | 146 998 | 0.3 | 24 824 |
| 2006 | 145 284 | -1.2 | 22 268 |
| 2007 | 152 612 | 5.0 | 24 158 |
| 2008 | 153 863 | 0.8 | 23 951 |
| 2009 | 147 135 | -4.4 | 23 696 |
| 2010 | 148 960 | 1.2 | 23 073 |
| 2012 | 156 493 | 5.1 | 23 206 |
| 2014 | 154 470 | -1.3 | 23 500 |

* assuming the weight of 1 litre of milk to be 1.03 kg.

** status in December

Source: authors' study DG-AGRI, Eurostat, Milk market, status and prospects, IERIGZ-PIB, Warszawa 1999, 2008, 2013, 2014.

About 6.6 % of the world population inhabit the Member States of the European Union, whose area occupies 2.1 % of the earth's surface; and the cow's milk production constitutes almost 25 % of the world production. According to the International Dairy Federation estimates of milk production, in 2011 the EU contribution accounted for 83 % of global milk production (all kinds). Until 2003, farms produced from 120 - 125 million tonnes of milk, which was the result of the contemporary milk quota system in the group. The production rose up to 146 million tonnes (Table 1) after the next extension of the

EU, which took place in 2004 (10 countries). In relation to the scale of enlargement and milk quotas increase, it may seem to be only a slight rise.

In the literature on the subject, the size of the herd and milk efficiency of cows are considered to be the factors which determine the cost of milk production (Manko S., 2007; Switłyk, M., Zietara, W., 2012). The data presented in Table 1 shows that milk production in the EU increased within 20 years. In 2014 it was 154 mln litres and it was an increase by 24 % compared to 1994. The steadily growing cow milk unit's efficiency within

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

the whole EU may be viewed as a positive development as regards production efficiency, despite the cattle numbers decline which has been occurring since 2008.

3. Determinants of the milk market – the Hellwig's method

Latvia and Poland joined the European Union in 2004. Before accession, both countries benefited from aid programmes, which were aimed at improving the competitiveness of their economies. Among other things, actions of the EU aimed to improve the situation on the milk and dairy products market.

In 2004, Latvia produced 478.1 thousand tonnes of cow's milk, and in 2015 it was already a value of 807.66 thousand tonnes. A similar dynamic growth was recorded in Poland, where, respectively, in 2004 8151.4 thousand tonnes were produced, and in 2015 - 10,874.28 thousand tonnes.

Such dynamic changes occurring in the milk market, not only in Latvia and Poland, led to the transformation of the agricultural policy of the European Union. These changes affect not only milk production but also its processing and consumption.

The purpose of the study was to determine the main factors influencing changes in the milk market in Latvia and Poland.

The authors, in order to identify the determinants, generated from the EUROSTAT database those variables which are related to the milk market in the analysed countries for the years 2005-2013. This database allowed analysing and determining the market-related determinants.

The analysis focussed on selected determinants of the agricultural market with particular emphasis on the milk market. The exogenous variable was the total number of farms operating in each of the countries under analysis (agricultural holdings by agricultural area), and the endogenous variables were those listed in Table 2. A total of 28 endogenous determinants were identified. Next, due to the large size of the set, certain endogenous variables were eliminated. The coefficient of variation was used in order to eliminate variables.

Further analysis considered only those determinants which were characterised by the highest level of changeability. Further analysis concerned the following five factors for Latvia (accordingly X11, X12, X13, X14, X20) and for Poland (accordingly X1, X6, X10, X11, X17).

In the initial stage, the research method was the correlational analysis of the value of the Pearson linear correlation coefficient. The vector and matrix coefficients were created relative to the analysed variables of the milk market.

In order to define in detail the determinants for Latvia and Poland, the Hellwig's method was employed, which is based on the integral capacity of information carriers. The latter are defined as the potential explanatory variables. Subsequently, the number of possible combinations of potential variables is determined and for each combination, individual information capacity is calculated. In this case, for each of the countries under analysis, 31 combinations were calculated, according to formula 1 (Kowalik K., 2014).

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address:k.olszewska@pwsz.elblag.pl.

Factors shaping the milk market in Latvia and Poland

| Variable | Name | Variable | Name |
|----------|---|----------|--|
| X1 | Agricultural holdings by agricultural area less than 5 ha | X15 | Agricultural holdings by age of holder from 45 to 54 years |
| X2 | Agricultural holdings by agricultural area from 5 to 19.9 ha | X16 | Agricultural holdings by age of holder from 55 to 64 years |
| X3 | Agricultural holdings by agricultural area from 20 to 49.9 ha | X17 | Agricultural holdings by age of holder 65 years or over |
| X4 | Agricultural holdings by agricultural area from 50 to 99.9 ha | X18 | Agricultural holdings with livestock (cattle) |
| X5 | Agricultural holdings by agricultural area 100 ha or over | X19 | Agricultural holdings by crops (fodder crops) |
| X6 | Agricultural holdings by economic size of the farm less than 4000 euro | X20 | Agricultural holdings with livestock (number of holdings with livestock) |
| X7 | Agricultural holdings by economic size of the farm from 4000 to 14999 euro | X21 | Selling prices of raw cow's milk (EUR per 100 kg) |
| X8 | Agricultural holdings by economic size of the farm from 15000 to 49999 euro | X22 | Production of cheese (1000 t) |
| X9 | Agricultural holdings by economic size of the farm from 50000 to 99999 euro | X23 | Production of butter (1000 t) |
| X10 | Agricultural holdings by economic size of the farm from 100000 to 249999 euro | X24 | Production of milk powder (1000 t) |
| X11 | Agricultural holdings by economic size of the farm from 250000 to 499999 euro | X25 | Production of meat: cattle (1000 t) |
| X12 | Agricultural holdings by economic size of the farm 500000 to over euro | X26 | Production and utilisation of milk on the farm (1000 t) |
| X13 | Agricultural holdings by age of holder less than 35 years | X27 | Collection of cow's milk (1000 t) |
| X14 | Agricultural holdings by age of holder from 35 to 44 years | X28 | Number of dairy cows |

Source: author's calculations based on ... (as an example)

Fig. 1. Determination of the combination

$$L = 2^m - 1 \quad (1)$$

Where:

m - the number of explanatory variables.

Further, the individual capacity is determined according to formula 2.

Fig. 2. Determining the individual capacity

$$h_{lj} = \frac{r_j^2}{\sum_{i \in I_l} |r_{ij}|}, \quad l = 1, 2, \dots, L, \quad j \in I_l \quad (2)$$

Where:

r_j - correlation between *Y* and *x_j*

r_{ij} - correlation between *x_i* and *x_j*

Subsequently determining the information capacity for all explanatory variables occurring for *l*th combination according to formula 3.

Fig. 3. Determining the information capacity for explanatory variables

$$H_l = \sum_{i \in I_l} h_{ij}, \quad l = 1, 2, \dots, L \quad (3)$$

Where:

H - integral capacity of the information carrier

Based on the obtained calculations, it was possible to define the determinants which have the greatest influence on the development of the milk market in Latvia. These include X14 and X20. This result indicates that on the Latvian milk market stocking and the age of people running farms have the biggest impact. In the case of Latvia, they are the farm owners aged 35-44. It should also be noted that the high values of Hellwig method information capacity was observed in the case of agricultural holdings with economic size of the farm from 250 000 to 499 999 euro.

The analysis conducted for Poland, returned X1 and X6. The Polish milk market is primarily

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address: k.olszewska@pwsz.elblag.pl.

influenced by agricultural holdings of agricultural area less than 5 ha and agricultural holdings of economic size of the farm less than 4000 euro. This result is surprising because in Poland milk production is primarily the domain of farms which are large in terms of area and income obtained. In addition, high information capacity value was obtained for agricultural holdings with the holder's age 65 years or over. Depopulation of rural areas is clearly visible in Poland. Farms are run by older people, and, in many cases, there is no substitutability of generations understood as inheriting the parental farms.

A noteworthy fact is that the data which were used for the analysis of both countries do not contain information concerning the production of milk powder in Latvia. EUROSTAT reports that these data are confidential. This situation does not concern only Latvia but also other Baltic states of the former Soviet Union.

Conclusions

The issues related to the Common Agricultural Policy in the milk market are of interest not only to the producers (suppliers of milk) but also food

processing businesses and consumers. In the article, in order to determine the determinants, the authors used a simple and transparent synthetic indicator, which enables calculating the integral capacity of the information carriers. This method can be used to determine the dependencies occurring between the analysed exogenous and endogenous variables.

The determinants obtained by means of the Hellwig's method also show the specificity of milk production in Latvia and Poland despite the fact that the two countries differ in terms of size, e.g. the number of farms, livestock, milk production and dairy products.

It is worth noting that, as a result of this analysis, the determinants related to the milk market, as determined by the examination of integral capacity of information carriers, coincide with the current Common Agricultural Policy carried out by the Community on the milk market and show the current trends. The result may be a better use of the available funds for restructuring and modernization of the dairy sector in the two countries that have been analysed.

Bibliography

1. Baer-Nawrocka A., Kiryluk-Dryjska E., Wpływ likwidacji kwot mlecznych na sytuację produkcyjną i ekonomiczną producentów mleka w Unii Europejskiej (wyniki symulacji modelowych), (The impact of the liquidation of milk quotas on production and economic situation of milk producers in the European Union (the results of model simulations), *Więś i Rolnictwo* nr 2/2010, pp. 135-147.,
2. Baer-Nawrocka, A., Grochowska, R., Kiryluk-Dryjska, E., Seremak-Bulge, J., Szajner, P., Światowy rynek mleka i jego wpływ na polskie mleczarstwo po zniesieniu kwot mlecznych, (The global market for milk and its impact on the Polish dairy sector following the abolition of milk quotas), *IERiGZ*, Warszawa 2012, p. 20.
3. Burnat M., Wspólna Polityka Rolna Unii Europejskiej, Zrozumieć negocjacje, (The Common Agricultural Policy of the European Union, Understanding negotiations), *Rolnictwo*, Warszawa 2001, p.11.
4. COMMISSION REGULATION (EC) No 2771/1999 of 16 December 1999 Laying down Detailed Rules for the Application of Council Regulation (EC) No 1255/1999 as Regards Intervention on the Market in Butter and Cream
5. COUNCIL REGULATION (EC) No 1234/2007 of 22 October 2007 Establishing a Common Organisation of Agricultural Markets and on Specific Provisions for Certain Agricultural Products (Single CMO Regulation)
6. COUNCIL REGULATION (EC) No 1255/1999 of 17 May 1999 on the Common Organisation of the Market in Milk and Milk Products
7. Gawlikowska – Hueckel K., Procesy rozwoju regionalnego w Unii Europejskiej Konwergencja czy polaryzacja, (The processes of regional development in the European Union Convergence or polarization), Uniwersytet Gdański, Gdansk 2003, p.187.
8. Ginalska B., Deregulacja unijnego rynku mleka – szanse i zagrożenia dla polskiego mleczarstwa, (Deregulation of the EU milk market - opportunities and threats for the Polish dairy industry), *e-Biuletyn* kwiecień 2015, Centrum Doradztwa Rolniczego w Brwinowie, pp.15-16;
9. Judzińska A., Lopaciuk W., Wpływ Wspólnej Polityki Rolnej na rolnictwo, (The impact of the Common Agricultural Policy on agriculture), *IERiGZ – Państwowy Instytut Badawczy*, Warszawa 2011, pp.20-22.
10. Kowalik, K., On an Implementation of the Method of Capacity of Information Bearers (the Hellwig method) in spreadsheets, in: Banek, T. and Kozłowski, E., ed.: *Probability in Action*, Politechnika Lubelska, Lublin 2014, pp. 31-40

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address:k.olszewska@pwsz.elblag.pl.

11. Manko, S., Wpływ wielkości stada i wydajności jednostkowej krow na koszty produkcji mleka, (The impact of herd size and productivity of cows on the unit cost of milk production), *Roczniki Nauk Rolniczych 2007*, Seria G., T 93, z. 2, pp. 37 – 44.,
12. Nitecka, E., Przewidywane zmiany unijnej polityki i jej wpływ na sektor mleczarski w nadchodzących latach, (Projected changes in EU policy and its impact on the dairy sector in the coming years), *Przegląd Mleczarski 4/2007*, pp.21 -23
13. Official Journal of the European Union, the Treaty on the Functioning of the European Union, 2012 art. 39.,2012/C 326/01
14. Prospects for EU Agricultural Markets and Income 2014-2024, *Report Agricultural and Rural Development*, European Commission, December 2014, p.35.
15. Rowinski J., Wspólna Polityka Rolna Unii Europejskiej, (The Common Agricultural Policy of the European Union), FAPA, Warszawa 2000, s.7.
16. Sadowski A., Baer-Nawrocka A., Poczta W., Gospodarstwa rolne w Polsce na tle gospodarstw Unii Europejskiej – wpływ WPR, (Farms in Poland and the European Union farms - the impact of the CAP.) Praca zbiorowa pod kierunkiem prof. dr hab. Walentego Poczty. Główny Urząd Statystyczny, Warszawa 2013, s.130.
17. Seremak-Bulge, J., Wpływ kwotowania na funkcjonowanie rynku mleka, in: Kowalski, A., Wigier, M., Rozwoj sektora rolno-spożywczego w Polsce na tle tendencji światowych, (The impact of quotas on the functioning of the milk market: Development of the agri-food sector in Poland against the background of global trends), IERiGŻ, Warszawa 2008, pp. 35 – 40.
18. Switłyk, M., Zietara, W. (red.) Analiza efektywności produkcji mleka i żywca wołowego. (Analysis of the efficiency of production of milk and beef) *Raport 2012*, Wydawnictwo SGGW, Warszawa 2012.
19. Wronski, M., Mechanizmy Wspólnej Polityki Rolnej na rynku mleka i przetworów mlecznych, (The mechanisms of the Common Agricultural Policy on the market in milk and milk products), *Biuletyn Informacyjny ARR, 4/ 2007 (190)*, Warszawa 2007, p. 13.
20. Zietara, W., Ekonomiczne i organizacyjne problemy produkcji mleka przy wysokiej wydajności jednostkowej, (Economic and organizational problems of milk production at the high-performance unit) *Roczniki Nauk Rolniczych 2007*, Seria G, T. 93, z. 2, pp. 27 – 36.

¹ Anetta Waśniewska, Gdynia Maritime University, Tel. +0048 605 570 568, e-mail address: a.wasniewska@wpit.am.gdynia.pl

² Katarzyna Olszewska, The University of Applied Sciences in Elbląg, Tel.: +0048 691 464 035. E-mail address:k.olszewska@pwsz.elblag.pl.

ECOLOGICAL EDUCATION FOR SUSTAINABLE DEVELOPMENT OF RURAL AREAS

Izabela Wielewska¹, PhD.; **Maciej Gliniak**², PhD. Eng.; **Wiktoria Sobczyk**³, PhD. D.Sc. Eng.
Associate Professor; **Piotr Prus**⁴, PhD. Eng

^{1,4}UTP University of Science and Technology in Bydgoszcz; ²University of Agriculture in Krakow; ³AGH University of Science and Technology in Krakow

Abstract. The specific system of processing the natural resources, which has evolved throughout centuries, has made the globe a large industrial centre and an area of intensive agricultural exploitation – which both constitute considerable burden for the natural environment. The consequences of the anthropogenic impact on the environment, which trigger harmful degradation of the environmental balance, call for firm counteraction as well as an increase in the environmental awareness. One of the sources of the increase in responsibility for the environment is the education for sustainable development. It should negate the consumerist character of existence and focus on environmental values both in agriculture and daily life. It should also make social norms subordinate to those values. Thanks to education on different levels, the society has a possibility to gain knowledge in sustainable development, also that of rural areas.

The aim of this article is to present students' opinions on education for sustainable development of rural areas. Research conducted included a diagnostic survey in a group of 144 students, who attend agriculture-profiled classes, in their final years of secondary schools from Counties of Chojnice and Człuchow.

The research has shown that the issues of education for sustainable development in rural areas do concern the youths, especially in the environmental aspect. The students notice the presence of these issues, they appear to have a certain level of environmental awareness and some of the aspects of sustainable development.

It is necessary to constantly broaden children's, youths' and their teachers' educational capabilities, including study of responsibility for the environment and sustainable development of rural areas.

Key words: environmental education, education for sustainable development, rural areas.

JEL code: Q01, Q56, I29

Introduction

Agriculture in Poland serves as the most important economic element of rural areas. Along with forestry, it is the sector of economy that significantly shapes the natural conditions and affects the state of the environment. Changes that have occurred in Polish agriculture have been related to the great need of restructuring of the agriculture and rural areas as well as European Union integration. They have brought about an increase in various dangers. There was a trend for the maximisation of profit (according to the principles of market economy), which led to the demise of small and highly specialized farms. In turn, the imperative to increase the crop yield resulted in an increased use of herbicides, pesticides and artificial fertilizers (Adamowicz, 2006). Some negative effects of this kind of activity are not only the contamination of the soil and water with chemicals, but also the creation of large monoculture areas, degradation of pastures and meadows, and destruction of tree

populations and small ponds – consequently, the impoverishment of biological variety (Kowalczyk-Jusko, 2005). It became necessary to undertake urgent precautions and make a reflection on the directions of today's change and its stimuli for the development of the civilisation of the world. This also concerns rural areas (Roman, 2014a).

Sustainable development of rural areas should include a reasonable management of resources, proper production profiling, and mobility control. The changes in the course of intensive farming also meant a rapid increase in unemployment rates in the country and even greater difficulty selling the crops. At the same time, this most anti-environment form of agriculture would lead to a considerable increase in severe pollution of the soil, surface and ground waters, as well as quick impoverishment of wildlife (Adamowicz, 2006). In turn, sustainable farming is aimed at such use of the natural resources that will not destroy their natural sources, but allows the satisfaction of the needs of future generations of

producers and consumers (Wielewska, 2006). Its essence is such activity of individuals that does not jeopardize long-term interest of the community.

The concept of sustainable development plays an important role in levelling the causes of the environmental deadlock. This concept has been described as *the right to satisfy the developmental aspirations of the present generation without limiting the rights of the future generations to satisfy their developmental aspirations* (Drelichowski, 2001). It is clear from this definition that economic and civilisation development of the present generation should not progress at the expense of the depletion of non-renewable resources and the destruction of the environment, for the sake of the future generations (Drelichowski, 2001). It is based on some key notions: basic needs and limited capabilities, particularly the endurance of the global ecosystem. With reference to the needs – it particularly concerns the basic needs of the poorest in the world, which require the highest priority. When speaking of limitations – it is about the existing (imposed) potential of the environment to satisfy both the present and future needs by the state of technology and social organization (Roman, 2014b). According to the idea of sustainable development, the society ought to live whilst taking into account the calculation of the cost of its decisions (Runowski, 2004).

With the advent of the idea of sustainable development, a necessity arose for another approach towards the very essence of development, both ecological, social and economic (Zuzek, 2010). This reorientation assumed, amongst others, the conformity with the environment or friendliness towards the environment, the popularisation of the development of new technologies in environmental protection, the creation of improvement and innovative activities, the necessity to preserve the resources and

contribution to the reduction of pollution, the limitation of the amount and toxicity of waste as well as favouring the extension of the variety of pro-environmental behaviours (Sieminski, 2008).

It must also be noted that the principles of fully sustainable development pertain to the following criteria:

- respect and care for local communities;
- improvement in the quality of life;
- more effective protection of essential and varied resources of the Earth;
- minimisation of the use of the non-renewable resources;
- exploitation of the natural resources of the Earth within reasonable limits;
- transformation of customs and individual practices of inhabitants;
- access for local communities to possibilities of protecting their own environment;
- on the level of the state – creation of the basis for the integration of economic growth and environmental protection;
- on the global level – creation of an alliance in the aspect of environmental behaviours (Prus, 2010).

One of the factors that determine sustainable development is environmental education.

The research was conducted with the use of the diagnostic survey. The aim of the research was to present the opinions of secondary school students on the issues of education for sustainable development of rural areas.

The research touched upon the following questions:

- 1) How do the surveyed identify the notion of *sustainable development of rural areas*?
- 2) How do the students assess the level of their own environmental awareness and knowledge of sustainable development and its usefulness?
- 3) Where do they look for the sources of knowledge of sustainable development?

The survey research was conducted in a group of 144 students of final grades of secondary

schools in the Counties of Chojnice and Człuchow, who attend agriculture-profiled classes. The purposefulness of the exclusive selection of the youths from agriculture-profiled classes arose from the subject of the research, which oscillated around sustainable development of rural areas.

The research procedure was first discussed with the teachers of the selected classes. Then the research was conducted. The students were given questionnaires, which they filled out for about 20 minutes. Before the commencement of the survey, the youths had been informed about the purpose and anonymity of the research. The research was conducted in December 2014 and its results were ordered; then, the results were analysed qualitatively and quantitatively.

Research results and discussion

The effective environmental protection is possible when the entire society is involved in cooperation.

In the relation of man and nature, the suppression of negative phenomena conditioned by instrumental pragmatism creates the need to provide the society not only with knowledge of the functioning of the environment, but also to adopt such a system of values that will allow to choose what is good in the global scale (Domka, 2001).

The environmental education, which affects environmental awareness and change in human behaviour, plays a particular role in this process (Sikora, 2012; Pawul, Sobczyk, 2011; Zuzek, Wielewska, 2015). It constitutes an important domain of education, as its contents are the basis of the formation of man's approach towards the natural environment. In turn, the health and the quality of life of the inhabitants depend on the condition of this environment (Slota, 2012). The qualitative changes mainly include technological progress (Strzelecki, 2008).

The environmental (ecological) education constitutes *the entirety of activities and educational processes enabling people to*

orientate in the surrounding natural reality and affecting their attitude towards the surrounding environment (Cichy, 2003). The term *environmental education* began to function practically in 1969, when the famous U'Thant's report was published. It pointed out threats for human life and the danger of an environmental disaster caused by the excessive development of the civilisation.

The notion broader than the environmental education is the education for sustainable development. There is little or no coherent understanding of this notion in the subject literature. The education for sustainable development means the education that:

- enables the learner to acquire knowledge, skills and features which provide him with stable development;
- is geared towards criticism and problem solving, i.e. signifying a potential to deal with dilemmas and challenges of sustainable development;
- is equally accessible on all levels and in all social contexts (family, school, work, local community);
- builds a civil responsibility and promotes democracy by making the individual aware of their duties and rights;
- uses various methods of training whilst looking for creative ways of expressing new ideas;
- is based on the principle of learning throughout the entire lifetime;
- is concerned with local matters, rather than global ones (Godlewska, 2009).

The education for sustained development is found mainly in natural science. The main aims of the education for sustained development are:

- to give the educational activities for sustainable development a priority, so that the environmental awareness can develop, which protects the globe and civilisation from destruction;

- to develop learning about the limitation of consumption needs, which leads to an increase in respecting natural resources, rationalisation of production and using a system of values that is different than that of today;
- to learn how to introduce sustainable social and economic development in every country, so that we may all live worthily today, and the future generations tomorrow (Hlobil, 2010a).

Table 1

Issues of education for sustainable development

| Area of sustainable development | Issues |
|---------------------------------|---|
| Social | <ul style="list-style-type: none"> – human rights – peace and safety – gender equality – cultural variety and mutual understanding of cultures – health, incl. AIDS prevention – good governing |
| Environmental | <ul style="list-style-type: none"> – natural resources – climate change – development of agriculture – sustainable urbanisation – prevention of disasters and alleviation of their effects |
| Economic | <ul style="list-style-type: none"> – decreasing the scale of poverty – responsibility of businesses – market economy |

Source: J. Godlewska, Education for Sustainable Development, [in:] Sustainable Development – aspects of the development of local communities, Fundacja Forum Inicjatyw Rozwojowych, Białystok 2009:16-17

The education for sustainable development of rural areas leads to the popularisation of the pattern of ecological culture in the people of these areas. Its idea is to reach a balance between the protection of natural resources and the social and economic common good and the culture and tradition prevailing in the rural areas.

It ought to give a foundation for the formation and enhancement of the possibilities to solve important environmental problems.

The research included 77 girls (53.5 %) and 67 boys (46.5 %).

The content-related part of the survey began with the question about the identification by the

students of the notion of *sustainable development of rural areas* (Table 2).

The surveyed youths (63.2 %) perceive the notion of *sustainable development of rural areas* mainly as one including components contained in the triad of the model of sustainable development (social, environmental and economic). This choice can be described as the most accurate, as the integration and coherence of the economic, social and environmental spheres constitutes the essence of *sustainable development*, as it is the way to economic growth, an increase in the quality of living and an improvement in the condition of the environment and preserving it in this good condition for the future generations.

Table 2

Identification of the notion of sustainable development of rural areas by the surveyed students

| No | Notion | Number | % |
|----|---|--------|-------|
| 1. | Sustainable development is a concept of eco-development based on national economies managed according to environmental conditions, with an assumption that the environment issues are a priority. | 23 | 16.0 |
| 2. | Sustainable development is a process, which ideally allows to reduce contemporary differences in the social and economic situation of particular social categories, and to improve the standards of living of local communities that are in the worst situation. | 19 | 13.2 |
| 3. | Sustainable development is such social and economic development that – in order to balance chances for access to the environment for particular communities or their citizens – both for the present and future generations – integrates political, economic and social efforts, while preserving the environmental balance and the stability of the basic natural processes. | 91 | 63.2 |
| 4. | Difficult to say | 11 | 7.6 |
| 5. | Total | 144 | 100.0 |

Source: authors' study based on the research conducted

Some students (16 %) have chosen the definition which emphasizes the environmental dimension of sustainable development. A little over 13 % of the surveyed thought that the social-economic reference was the definition of *sustainable development of rural areas*.

The basis of the formation of social awareness supplemented by environmental awareness, as an integral part of sustainable development, is knowledge, its acquisition, processing and use in life (Hlobil, 2010). The surveyed were asked to assess the level of their own environmental awareness and knowledge of sustainable development (Table 3).

Table 3

Self-assessment of the level of their own environmental awareness in the students

| No | Level of awareness | Number | % |
|----|--------------------|--------|-------|
| 1. | High | 49 | 34.0 |
| 2. | Medium | 56 | 38.9 |
| 3. | Low | 32 | 22.2 |
| 4. | Difficult to say | 7 | 4.9 |
| 5. | Total | 144 | 100.0 |

Source: authors' study based on the research conducted

The students describe the level of their own environmental awareness mostly as medium (38.9 %) and high (34 %). However, it must be noted that although young people generally believe that they have a high environmental erudition, their activities do not go hand in hand with this knowledge. In everyday life, the youths are driven by fashion, comfort and consumerism rather than the environment protection oriented values. 22.2 % of the surveyed have estimated their level of environmental awareness as low; 4.9 % have not had any opinion in this matter.

It is clear from the above that the environmental awareness of the surveyed is still on an unsatisfactory level.

Further in the questionnaire, the surveyed were asked to determine in which sphere of sustainable development (social, economic, environmental) they have the highest level of knowledge (Table 4).

42.4 % have pointed out the environmental sphere as the one in which they have the highest level of knowledge. This might result from the fact that children are introduced to the rules of environmental education as early as kindergarten. This knowledge is later expanded in the following stages of their education.

Table 4

Spheres of sustainable development in which the surveyed have the highest level of knowledge

| No | Sphere of sustainable development | Number | % |
|----|-----------------------------------|--------|-------|
| 1. | Economic | 39 | 27.1 |
| 2. | Social | 36 | 25.0 |
| 3. | Environmental | 61 | 42.4 |
| 4. | Difficult to say | 8 | 5.5 |
| 5. | Total | 144 | 100.0 |

Source: authors' study based on the research conducted

A little more than a quarter of the surveyed (27.1 %) concluded that they have more to say in the economic sphere of sustainable development. Another 25 % claimed that they know quite a lot about the social dimension of sustainable development. Part of the surveyed (5.5 %) could not express their opinions in the matter.

According to the Core Curriculum and the guidelines contained in the National Qualification Framework, the education for sustainable development should be included in those curricula which are used in pre-school education, early school education, elementary/junior high schools, high schools and some university or college specialties. Thanks to the education on particular levels of schooling, the society has a possibility to acquire knowledge of sustainable development, also in rural areas.

Table 5

Self-assessment of the general level of the youths' knowledge of sustainable development in rural areas

| No | Level of knowledge | Number | % |
|----|--------------------|--------|-------|
| 1. | High | 26 | 18.0 |
| 2. | Medium | 37 | 25.7 |
| 3. | Low | 59 | 41.0 |
| 4. | Difficult to say | 22 | 15.3 |
| 5. | Total | 144 | 100.0 |

Source: authors' study based on the research conducted

The surveyed students variously estimated their level of knowledge of sustainable development in rural areas (Table 5). A large extent of knowledge in this aspect was declared by 18 % of the students. Another 25.7 % of the surveyed estimated it as medium. There are gaps in the education for sustainable development in rural areas, since as many as 41 % of the surveyed admitted that their knowledge is poor, and another 15 % did not have an opinion.

Another aspect of the research concerned the sources of knowledge of sustainable development of rural areas, where the youths can learn about it (Table 6).

Table 6

The youths' sources of knowledge of sustainable development of rural areas

| No | Sources of knowledge | Number | % |
|----|----------------------|--------|------|
| 1. | Internet | 92 | 63.9 |
| 2. | Television and radio | 46 | 31.9 |
| 3. | Press | 39 | 27.1 |
| 4. | School | 117 | 81.3 |
| 5. | Others | 15 | 10.4 |

Source: authors' study based on the research conducted

School (81.3 %) and the Internet (63.9 %) were indicated as the most important sources of knowledge of sustainable development of rural areas. The surveyed youths also gain their knowledge through television and radio (31.9 %) as well as the press (27.1 %).

Amongst other sources of knowledge of sustainable development of rural areas, the students mentioned environmental workshops, green schools, field trips with extensive natural

science curricula, occasional leaflets. In addition, local governments, institutions, non-government organisations and Ministry of Environment organize many events in the subject.

It must be noted that the environmental education should be interdisciplinary and intergenerational. It will serve the purposes for which it was predestined only if it covers all areas and levels of both formal and informal education (Hlobil, 2010).

Table 7

The presence of the education for sustainable development of rural areas in school curricula

| No | Presence | Number | % |
|----|------------------|--------|-------|
| 1. | Definitely YES | 24 | 16.7 |
| 2. | Rather YES | 59 | 41.0 |
| 3. | Difficult to say | 14 | 9.7 |
| 4. | Rather NO | 35 | 24.3 |
| 5. | Definitely NO | 12 | 8.3 |
| 6. | Total | 144 | 100.0 |

Source: authors' study based on the research conducted

It must be noted that the education for sustainable development found its place thanks to the Core Curriculum in formal education. Its presence (Table 7) was partially noticed by the surveyed youths (57.7 %). A little over a third were of a different opinion, and 9.7 % of the surveyed did not specify their opinions in the matter.

Many experts in the field of education for sustainable development have pointed out considerable shortage of teachers' training in this area. The surveyed youths were asked to estimate the level of teachers' qualifications in the researched aspect (Table 8).

It must be noted that the surveyed assessed the level of teachers' training in teaching about sustainable development of rural areas as high (30.6 %) or medium (46.5 %). Only 14.6 % perceive it as low and another 8.3 % did not have an opinion in the matter.

Table 8

Evaluation of the level of teachers' training in teaching

about sustainable development of rural areas, in the opinions of the surveyed

| No | Level of training | Number | % |
|----|-------------------|--------|-------|
| 1. | High | 44 | 30.6 |
| 2. | Medium | 67 | 46.5 |
| 3. | Low | 21 | 14.6 |
| 4. | Difficult to say | 12 | 8.3 |
| 5. | Total | 144 | 100.0 |

Source: authors' study based on the research conducted

The surveyed were also asked to evaluate the usefulness of knowledge of sustainable development of rural areas in practice (Table 9).

Table 9

Usefulness of knowledge of sustainable development of rural areas in practice, in the opinions of the surveyed students

| No | Usefulness | Number | % |
|----|------------------|--------|-------|
| 1. | High | 23 | 16.0 |
| 2. | Medium | 74 | 51.4 |
| 3. | Low | 28 | 19.4 |
| 4. | Difficult to say | 19 | 13.2 |
| 5. | Total | 144 | 100.0 |

Source: authors' study based on the research conducted

16 % of the surveyed saw the usefulness of knowledge of sustainable development of rural areas as high, and another 51.4 % as medium. 19.4 % of the surveyed saw it as low and another 13.2 % did not have an opinion in the matter.

To conclude, it is worth quoting Kofi Annan: "Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a reality for all the world's people." Only then will the chance for access to sustainable environment be preserved for the future generations.

Conclusions, proposals, recommendations

A new dimension of activity is required in the relationship between humanity (which can be described by the increasing industrial and technological potential), and the Earth's biosphere (which is the natural environment for

human life). This becomes possible to achieve through education.

The aim of the research conducted was to present the opinions of high school students about education for sustainable development of rural areas. It has shown that the young generation does understand the notion of *sustainable development of rural areas* as integration and coherence of the economic, social and environmental activities, leading to economic growth, an increase in the quality of living and an improvement in the condition of the environment and preserving it in this good condition for the future generations.

Those surveyed admitted that the highest level of knowledge that they have is in the environmental sphere of sustainable development. They estimated their own level of environmental awareness mostly as medium and high. However, it must be noted that, in spite of that, they are driven by fashion, comfort and consumerism in their daily life, rather than the values of environmental protection. Only a fifth of the surveyed described their level of knowledge of sustainable development of rural areas as high. The sources of this knowledge primarily include school, which passes the knowledge from the earliest years with the help of well-trained teachers, as well as the Internet, television, radio, press, environmental workshops, green schools, field trips with extensive natural science curricula. The surveyed maintain that the education for sustainable development of rural areas will be useful to them later in life.

To conclude, it must be emphasized that a reorientation of the system of values towards nature must become the chief task of education for sustainable development of rural areas. This means the creation of such a system that will be based upon dialogue with nature, the one that will identify and create new behaviours and activities and social norms in the social and natural environment.

Bibliography**Journal paper with author(s)**

1. Adamowicz, M. (2006). Konceptcje zintegrowanego, zrównowozonego i wielofunkcyjnego rolnictwa w polityce rozwoju wsi (The Concepts of Integrated, Sustainable and Multifunctional Agriculture in Rural Development Policies) [in:] M. Adamowicz (ed.) Zrównowazony i trwały rozwój wsi i rolnictwa (Balanced and Sustainable Development of Rural Areas and Agriculture). Warsaw: Prace Naukowe No. 38, SGGW, p. 8.
2. Cichy, D. (2003). Edukacja ekologiczna (Environmental Education) [in:] T. Pilch (ed.) Encyklopedia pedagogiczna XXI wieku (Pedagogical Encyclopedia of the 21st Century). Warsaw: Wydawnictwo Akademickie Zak, pp. 909-912.
3. Drelichowski, L. (2001). Spoleczenstwo informacyjne a ksztaltowanie rozwoju zrównowozonego (Information Society and Shaping Sustainable Development). „Promocje” No. 2, pp. 10-13.
4. Godlewska, J. (2009). Edukacja dla zrównowozonego rozwoju (Education for Sustainable Development), [in:] Zrównowazony rozwój – aspekty rozwoju spolecznosci lokalnych (Sustainable Development - Aspects of Local Community Development), Bialystok: Fundacja Forum Inicjatyw Rozwojowych, pp. 15-19.
5. Hlobil, A. (2010). Edukacja ekologiczna w praktyce szkolnej (Environmental Education in School Practice), Rocznik Ochrona Srodowiska (Annual Set: The Environment Protection). Tom 12, pp. 277-298.
6. Hlobil, A. (2010a). *Teoria i praktyka edukacji ekologicznej na rzecz zrównowozonego rozwoju* (Ecological Education for Sustainable Development – Theory and Practice), Problemy Ekorozwoju (Problems of Sustainable Development), No. 2, pp. 87-94.
7. Kowalczyk-Jusko, A. (2005). Szanse i zagrozenia zachowania roznorodnoscii biologicznej na obszarach wiejskich (Opportunities and Threats for Biodiversity Preserving on Rural Areas) [in:] A. Szponar, S. Horska-Schwarz (ed.) Struktura przestrzenno - funkcjonalna krajobrazu (The Spatial - Functional Structure of Landscape). Wroclaw: Uniwersytet Wroclawski, p. 272.
8. Pawul, M., Sobczyk, W. (2011). Edukacja ekologiczna w zakresie gospodarki odpadami jako narzedzie realizacji zrównowozonego rozwoju (Ecological Education in Waste Management as a Tool for The Implementation of Sustainable Development), Problems of Sustainable Development, Volume 6, No. 1, pp. 148-149.
9. Roman, M. (2014a). Cultural Tourism within the Concept of Sustainable Development (Turystyka kulturowa w koncepcji zrównowozonego rozwoju), „Ekonomia i Organizacja Przedsiębiorstwa”, No. 2, p. 66-67.
10. Roman, M. (2014b). Ekonomiczno-spoleczne uwarunkowania rozwoju agroturystyki w gminach wiejskich wojewodztwa podlaskiego (Economic and Social Conditions of the Development of Agritourism in Rural Communes of Podlaskie Voivodship), Wydawnictwo ZSCKR w Goladkowie, Goladkowo 2014, p. 37.
11. Runowski, H. (2004). Gospodarstwo ekologiczne w zrównowozonym rozwoju rolnictwa i obszarow wiejskich (Organic Farm in Sustainable Development of Agriculture and Rural Areas), Wies i Rolnictwo („Village and Agriculture”), No. 3, pp. 24-37.
12. Siemiński, J. L. (2008). Idea „rozwoju zrównowozonego i trwałego” obszarow wiejskich w Polsce na tle innych koncepcji. Ujecie planistyczne (Idea of Sustainable Rural Development in Poland Against the Background of other Conceptions. Planning Approach), Infrastruktura i Ekologia Terenow Wiejskich (Infrastructure and Ekology of Rural Areas), Polska Akademia Nauk, Volume 2, pp. 7-25.
13. Sikora, K. (2012). Wplyw edukacji ekologicznej i zdrowotnej na zmiane zachowan, postaw i jakosci zycia uczniow (Influence of Environmental and Health Education on Change of Behaviour, Attitudes and Quality of Life of Students). Rocznik Ochrona Srodowiska (Annual Set The Environment Protection), Volume 14, pp. 1009-1015.
14. Słota, M. (2012). Edukacja ekologiczna dzieci i mlodziemy w rejonach skazonych metalami ciezкими (Environmental Education of Children and Youth in Areas Contaminated with Heavy Metals) [in:] A. Guzy, D. Krzyzyk (ed.) Praca z uczniem o specjalnych potrzebach edukacyjnych (Working with a Student with Special Educational Needs), Kielce: Wydawnictwo Pedagogiczne ZNP, pp. 161-169.
15. Wielewska, I. (2006). Ekologizacja rolnictwa jako koncepcja rozwoju zrównowozonego (Ecological Changes in Agriculture as Concept of Balanced Development). Wroclaw: Zeszyty Naukowe Akademii Rolniczej we Wroclawiu, No. 540, pp. 557-564.
16. Zuzek, D. K. (2010). Theoretical Aspects of Sustainable Development of Farms [in:] W. Gotkiewicz (ed.) Local development – chosen factors of sustainable development of Poland, Szczecin: Zachodniopomorski Uniwersytet Technologiczny w Szczecinie (Szczecin: West Pomeranian University of Technology in Szczecin), pp. 35 – 48.
17. Zuzek, D.K., Wielewska, I. (2015). The Significance of Education in Promoting the Idea of Sustainable Development and Social Responsibility in Agriculture in the Pomeranian Voivodeship (Znaczenie edukacji w propagowaniu idei zrównowozonego rozwoju i spolecznej odpowiedzialnoscii rolnictwa w wojewodztwie pomorskim). Acta Sci. Pol., Oeconomia, 14 (4), 149–157.

Books

18. Domka, L. (2001). Dialog z przyroda w edukacji dla ekorozwoju (Dialogue with Nature in Education for Sustainable Development). Warsaw-Poznan: PWN, p. 87.
19. Prus, P. (2010). Funkcjonowanie indywidualnych gospodarstw rolniczych wedlug zasad zrównowozonego rozwoju (The Functioning of Individual Farms According to the Principles of Sustainable Development). Bydgoszcz: Wydawnictwo Uczelniane Uniwersytetu Technologiczno-Przyrodniczego w Bydgoszczy, p. 22.
20. Strzelecki, A. (2008). Gospodarka regionalna i lokalna (Regional and local economy). Warsaw: PWN, p. 13.

EVALUATION OF THE EFFECTIVENESS OF LOCAL ACTION GROUPS IN THE RURAL AREAS IN THE KUJAWSKO-POMORSKIE – RESEARCH RESULTS

Malgorzata Zajdel¹, Ph.D.; Malgorzata Michalcewicz-Kaniowska², Ph.D.

^{1, 2}UTP University of Science and Technology in Bydgoszcz, Poland, Faculty of Management

Abstract. Local Action Groups are important entities creating the development of rural areas. The aim of the research was to evaluate the effectiveness of Local Action Groups in the kujawsko-pomorskie province in terms of implementing the 2007-2013 Rural Areas Development Programme. Additionally, an attempt was made to identify the barriers and limitations identified in the execution of the programme LEADER 2007 - 2013 in terms of implementing a new instrument, 2014-2020 Rural Areas Development Programme "Community-led local development". The analysis involved data provided by the Marshal's Office, e.g. the number of projects executed divided into respective actions, the budget used, involvement of the entities and the number of new jobs. There was also performed an individual in-depth interview with the use of survey questionnaire with the director of the Department of Rural Areas Development, the most essential institution responsible for Rural Areas Development Programme project implementation in the kujawsko-pomorskie province. The research demonstrated that Local Action Groups showed a high level of activity in project execution, thus enhancing the local development, including, at the same time, the local communities. Considering the occurrence of problem areas identified in the previous period, attention was paid to the new period 2014-2020 to e.g. the adequacy of objectives of Local Development Strategies to identify the needs and the method of determining the measures of effectiveness for the projects executed. Finally, it will be important to focus on an increased involvement of the local community, leader training and teams implementing Local Development Strategies.

Key words: Local Action Groups, Rural Areas Development Programme, effectiveness of Local Action Groups.

JEL code: R11

Introduction

Essential modernization transformations in rural areas in reference to almost all domains of socio-economic life were largely possible by implementing the Rural Areas Development Programme in 2007-2013. The Axis 4 LEADER was essential; its objective was to activate the residents of rural areas, e.g. by building the social potential in the countryside (Ministry of Agriculture and Rural Development, 2016).

In rural areas, a number of tasks were commissioned to Local Action Groups; namely, the entities appointed responsible for the development of the regional and local policy of sustainable rural areas development. Local Action Groups in 2007-2013 were a partnership evenly represented by three sectors: social, public and economy (Futymski A., Kaminski R., 2008).

For a few years already, as part of the programme LEADER, it is possible to support the local community development through the activity of Local Action Groups, which, as partnerships, enhance the economy of the areas covered by the Local Development Strategy and attend to their cultural and social development

(Osiecka-Chojnacka J., Klos B., 2010). Local Action Groups were obliged to operate based on the Local Development Strategies. The Local Development Strategy is a document which provides the grounds for all the actions of the Local Action Group as part of Rural Areas Development Programme (Koscielecki P. et al.; 2010). In the applicable literature, it is stressed that the regional or local development strategy should show a comprehensive approach to the problems of the residents and the method of the fund allocation" (Kozuch A., 2008).

The strategy should include the analysis of needs and the potential of the separated area together with SWOT (strengths and weaknesses, threats and opportunities), as well as the strategy of innovativeness. The strategies should include the concept of the action showing in what way the plans will be converted to specific projects, the monitoring and management document as well as the financial plan. The operation of the Local Action Groups is a guarantee of local development focused on the needs of the residents using local resources, triggering social activity and involvement of the

¹ Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

local authorities and other local institutions (Sobczyk A., 2010).

Upon the completion of the Rural Areas Development Programme 2007-2013 execution, it is necessary to pay attention to the effectiveness of the actions taken so far by Local Action Groups and to the next prospect of their operation in 2014-2020.

The aim of the study was to evaluate the effectiveness of Local Action Groups in the kujawsko-pomorski region in terms of the 2007-2013 Rural Areas Development Programme implementation. Another objective was the analysis of the execution of measures of Axis 4 LEADER by the Local Action Groups in the kujawsko-pomorski region in 2007-2013. And yet another objective was an analysis of 2014-2020 Rural Development Programme documents in terms of evaluating the adequacy of the new criteria to be met by Local Action Groups.

The subject of the study are Local Action Groups. The study used the document analysis method considering secondary data derived from reports, statements as well as primary data based on the interview. The analysis included data made available by the Marshal's Office, e.g. a number of the projects executed divided into actions, the budget used, involvement of entities and the number of new jobs. Besides, there were identified problems which occur in the execution of the programme LEADER 2007 - 2013 in terms of the implementation of a new instrument, Rural Areas Development Programme, 2014-2020: "Community-led local development". To do so, individual in-depth interview was made with the use of survey questionnaire with the director of the Department of Rural Areas Development, which is the supreme institution responsible for Rural Areas Development Programme implementation in the kujawsko-pomorskie province.

Research results and discussion

The 2007-2013 Rural Areas Development Programme was implemented by the Local

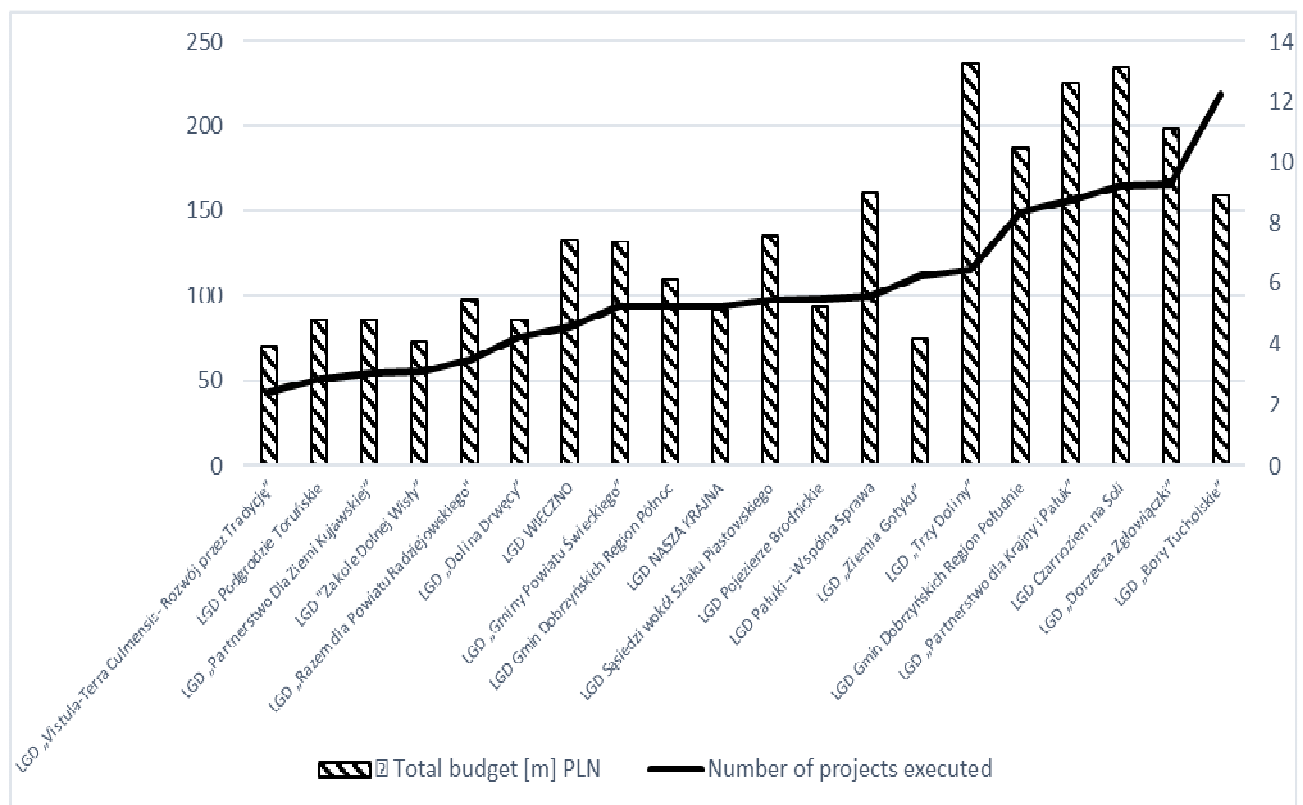
Authorities of the kujawsko-pomorskie province (Act 2007; Agreement, 2014). Measure 4 Axis LEADER performance points to a high activity of the Local Action Groups in the kujawsko-pomorski region. In 2007-2013, in the kujawsko-pomorskie province there operated 20 Local Action Groups, which disposed more than PLN 142 million (Europa inwestująca w obszary wiejskie, 2007). The study demonstrates that the Local Action Groups as part of a series of the actions taken, activated the rural areas' residents as well as made the local resources management more efficient. Interestingly, however, Local Action Groups operating in the kujawsko-pomorskie province in 2007 - 2013 varied a lot in terms of the institutional and personnel potential; however, with a possibility of a further development and extending the scope of measures (Zajdel M., Michalcewicz-Kaniowska M., 2013). As on 31.12.2015, as part of one of the action priorities "Local development strategies implementation", the Local Action Groups executed 624 projects covering the total budget of more than PLN 85.4 million. Additionally, as part of the so-called "Small projects", they completed 1458 projects at the amount of more than PLN 26.8 million, which is, in total, as many as 2082 projects with the total value of more than 112.1 million PLN. Besides, Local Action Groups filed 64 requests for co-financing as part of the measure "Operation of the local action group, acquiring skills and activation". The limit of funds for 2007-2013 was 28.8 million PLN; however, only 59 agreements were concluded, yet the total pool of money was disposed. As for measure "Cooperation project implementation", as on 31.12.2015, the projects at the total amount of more than 2.6 million PLN were executed. One can state that with the participation of the Local Action Groups in the kujawsko-pomorski region, 143 public halls, 604 playgrounds and 284 sports facilities were constructed or provided with additional sports infrastructure, 636 public halls were redecorated

¹ Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

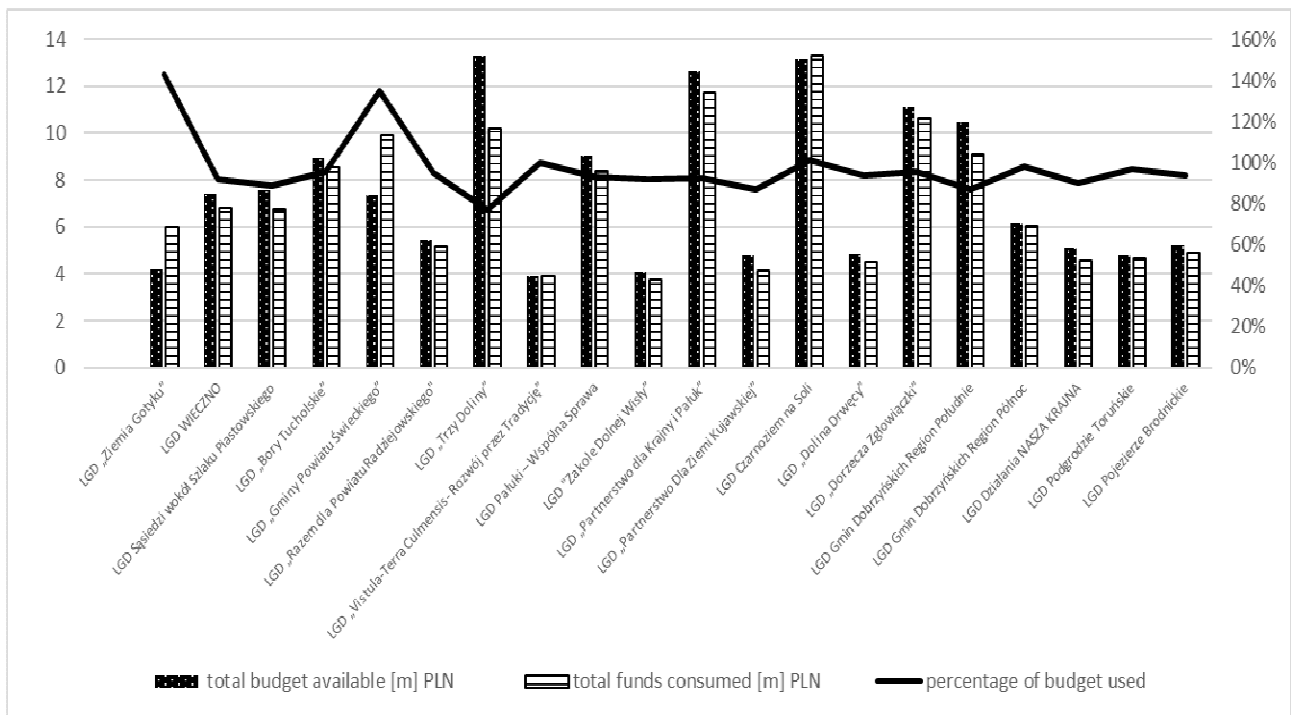
and another 630 public halls were equipped as well as 483 socialising events were held. The 2007-2013 perspective also considerably affected the development of the province by enhancing the attractiveness of the region and booming tourism. At that time, microenterprises were established to offer agritourism services, canoeing, bike rides etc., 260 leisure facilities were established or refurbished, namely beaches, barbecue facilities, jetties, marinas, kayak and pedal boats rentals, 43 monument structures and 83 historic churches were renovated. For the province promotion purposes, 320 guides, albums, atlases and other materials were published. The activity of Local Action Groups of the kujawsko-pomorskie province was expressed with a number of executed projects, in reference to the budget (Figure 1). However, to determine which of the Action Groups was most effective in terms of the number of the projects executed,

their number was referred to each allocated million PLN of the budget available. The results show that in the province, the groups executed on average 14 projects as part of the implementation of the Local Development Strategy for each 1 million PLN of the budget. The most effective here appeared to be the Local Action Group "Ziemia Gotyku" (27 projects) and "Bory Tucholskie" (25 projects); however, the Local Action Group "Trzy Doliny" scored lowest; it completed only 9 projects per 1 million PLN of budget, and it had the greatest budget of the entire province. Since such analysis did not fully reflect the effectiveness of the operation of the groups, it was decided that one must indicate the level of the total available budget to the values of the funds consumed, thus pointing to additional funds acquired by Local Action Groups (Figure 2).



Source: authors' study

Fig. 1. Number and budget of the projects completed



Source: authors' study

Fig. 2. Percentage of the budget use by Local Action Groups in the kujawsko-pomorskie province

In terms of the use of the budget available, three Local Action Groups which acquired the funds from additional sources were outstanding: Local Action Group "Ziemia Gotyku" (143 % of the budget use), "Gminy Powiatu Swieckiego" (135 %) and "Czarnoziem na Soli" (101 %). Also in that aspect, the Local Action Group which used only 77 % of the budget available, with the mean of 97 % scored lowest.

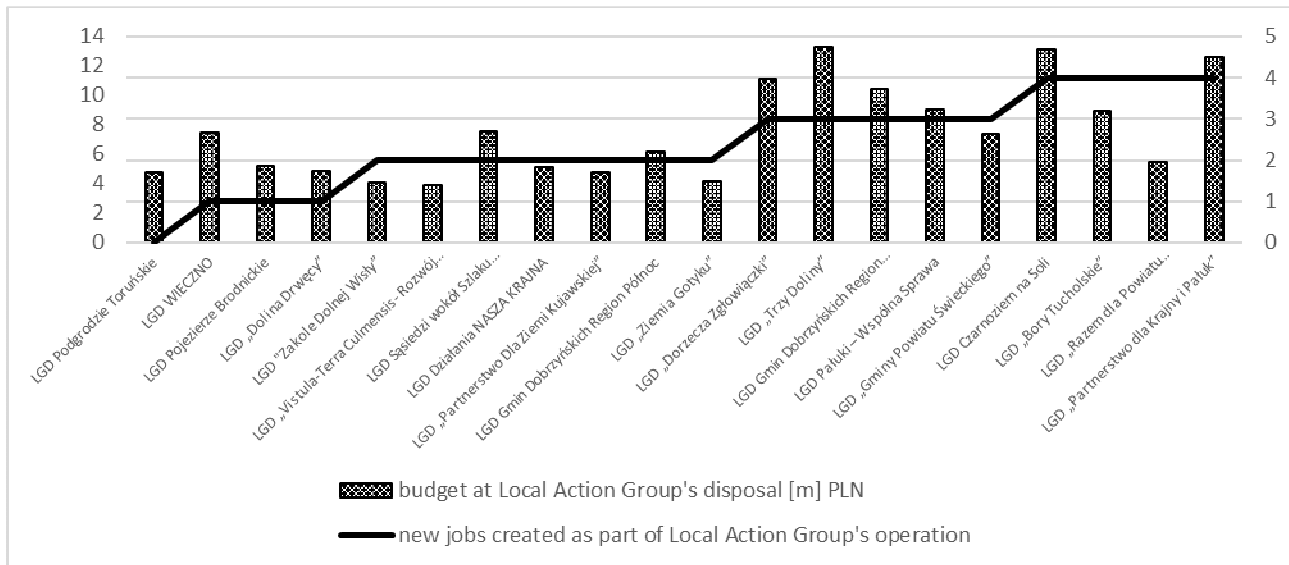
The situation of fund allocation into respective among Local Action Groups was similar. Most funds were allocated to the implementation of Local Development Strategies, ranging from 75 to 83 %, for the operation of Local Action Groups (16-22 %) and the so-called cooperation projects (1-3 %). The distribution is also atypical for Local Action Group "Trzy Doliny", which focused, more than other Local Action Groups, on the implementation of cooperation projects (3 %); it allocated quite a high share of funds to Local Action Group operation (22 %), whereas it focused a slightly lower percentage, than other Local Action Groups, on measure: Local Action Group implementation (75 %). Such Local Action Group as "Ziemia Gotyku", "Gminy Powiatu Swieckiego", or "Czarnoziem na Soli",

emphasised Local Action Group implementation more (from 83 % to 82 %) and the operation of Local Action Group (16 %-17 %), or cooperation projects implementation (1 %) less. The analysis points to a lack of the effect of the number of members of respective sectors for the number of the projects executed by that sector. One can, however, see a clear variation in the allocation as part of the actions related to "Local Development Strategy Implementation". Such tendency can result from various needs of local communities of each of the Local Action Group. However, one should note that as part of "Local Development Strategy Implementation", sub-measure "Village renewal and development" was mostly addressed to public entities, while sub-measure 2 "Small projects" was addressed to the social and public sectors, while sub-measure 3 "Diversification into non-agricultural activities" and the next one "Creation and development of microenterprises" was addressed to the economy sector. Thus, one can observe that some Local Action Groups focused on the public and social sector development more, while others focused more on the economy sector. The highest share of funds was allocated to public and social sector by the

¹ Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl
² Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

following Local Action Groups: "Czarnoziem na Soli" (98 %), "Sasiedzi wokół Szlaku Piastowskiego" (92 %), "Bory Tucholskie" (92 %) as well as "Zakole Dolnej Wisły" (91 %); hence a minimum (2 to 9 %) share of the budget was allocated to the economy sector by those Local Action Groups, whereas "Paluki - Wspólna Sprawa" (38 %), "Pogrodzie Toruńskie" (35 %),

"Gminy Powiatu Świeckiego" (33 %) as well as "Gminy Dobrzyńskie Region Południe" (31 %) focused on the economy sector. However, depending on the needs, some Local Action Groups invested more in the formation and development of microenterprises, and others - in diversification into non-agricultural activity.



Source: Authors' study

Fig. 3. Number of new jobs as part of the operation of Local Action Groups in comparison to the Local Action Group budget

Analysing the number of new jobs related to the operation of Local Action Groups, it is clear that the Local Action Groups which had a lower budget at their disposal hired fewer employees, which must have been due to the fact that "poorer" Local Action Groups could not afford a big number of employees. Local Action Groups with their budget below the average, in general, did not employ more than 2 employees (except for "Gminy Powiatu Świeckiego" (3 employees) and "Razem dla powiatu Radziejowskiego" (4 employees)). In total, as part of the measure "operation of Local Action Group" in the kujawsko-pomorskie province, 48 new jobs were created (Figure 3).

The analysis shows that the more funds allocated to sub-measures "Differentiation into non-agricultural activity", as well as "Creation and development of microenterprises", the more new jobs emerged as part of the execution of those projects (Table 1). Local Action Group

Paluki – Wspólna Sprawa can serve as an example; with the budget of 2.4 million PLN, it created 28 jobs and Local Action Group Sasiedzi wokół Szlaku Piastowskiego, with the budget of 0.4 million PLN – a single job only.

The 2014-2020 Rural Areas Development Programme analyses documents show that the new perspective requires the Local Action Groups to satisfy new criteria.

It is important now to identify problems the Local Action Groups were facing previously to be able to avoid similar problems in the future and to execute new projects more efficiently as well as to plan new investments and enterprises.

To have a complete knowledge in that field, an interview was made with the Director of the Department of Rural Areas Development who cooperates with all the groups in the kujawsko-pomorskie province.

¹ Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

The number of new jobs as part of Local Development Strategy implementation, in comparison to the total funds allocated to measure "Differentiation into non-agricultural activity" as well as "Creation and development of microenterprises"

| Local Action Group | Number of new jobs created as part of Local Development Strategy implementation | Amount of funds allocated |
|--|---|---------------------------|
| Local Action Group "Zakole Dolnej Wisly" | 4 | PLN 256 031.00 |
| Local Action Group "Sasiedzi wokół Szlaku Piastowskiego" | 1 | PLN 400 000.00 |
| Local Action Group "Działania NASZA KRAJNA" | 4 | PLN 481 525.00 |
| Local Action Group "Bory Tucholskie" | 4 | PLN 522 516.40 |
| Local Action Group "Razem dla Powiatu Radziejowskiego" | 3 | PLN 544 387.00 |
| Local Action Group "Pojezierze Brodnickie" | 8 | PLN 626 459.00 |
| Local Action Group "Partnerstwo Dla Ziemi Kujawskiej" | 8 | PLN 763 133.60 |
| Local Action Group "Partnerstwo dla Krajny i Paluk" | 14 | PLN 1 223 444.00 |
| Local Action Group "Paluki – Wspólna Sprawa" | 28 | PLN 2 452 456.50 |
| Local Action Group "Gminy Powiatu Swieckiego" | 12 | PLN 2 784 682.90 |
| MEAN | 8.6 | |

Source: Authors' study

When asked to indicate the problem areas in the period 2007-2013 while executing the Local Development Strategy it turned out that there was a number of complex problems from the execution stage. Other problems were present at the very beginning, others – during that stage, and still others – at the end of the period. At the very beginning, the problem was to determine who is to finance the strategy development and the initial operation of Local Action Groups if co-financing has not been launched yet and it was to be in a form of reimbursement. Finally, that role was taken over by the public entities. Another difficulty was the red tape and the requirements of the Ministry of Agriculture and Rural Areas Development. Here the Marshal's Office had a difficult role to play since many local ideas did not meet the criteria determined by the Ministry and it was the Marshal's Office which had to select those ideas and later to reject those which did not meet the criteria even though they often appeared very interesting. All that was obviously facing a lot of criticism and disappointment from Local Action Groups and local communities. The

problem was also the need to provide too many details to justify the costs. Yet another obstacle was the evaluation of the effects achieved, which was revealed only after the funds were paid for the first collection of the applications. It turned out that some Local Action Groups determined the measures inadequately. Local Action Groups claimed that they could not determine how big the part of the society is a given project has an impact on. At the very beginning, the measures were totally inadequately defined, and once the projects were completed, the measures were matched to the effects received, which makes the evaluation impossible. The most difficult assumptions in terms of execution were to demonstrate innovativeness. First there was missing a transparent description what innovativeness is and to what extent the project innovativeness should be. It was not clear whether it is about the innovativeness at global, national level or simply about such solutions which had not been available yet at local level. The difficulties also appeared in terms of the bottom-up approach. The projects were to result

¹ Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

from the needs of the local communities and so they had to meet the "top-down" requirements imposed by the European Commission. Some needs coincided with the requirements and were classified for the reimbursement and the needs which did not comply with the indicators defined by the European Commission had to be rejected.

The question "Which projects executed by the groups are considered the biggest success of Local Action Groups accomplished in the kujawsko-pomorskie province in 2007-2013?" did not receive a definite answer. It is very difficult to determine which project provided most benefits since each was giving some benefit to some group of beneficiaries. Those are numerous bike and walking trails, public halls, marinas, playgrounds, football grounds, fireman's halls, museums, tourist attractions and many cultural events.

It appeared that the reports developed on regular basis were the grounds for the evaluation of effectiveness of the operation of Local Action Groups. However, a reliable evaluation of the effects is very difficult to achieve, mostly due to incorrectly determined measures already at the beginning of the operation of Local Action Groups.

The current selection of Local Development Strategies executed with a new instrument "Local Development managed by the Community-led local development" as part of Rural Areas Development Programme 2014-2020 is determined by the highest scored criterion evaluating whether the objectives of the strategy are adequate to the needs defined by the local communities during consultations and the method of determining the indicators. Similarly, the principles considered when selecting the projects for execution are also essential. The involvement of the community in creating the Local Development Strategy is of much importance. Attention will also be paid to the area covered by the Local Development Strategy,

mostly its characteristics as well as the principles the Local Action Group is to be based on.

In the new period 2014-2020, the kujawsko-pomorski region focuses most on competitive economy, rural and city development, a strong metropolitan area of Bydgoszcz and Torun as well as modern society. The instrument of the Community-led local development covers practically all the four provincial strategy priorities. Community-led local development includes also such objectives as new jobs, activating the society, innovativeness, modern agrifood sector and maintaining the identity and cultural heritage. The priorities and objectives of the province are very closely connected to the priorities and objectives of Community-led local development. A joint effort to reach those objectives will surely bring the expected results.

In the previous programming period there were selected 20 Local Action Groups to execute Local Development Strategies. In the new EU budget period some requirements changed in terms of the area covered by Local Development Strategy. Thanks to Community-led local development, assistance was also given to the cities up to 20 thousand residents. In the kujawsko-pomorskie province, in the period 2014-2020, there will be operating 20 rural and rural-municipal Local Action Groups, 7 municipal Action Groups which will be operating in Bydgoszcz, Torun, Wloclawek, Inowroclaw, Grudziadz and they will be acquiring funds from the European Social Fund. There will be also created a fishermen's Local Action Group which will receive funds from the European Maritime and Fisheries Fund. Interestingly the kujawsko-pomorski region will be one of the two Polish provinces which, in the new period, will be receiving assistance from all the four funds.

One should note that the period 2007-2013 focused mostly on the development of entrepreneurship, increasing employment and sources of income and the current perspective focuses mostly on the economy sector. It is

¹ Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

essential now to increase employment and to co-finance small- and medium-sized enterprises. The previous perspective allocated a lot of funds to measure "Rural areas renewal and development", or "Small projects" which executed the measures of public sectors and focused on cultivating tradition.

Conclusions, proposals, recommendations

- 4) The research has demonstrated that in 2007-2013 Local Action Groups in the kujawsko-pomorskie province, as part of 4 Axis LEADER of the Rural Areas Development Programme, showed a high activity. The groups executed many projects and received considerable co-financing for local communities, using more than 143 million PLN. The effect of the projects executed by 20 Local Action Groups in the kujawsko-pomorskie province were numerous public halls, playgrounds, sports facilities, walking and bicycle trails, marinas, fireman's halls, museums, tourist attractions and the organization of cultural and socialising events as well as the emergence of new jobs.
- 5) The development strategy of the kujawsko-pomorskie province for the years 2014-2020 is cohesive with the objectives of the measures provided in the programme Leader for the period 2014-2020.

- 6) One can assume that the financial perspective for 2014-2020 can ensure the most effective operation of the Local Action Groups and eliminate the problem areas identified in 2007-2013 in the kujawsko-pomorskie province.
- 7) The grounds for the evaluation of the effectiveness of the operation of Local Action Groups in 2007 – 2014 were the regular reports with inadequately determined measures.
- 8) In the 2014-2020 perspective in the kujawsko-pomorskie province, there will be created 28 Local Action Groups the increased competences of which will ensure a possibility of deciding about the disposal and allocating co-financing. Attention is also paid to the involvement of the local community, training of leaders and teams implementing the Local Development Strategies.
- 9) Selecting the Local Development Strategy for the period 2014-2020, a special attention was paid to the adequacy of the objectives provided in the Local Development Strategy to identify needs. An important aspect is also adequately defining the measures of effectiveness of the projects executed. The criteria for selecting the projects for execution will also be made more precise.

Bibliography

Journal paper with author(s)

1. Osiecka, J. Chojnacka, J. Klos, B. (2010). Kapitał ludzki i kapitał społeczny na obszarach wiejskich (Human and social capital in rural areas), *Studia BAS*, no 4, p. 81.
2. Sobczyk, A. (2010). *Rozwoj lokalny - wybrane problemy finansowania*, (Local development – selected financing problems) Zeszyty Naukowe SGGW w Warszawie, *Ekonomika i Organizacja Gospodarki Żywnościowej*, pp. 126-127
3. Agreement no 4/BZD – UM02/2009 of 29 January 2009 with amended Annex no 1 of 2 November 2009, Annex no 2 of 1 December 2011 and Annex no 3 of 13 May 2014

Books

4. Futymski, A., Kaminski, R. (2008). Budowanie lokalnej strategii rozwoju w ramach osi 4. Leader Programu Rozwoju Obszarów Wiejskich na lata 2007-2013 (Building the local development strategy as part of Axis 4. Leader of the Rural Areas Development Program for 2007-2013), Warszawa, pp. 11-20
5. Kozuch, A. (2008). Współczesne tendencje w zarządzaniu finansami lokalnymi, (Contemporary tendencies in local finance management), [in]: A. Kozuch, W. Zaremba, *Zarządzanie finansami lokalnymi a rozwój obszarów wiejskich*, Krakow, p. 73.
6. Kosciielecki, P., Bloch, E., Spiewak, R., Zalewska, K. (2010). Podrecznik tworzenia i ewaluacji wskaźników w lokalnych strategiach rozwoju (Textbook of creating and evaluating the indicators in local development strategies) MRiRW,

¹ Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

7. Zajdel, M. Michalcewicz-Kaniowska, M. (2013). Uwarunkowania funkcjonowania Lokalnych Grup Działania w wojewodztwie kujawsko-pomorskim (Conditions of the operation of Local Action Groups in the kujawsko-pomorskie province), Bydgoszcz, p. 148

Internet sources

8. Ministerstwo Rolnictwa i Rozwoju Wsi; Działania Programu Rozwoju Obszarów Wiejskich na lata 2007-2013; Retrieved: ww.minrol.gov.pl/Wsparcie-rolnictwa/Program-Rozwoju-Obszarow-Wiejskich-2007-2013/Dzialania-PROW-2007-2013/OS-4-LEADER Access: 10.11.2016
9. Europa inwestująca w obszary wiejskie; Informacja o zadaniach realizowanych w zakresie Programu Rozwoju Obszarów Wiejskich, PROW 2007-2013, (2007) Urząd Marszałkowski Województwa Kujawsko-Pomorskiego; Retrieved: <http://2007-2013.mojregion.eu/program-rozwoju-obszarow-wiejskich/aktualnosci/czytaj/items/informacje-ogolne-o-programie-rozwoju-obszarow-wiejskich.html> Access: 20.10.2016
10. Act of 7 March 2007 about assistance to rural areas development with co-financing from the European Agricultural Fund for the Rural Areas Development (Dz. U. of 2013 item. 173); Retrieved: [file:///C:/Users/Akademia %20e-podpisu/Desktop/D20070427L.pdf](file:///C:/Users/Akademia%20e-podpisu/Desktop/D20070427L.pdf) Access: 15.11.2016

¹ Tel.: (0048) 52 340 81 76; e-mail: m.zajdel@utp.edu.pl

² Tel.: (0048) 52 340 81 76; e-mail: malgosia@utp.edu.pl

AGRICULTURAL PRODUCTION AND MARKET MODELLING APPROACHES

Sandija Zeverte-Rivza¹, Dr.oec.; Aleksejs Nipers², Dr.oec.; Irina Pilvere³, Dr.oec.

^{1,2,3} Faculty of Economics and Social Development, Latvia University of Agriculture

Abstract. Agriculture is a specific industry of the national economy that is subject to permanent economic, political, environmental and other changes. For this reason, credible and unbiased projections of its development are necessary, which take into account various conditions, including climate change. Agricultural modelling is widely used to assess and simulate the development of the agricultural industry; it has two key purposes: to contribute to the scientific understanding of a particular system and to analyse and project the effects of policies made and support instruments applied. The scientific literature provides a lot of information on modelling and simulation of dynamic systems. Therefore, the **overall aim** of the present research is to examine the key agricultural production and market forecasting models employed in the EU. To achieve the aim, the following **specific research tasks** are defined: 1) to analyse the theoretical aspects of simulation modelling; 2) to examine the key agricultural simulation models employed in the EU, including Latvia. The research has found that in the European Union (EU) diverse models by the approach and scope are employed for developing outlook of agriculture or its individual sectors. However, the most widely-used global and EU level models not always meet all the needs to accurately simulate the agricultural changes in the Member States level. For these reasons, in 2015 and 2016 two agriculture simulation models were developed in Latvia in order to project the potential development of agriculture and the key challenges related to climate change policies more accurately.

Key words: agriculture, simulation, models, modelling.

JEL code: Q10; C50

Introduction

Agriculture is a specific industry that is affected by various, usually changeable conditions determined by climate, seasonality, the market, production opportunities and historical development, the regulatory framework, political, environmental and social developments etc. Since 1962 in the EU this industry has been regulated by the Common Agricultural Policy (CAP), which has undergone many reforms that farmers have to reckon with. But over the next 20–25 years, global food demand is expected to increase by around 50%, largely due to demand in developing countries. The challenge is to increase production without damaging the natural resource base (William, Twomlow, 2007). For these reasons, it is important to 1) follow the changes taking place in the agricultural industry; 2) seek to project the development of the industry. Models are created in many countries, by means of which their governments follow the situation in agriculture.

Agricultural modelling has two key purposes: to contribute to the scientific understanding of a particular system and to analyse and forecast the effects of policies made and support instruments

applied (Boote, Jones, Pickering, 1996; Bouman, Van Keulen, Van Laar, 1996; Van Ittersum, Leffelaar et al., 2003; Ritchie, 1991; McCown, Hammer et al., 1996). According to the first purpose, agricultural modelling allows examining the performance of the agricultural industry's system components as a whole or individually and the system's interconnections. The second general purpose of creating models is to acquire information necessary for justifying agricultural policy decisions and simulating their potential effects. Models that show reactions of the agricultural industry's system to exogenous factors as well as planned agricultural and support policy changes have to be created to achieve this purpose. Users of such models wish to ascertain the potential reactions of the agricultural industry, which would help in making decisions or identifying how the system simulated by a model reacts to a particular decision made. By employing models, one can analyse both the alternative scenarios of planned decisions and the effects of the decisions on particular sectors – grain farming and livestock farming – as well as the structure of agricultural holdings and regional aspects (Thornton, Herrero, 2001; Van Ittersum,

³ Tel.: +371 29217851, E-mail address: Irina.Pilvere@llu.lv

Rabbinge, Van Latesteijn, 1998). An essential advantage of models is the acquisition of credible information on a system's behaviour affected by decisions made, which could be used by agricultural policy makers.

Therefore, the overall **aim of the present research** is to examine the key agricultural forecasting models employed in the EU. To achieve the aim, the following specific **research tasks are defined**: 1) to analyse the theoretical aspects of simulation modelling; 2) to examine the key agricultural simulation models employed in the EU, including Latvia.

Methodology and data. Analysis, synthesis, the logical and constructive methods, induction and deduction analysis methods were employed to execute the research tasks. Scientific literature review was used.

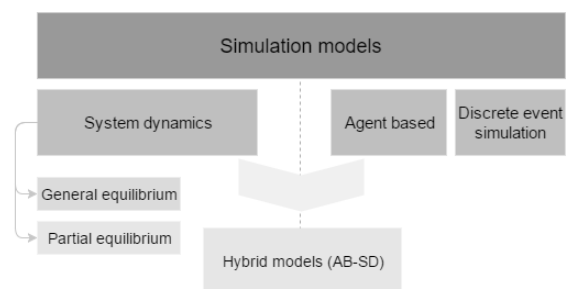
Research results and discussion

1. Theoretical aspects of agricultural modelling

An approach that may be classified as the simulation modelling of dynamic systems or system dynamics (SD) modelling is widely employed in agricultural modelling. System dynamics is an approach to examining the dynamics of complex systems, by means of which complicated problems could be solved (Dzene, 2011). System dynamics theory is based on examining associations between a system's behaviour and the underlying structure of the system (Martin, 1997). Analysing the structure of a system contributes to a deeper understanding of the causes of the system's behaviour, which allows effectively solving problems related to the behaviour of the system observed (Zeverte-Rivza, 2014). In dynamic models, changes in the state of an object over time are characterised by unknown variables and causal associations. For this reason, the results obtained by employing such dynamic models allow analysing potential changes in the functioning of the object and identifying the most typical trends in and causal relationships of it (Frolova, 2005). Unlike the

statistical approach, such models involve functions that allow explaining the changes taking place in a system if the system reacts to exogenous factors (e.g. price changes, support instruments).

It is also possible to identify how the changes influence other system components (Wallach, Makowski et al., 2014). This approach is used in all types of models, including those for grain farming, livestock farming and farm systems. In the world, system dynamics is also used for analysis of renewable energy production, estimation of CO₂ and other GHG emissions from various industries and research on energy resources at national level and other complex processes. Although initial research investigations were started as early as the 1960s, this kind of modelling has been widely used since the 1990s (Gilbert, Troitzsch, 2006). The key problem is associated with data acquisition – to replace a research object with an artificially created system, in an ideal case accurate original system performance data are necessary (Pate-Cornell, 2002) –, which considerably hinders the modelling of economic and social systems, as the systems are quite uncertain and large in scope as well as involve the influencing factors that are difficult to define. A relatively new trend in the creation of models is agent-based (AB) modelling (Billari, Fent, et al., 2006; Berger, Troost, 2014), which is widely used to simulate interactive human behaviours and other individual element based processes (Antle, Basso et al., 2015). Discrete-event models, however, are employed to simulate individual events (Figure 1).



Source: authors' construction based on Borshchev, Filippov, 2004

Fig. 1. Classification of simulation models

By employing the system dynamics approach, a model is developed as a reflection of a system; therefore, the model is created from top to bottom, showing the system's causal relationships and overall behaviour by means of cause-and-effect loops. Although system dynamics models may have micro-level elements such as, for example, agricultural holdings, yet no specific behaviour is set for individual elements within the model and the performance of the whole system is analysed instead. In contrast, agent-based models employ the bottom-up modelling approach. It means that developing such a model is begun with defining parameters and behaviours for individuals or agents, setting a number of characteristic parameters for each agent. Although causal associations between agent groups could be identified in agent-based models, however, unlike the system dynamics approach, such models are not usually employed for simulating macro-level systems (Table 1).

Such models are usually created from individual modules that involve data acquired from agent-based simulations and exogenous data on the particular system.

Classifying models according to their scale, one can find that the broadest systems examined are simulated by so-called general equilibrium models. They are mainly global-scale models that simulate macroeconomic processes. The scale of partial equilibrium models is different; there are some global-scale partial equilibrium models, yet most often they represent the models for countries or country groups (e.g. the EU, the USA) that focus on analysis of a particular industry or sector (agriculture, energy etc.). AB-SD models deal with the behaviour of individual agents, their links and their influence on a sector selected.

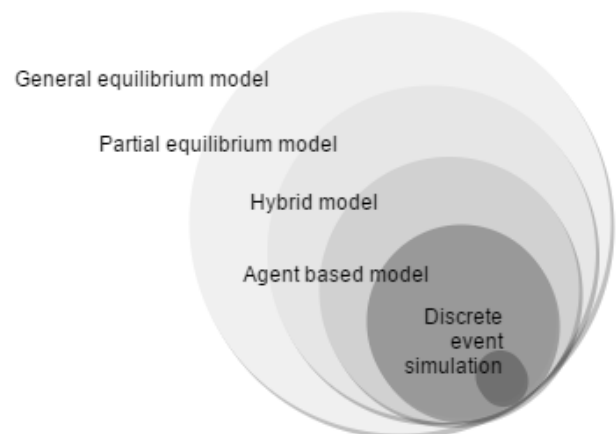
Table 1

Comparison of system dynamics and agent-based models

| Parameter | System dynamics models | Agent-based models |
|-------------------------|----------------------------|-------------------------------------|
| Modelling approach | Top-down | Bottom-up |
| Key structural elements | Casual loops | Individualized input data on agents |
| Units of analysis | System's structure | Agent behaviour rules |
| Modelling scale | System's overall behaviour | Individual agent behaviour |

Source: authors' construction based on Martin, Schuler, 2015; Borshchev, Filippov, 2004

Hybrid models or agent-based system dynamics (AB-SD) models are developed by combining the advantages inherent in system dynamics models and agent-based models. They combine the features characteristic of both kinds of models – individualised agent behaviours are simulated by associating the models' systems with particular causal associations and systemic changes with changes in the agent behaviours.



Source: authors' construction

Fig. 2. Models divided according to their scale of application

Agent-based models deal with the behaviour of agents on a small scale, while discrete-event models simulate individual events and therefore are not usually employed in tackling sectorial problems and simulating economic systems.

2. Models employed for projecting the agricultural sector in the EU

General equilibrium models

GEM-E3 is a general equilibrium model that simultaneously simulates the whole world's economy and the economies of the world's most important regions and 28 EU Member States. All these regions are interlinked through endogenous bilateral trade flows and environmental flows.

The purpose of GEM-E3 is to cover the interactions between the economy, the energy system and the environment. It is a comprehensive model of the economy, the productive sectors, consumption, price formation of commodities, labour and capital, investment and dynamic growth. The model is dynamic and recursive over time. GEM-E3 is employed for acquiring the European Commission's reference scenario macro-assumptions. The model uses the GTAP and EUROSTAT databases.

MAGNET is a global general equilibrium model, and its main purpose is to provide a globally applied general equilibrium modelling framework, which may be tailored to specific research questions, including focusing on individual regions or products. MAGNET was designed based on the LEITAP model that was widely used for analysis of policies. MAGNET was developed because a more flexible and easily adjustable simulation system was necessary. The model employs the GTAP database.

Partial equilibrium models

The **CAPRI** model is currently employed for projecting the agricultural industry at the EU level. The full name of CAPRI is Common Agricultural Policy Regionalised Impact analysis. The name indicates the key purpose of the model – to evaluate the effects of CAP instruments not only at EU and Member State level but also at international level (Britz, Witzke, 2014). CAPRI is a static partial equilibrium model intended for the agricultural industry. It was designed to assess the impacts of policies and markets from global to regional and farm level. CAPRI is based on a link between a Europe-focused supply module and a global market module (Frank, Witzke et al., 2014). The CAPRI simulation system consists of a database, a methodology and a computer application. CAPRI uses data from the EUROSTAT, FAOSTAT, OECD and FADN databases. Its specific modules ensure that the data are mutually compatible. The data cover about 50 agricultural primary and processed

products for the EU, from farm type to global scale coefficients (Britz, Witzke, 2014).

AGLINK is a part of the AGLINK-COSIMO model that was designed by the OECD Secretariat in cooperation with OECD member countries and selected non-OECD countries, thereby covering part of developing states. Since 1992 AGLINK has been used for making projections published in the OECD Agricultural Outlook. AGLINK is employed to provide analytical information for making annual medium- and long-term projections. The model's ability to perform alternative scenarios has made it one of the key OECD tools for forward-looking policy analysis. In 2004, it was decided to extend the AGLINK model to a larger number of developing countries and regions and to jointly undertake the annual medium-term outlook exercise in cooperation with the UN Food and Agriculture Organisation (FAO). The new component added to the model was named COSIMO (COMmodity SIMulation MOdel). The general programming structure of COSIMO was taken over from AGLINK, while the behavioural parameters for the new country modules were taken from its predecessor, the World Food Model, employed by the FAO (Adenauer, 2008). The AGLINK model is widely employed for producing agricultural outlook in the EU.

AGMEMOD is an econometric, dynamic, multi-product partial equilibrium model that allows to make projections and simulations in order to evaluate measures, programmes and policies in agriculture at EU level as well as at Member State level (AGMEMOD, 2013). AGMEMOD covers all the EU Member States and some non-EU countries, e.g. Turkey, Russia and Ukraine. The Latvian State Institute of Agrarian Economics participated in developing AGMEMOD (AGMEMOD consortium, 2012), yet currently scientists from Latvia University of Agriculture are engaged in updating national data and renewing equations. AGMEMOD is employed for simulating the EU's agricultural industry.

AGMEMOD was developed by using the FAPRI modelling system. FAPRI is widely used in the USA – annual baseline projections for the U.S. agricultural sector and international commodity markets are prepared by means of it, evaluating and comparing scenarios involving macroeconomic, policy, weather and technology variables (Fapri Models, s.a.).

ESIM is a partial equilibrium multi-country model of agricultural production, consumption of agricultural products (and some first-stage processing activities). It can be used in a comparative static as well as a recursive dynamic version. ESIM is programmed in the General Algebraic Modelling System (GAMS). Only the agricultural sector is simulated by means of ESIM, therefore such macroeconomic variables as income or exchange rates are exogenous. As a world model it covers all countries, although in greatly varying degrees of disaggregation. In its current version ESIM includes 25 EU Member States (including the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Malta and Cyprus), with Belgium and Luxembourg being summarised as one region, and also other states and regions- Turkey, USA Western-Balkans. All other countries are aggregated as the so-called rest of the world (Grethe H. (ed), Atavia et al., 2012). ESIM is employed to project the development of the EU agricultural industry.

GLOBIOM-EU is a global recursive, dynamic, partial bottom-up model, which integrates the agriculture, bioenergy and forestry sectors. The objective function calculates a global market equilibrium for agriculture and forestry by taking into account various land uses and product processing activities. The model forecasts the demand for and international trade in agricultural and forestry products for 53 world regions (28 EU Member States and 25 regions outside the EU) (Globiom model, 2012).

Agent-based models

AgriPoliS is an agent-based model of regional agricultural structures. The purpose of the model is to understand how farm structures change within a region in response to different policies, including evaluation of the effects of the CAP on agricultural landscapes, biodiversity and ecosystem services. Results generated by AgriPoliS at both the farm and regional levels include: areas and yields of crops, types and numbers of livestock, developments in farm specialisation and size, profits from agriculture and off-farm income, labour hours, input usage, land rental prices, investments and a full range of accounting data. Environmental results include changes in: land-use, landscape mosaic, number of species (biodiversity), nutrient balances, pesticide usage, soil carbon storage and soil fertility.

Researchers from the Netherlands, however, have developed an agent-based **model for the dairy sector of the Netherlands**, which simulates every dairy farm as an agent and analyses the effect of abolition of milk quotas on the structural change of the farms. The model simulates two government policy scenarios: 1) abolition of milk quotas; 2) use of agricultural land for sustainable dairy farming. Such input data as the location, the utilised agricultural area, fixed and variable costs and other data are entered into the model for every farm.

At present, the EC employs the CAPRI, AGLINK-COSIMO, AGMEMOD and ESIM models for preparing the outlook for the agricultural industry. Other specific models are also employed for preparing medium-term forecasts, such as, for example, "EU Agricultural Outlook Prospects for EU Agricultural Markets and Income, 2015-2025". The Directorate-General for Agriculture and Rural Development employs the **FeedMod** model for simulating feed consumption in the EU. The Directorate-General for Climate Action uses the **POLES** model for simulating fuel consumption. The **IHS Global Link Model**,

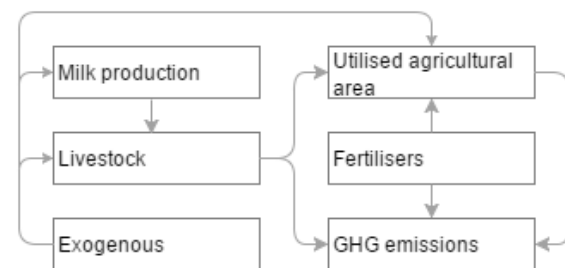
which is a global macroeconomic model, is also used for analysis of policies; it links 68 individual country models with each other and accounts for 95% of global GDP (EU Agricultural Outlook, 2015).

3. Models employed for analysis of Latvia's agricultural sector

Since the year 2000 the AGMEMOD model has been widely employed in the EU owing to funding available under the European Commission 6th Framework and contributions from the partners institutes throughout the EU. However, this 6th Framework project for the Institute for Prospective and Technological Studies (IPTS), part of the European Commission's Joint Research Centre project, was set to run until 2008 and was completed by 2007 (AGMEMOD, 2013). Some IPTS research studies provide information about Latvia after 2008, yet it is fragmented and covers selected agricultural sectors (Chantreuil, Salputra, Erjavec, 2013; Salputra, Chantreuil et al., 2011; Erjavec, Chantreuil et al., 2011).

Therefore, the necessity for creating appropriate models commissioned by the Ministry of Agriculture of the Republic of Latvia to project the agricultural sector increased in Latvia in recent years. In 2015, Latvia University of Agriculture designed a model for projecting agricultural indicators and GHG emissions from the agricultural sector for the years 2020, 2030 and 2050, which employed several approaches depending on a particular agricultural sector or a projected indicator: a) a semilogarithmic or linear trend model – to forecast crop yields and other selected indicators; b) a linear multifactor regression equation – to determine the numbers of cattle, sheep, goats, pigs, poultry and rabbits and the areas cropped with barley, oats and rye as well as permanent grasses; c) an S-shape curve (sigmoid) to determine the number of horses and the areas under wheat, rapeseed, maize and potato (LR Zemkopibas ministrija..., 2015).

In 2016, Latvia University of Agriculture developed the Latvian Agricultural Sector Analysis Model (LASAM), which was designed as a partial equilibrium econometric model that evaluated various development scenarios. The system dynamics modelling approach is employed by the model to simulate the agricultural industry of Latvia, which allows identifying the effect of change in agricultural policies on selected agricultural sectors. The model makes projections for such sectors as livestock farming (dairy cattle, beef cattle, sheep, goats, pigs, poultry and horses) and crop farming (grain, rapeseed, legumes, maize, vegetables and permanent grasses) as well as forecasts of UAA use and emissions from agriculture (Figure 3).



Source: Latvia University of Agriculture..., 2016

Fig. 3. Key structural elements of the LASAM model

Data for the model are acquired from the FADN and CSB databases, while projections of change in some indicators are employed by the model as exogenous variables obtained from the outlooks made by the EC and the FAO. To simulate macroeconomic indicators, the model employs macroeconomic projections for Latvia that are produced by the Ministry of Economics. Prices on goods are exogenous for the model. In the basic scenario, prices on agricultural goods are based on the European Commission's DG-AGRI projections for the period until 2025 and further projections are made by extrapolating from data-based trends. Support policy data are based on the distribution of financial aid until 2020, which is made by the Ministry of Agriculture. The amount of financial aid beyond

2020 is assumed to be at the 2020 level (Latvijas Lauksaimniecības universitāte..., 2016). This model is employed to project development trends in the agriculture sector of Latvia for 2030 and 2050; it takes into account national and EU agricultural support policies as well as changes in prices on resources and products in the EU.

Conclusions, proposals, recommendations

- 1) The scientific literature refers to the simulation modelling of systems as a widely employed method. The most popular models for simulation are as follows: a) systems dynamic; b) agent-based; c) hybrid; d) discrete event models.
- 2) The scope of simulation by models differs– the smallest scope is specific to discrete-event models, while general equilibrium models are used to make global scale simulations.
- 3) Various models are employed for simulating the agricultural sector in the EU, which focus on simulating different aspects of agriculture.

Bibliography

1. Adenauer, M. (2008). CAPRI versus AGLINK-COSIMO Two Partial Equilibrium Models – Two Baseline Approaches. *12th Congress of the European Association of Agricultural Economists – EAAE 2008*, p. 4.
2. AGMEMOD (2013). Retrieved: <http://www.agmemod.eu/> Access: 16.12.2016.
3. AGMEMOD consortium (2012). Future Plans of AGMEMOD, consortium meeting, Brussels.
4. Antle, J. M., Basso, B. O., Conant, R. T., Godfray, C., Jones, J. W., Herrero, M., Howitt, R. E., Keating, B. A., Munoz-Carpena, R., Rosenzweig, C., Tittone, P., Wheeler, T. R. (2015). Model Design, Improvement and Implementation. In: *Towards a New Generation of Agricultural System Models, Data, and Knowledge Products. Model Design, Improvement and Implementation*, 31 January 2015, pp. 63-89.
5. Berger, T., Troost, C. (2014). Agent-based Modelling of Climate Adaptation and Mitigation Options in Agriculture. *Journal of Agricultural Economics*, Vol. 65(2), pp. 323-348.
6. Billari, F. C., Fent, T., Prskawetz, A., Scheffran, J. (2006). Agent-Based Computational Modelling: An Introduction. *Agent-Based Computational Modelling. Physica-Verlag HD*, pp. 1-16.
7. Boote, K. J., Jones, J. W., Pickering, N. B. (1996). Potential Uses and Limitations of Crop Models. *Agronomy Journal*, Vol. 88, pp. 704-716.
8. Borshchev, A., Filippov, A. (2004). From System Dynamics and Discrete Event to Practical Agent Based Modelling: Reasons, Techniques, Tools. *The 22nd International Conference of the System Dynamics Society*, 25–29 July 2004, Oxford, England, p. 23.
9. Bouman, B. A. M., Van Keulen, H., Van Laar, H. H., Rabbinge, R. (1996). The 'School of de Wit' Crop Growth Simulation Models: A Pedigree and Historical Overview. *Agricultural Systems*, Vol. 52 (2-3), pp. 171-198.
10. Britz, W., Witzke, H. P. (2012). CAPRI Model Documentation 2012. In: *CAPRI Model Documentation 2012*, Bonn, University of Bonn.
11. Chantreuil, F., Salputra, G., Erjavec, E. (2013). Market Analysis of Direct Payment Options for New EU Member States Using the AGMEMOD Partial Equilibrium Modelling Tool. *Outlook on AGRICULTURE*, Vol. 42, No 1, pp. 33–40 doi: 10.5367/oa.2013.0111
12. Dzene, I. (2011). *Latvijas reģionu enerģosistēmu ilgtspējīgas attīstības modeļesana un optimizācija (Simulation and Optimisation of the Sustainable Development of Energy Systems in the Regions of Latvia)*. Doctoral thesis. Rīga, RTU, p. 130.
13. Erjavec, E., Chantreuil, F., Hanrahan, K., Donnellan, T., Salputra, G., Kožar, M., Van Leeuwen, M. (2011). Policy Assessment of an EU Wide Flat Area CAP Payments System. *Economic Modelling*. Vol. 28, Issue 4, July 2011, pp. 1550–1558.

- There are eight key models of different complexity, yet some Member States have created other models appropriate for a particular agricultural sector, region or issue.
- 4) The AGMEMOD model that is popular in the EU is employed for analysis of the agricultural sector of Latvia. However, two new models appropriate for the conditions in Latvia have been elaborated since 2015; each of the models have a different focus, yet both models produce projections and development scenarios, which allows applying policy instruments in a more accurate way in future, depending on the potential trend in the particular sector.

Acknowledgements

The research was promoted with the support of the project of the Ministry of Agriculture of the Republic of Latvia "Forecasting of Agricultural Development and the Designing of Scenarios for Policies until 2050", agreement No. 16-100-INV16-5-000001.

14. EU Agricultural Outlook. Prospects for EU Agricultural Markets and Income 2015-2025 (2015). Report: European Commission, p. 81.
15. European Commission (2015). Medium-term Prospects for EU Agricultural Markets and Income 2015-2025, Retrieved: http://ec.europa.eu/agriculture/markets-and-prices/medium-term-outlook/2015/fullrep_en.pdf Access: 20.12.2016.
16. FAPRI Models: Retrieved: <http://www.fapri.iastate.edu/models> Access: 22.12.2016
17. Frank, S., Witzke, P., Zimmermann, A., Havlik, P., Ciaian, P. (2014). Climate Change Impacts on European Agriculture: A Multi Model Perspective. In: *EAAE 2014 Congress Proceedings: Agri-Food and Rural Innovations for Healthier Societies*, 26-29 August 2014 Ljubljana, Slovenia, p. 15.
18. Frolova, L. (2005). Matematiska modelesana ekonomika un menedzmenta (Mathematical Modelling for Economics and Management). Riga, Izglitibas soli Ltd, p. 217.
19. Gilbert, N., Troitzsch, K.G. (2006). Simulation for the Social Scientists. 2nd edition. UK: *Open University Press*. p. 298.
20. GLOBIOM model (2012). *European Commission, Climate Analysis Models*. Retrieved: https://ec.europa.eu/clima/sites/clima/files/strategies/analysis/models/docs/globiom_en.pdf Access: 02.01.2017.
21. Grethe, H. (ed), Atavia, M., Banse, M., Boysen, O., Deppermann, A., Nolte, S. (2012). *European Simulation Model (ESIM): Documentation (Model Code, Parameterization, Database)*, p. 101.
22. Latvijas Lauksaimniecības universitāte (Latvia University of Agriculture) (2016). Zinatniska petījuma Lauksaimniecības attīstības prognozesana un politikas scenariju izstrāde līdz 2050. gadam projekta atskaite (Report on the project Forecasting of Agricultural Development and the Designing of Scenarios for Policies until 2050). Jelgava, December 2016, p. 98.
23. LR Zemkopības ministrija un Latvijas Lauksaimniecības universitāte (Ministry of Agriculture of the Republic of Latvia and Latvia University of Agriculture) (2015). Lauksaimniecības radītāju un SEG emisiju no lauksaimniecības sektora prognoze 2020., 2030. un 2050. gadiem ar papildu pasākumiem emisiju samazināšanai atskaite (Report on the Forecast of Agricultural Indicators and GHG Emissions from the Agricultural Sector for 2020, 2030 and 2050 with Additional Emission Reduction Measures). Riga, 1 December 2015, p. 78.
24. Martin, L. A. (1997). *The First Step. System Dynamics in Education Project*. Massachusetts Institute of Technology, p. 59.
25. Martin. R., Schuler. M. (2015). Combining System Dynamics and Agent-Based modelling to Analyse Social-ecological Interactions—an Example from Modelling Restoration of a Shallow Lake. In: *Frontiers in Environmental Science*, Vol. 3. Art. 66. doi: 10.3389/fenvs.2015.00066.
26. McCown, R.L., Hammer, G.L., Hargreaves, J.N.G., Holzworth, D.P., Freebairn, D.M. (1996). APSIM: a Novel Software System for Model Development, Model Testing and Simulation in Agricultural Systems Research. *Agricultural Systems*, Vol. 50, pp. 255-271.
27. Pate-Cornell, M.E. (2002). The Engineering Risk Analysis Method and Some Applications. *Advances: Engineering Risk Analysis*, Vol. 4, No. 16, pp. 1-40.
28. Ritchie, J.T. (1991). Specifications of the Ideal Model for Predicting Crop Yields. In: R.C. Muchow and J.A. Bellamy (eds.) *Climatic Risk in Crop Production: Models and Management for the Semi-arid Tropics and Subtropics*. Proc. Intl. Symposium, St. Lucia, Brisbane, Queensland, Australia, 2-6 July 1990. C.A.B. International, Wallingford, U.K. pp. 97-122.
29. Salputra, G., Chantreuil, F., Hanrahan, K., Donnellan, T., Van Leeuwen, M. (2011). Policy Harmonized Approach for the EU Agricultural Sector Modelling. *Agricultural and Food Science*, Vol. 20, pp. 119-130.
30. Thornton, P.K., Herrero, M. (2001). Integrated Crop-livestock Simulation Models for Scenario Analysis and Impact Assessment. *Agricultural Systems*, Vol. 70, pp. 581-602.
31. Van Ittersum, M. K., Leffelaar, P. A., Van Keulen, H., Kropff, M. J., Bastiaans, L., Goudriaan, J. (2003). On Approaches and Applications of the Wageningen Crop Models. *European Journal of Agronomy*, Vol. 18, pp. 201-234.
32. Van Ittersum, M.K., Rabbinge, R., Van Latesteijn, H.C. (1998). Exploratory Land Use Studies and their Role in Strategic Policy Making. *Agricultural Systems*, Vol. 58, pp. 309-330.
33. Wallach, D., Makowski, D., Jones, J. W., Brun, F. (2014). *Working with Dynamic Crop Models: Methods, Tools and Examples for Agriculture and Environment* (Second Edition). Academic Press, Waltham, MA, p. 504.
34. William. D. D., Twomlow. S.J. (2007). Managing Agricultural Intensification: The Role of International Research. *Crop Protection*, Vol. 26. pp. 399-407.
35. Zeverte-Rivza, S. (2014). *Risku izvertejums atjaunojamās enerģijas ražošanā lauku saimniecībās Latvijā (Risk Assessment for Renewable Energy Production on Farms in Latvia)*. Doctoral thesis, p. 193.

MARKETING AND SUSTAINABLE CONSUMPTION

ANALYSIS OF LATVIA INHABITANTS' CONFIDENCE TOWARDS GMO

Inese Aleksejeva¹, Dr.oec; **Biruta Sloka**², Dr.oec., professor⁺; **Inara Kantane**³, Dr.sc. admin., researcher, associate professor and **Anastasija Vilcina**⁴, Dr.oec., professor

^{1,2} University of Latvia; ³University of Latvia; The University of Economics and Culture; ⁴Latvia University of Agriculture

Abstract. The aim of the paper is to study Latvian inhabitants' confidence in politicians and decision makers, competent supervisory and control authorities, mass media, enterprises responsible for GMO elaboration, scientists responsible for the risk assessment of GMO, organisations that protect consumer rights, food producers and traders and environmental activists and environmental protection organisations towards GMO. The study is based on the results of Latvian inhabitants' survey performed in 2014 and 2015.

Methods applied in the paper: analysis of scientific publications, analysis of the survey data. For survey data analysis - descriptive statistical analysis, cross tabulation, Mann-Whitney U test were applied.

The obtained results show that Latvian inhabitants' confidence in politicians and decision makers, competent supervisory and control authorities, mass media, enterprises responsible for GMO elaboration, scientists responsible for the risk assessment of GMO, organisations that protect consumer rights, food producers and traders and environmental activists and environmental protection organisations towards GMO was low. From all sources of information on GMO, most trustful source of all Latvia inhabitants was scientists responsible for the risk assessment of GMO and environmental activists and environmental protection organisations.

Key words: GMO, consumer attitude, survey, statistical indicators.

JEL code: D81, I18, O31, Q18, M30.

Introduction

Recent political activities and discussions on USA – EU Trade agreement as well as CETA agreement have raised also questions on attitude towards GMO, which has been discussed at different levels: policy makers, scientists, mass media and society. The regulations adopted in the European Union are very precautionary towards GMO, but in some countries of the world, including the USA the support for GM food, feed and pharmaceuticals is higher. Researchers world-wide have made numerous research on GMO issues in many fields of science and national economy. Research on consumers' attitude towards GMO is monitored by *Eurobarometer* on regular basis in all European countries.

The aim of this paper is to analyse attitude of inhabitants' confidence in politicians and decision makers, competent supervisory and control authorities, mass media, enterprises responsible for GMO elaboration, scientists responsible for the risk assessment of GMO, organisations protected consumer rights, food producers and traders and environmental activists and environmental protection organisations towards GMO. Research methods applied: scientific

publications' studies, survey of Latvia's inhabitants on analysed aspects of GMO. The tasks for research are: to evaluate scientific publications related to consumers' attitude towards GMO; to evaluate Latvia's inhabitants' trust in various sources of information towards GMO and compare the results of the survey by age group and gender. The survey of Latvia's inhabitants was conducted from September 2014 until June 2015. To ensure random selection of respondents included in the sample – to apply random sample approach (by use of systematic sample), telemarketing company was hired that applied their inhabitant data base and made telephone calls to respondents with invitation to participate in the survey and giving instructions on participation in the survey. If the respondent had not replied, next call was given to selected respondent in two weeks with reminder to fill the survey. If after the second reminder it was not done, then it was reminded third time. For questionnaire designed, especially for the inhabitant's survey, authors applied evaluation scale 1 – 10 to evaluate the attitude of inhabitants, where 1 – do not support at all; 10 – fully support. For survey data analysis,

descriptive statistics (indicators of central tendency or location and indicators of variability or dispersion), cross tabulations, Mann-Whitney U test, Kruskal Wallis test were applied.

Research results and discussion

Scientific research and consequently scientific publications on public attitude towards GMO are developed in many countries and related to all aspects of GMO in relation to consumers' trust to different sources of information on GMO, studies are published in extensive scientific monograph, edited by scientists from the USA and Italy (Evenson and Santaniello edit., 2006), on EU expert's attitude towards GMO (Aleksejeva, 2014), on Latvia's inhabitants attitude towards GMO (Aleksejeva, 2016, Aleksejeva *et al*, 2016), on different strategies and sources of information on GMO (Vigani, Olper, 2013), aspects on perception of GMOs by scientists and practitioners and the critical role of information flow about transgenic organisms is on research agenda of several scientists (Malyska *et al.*, 2014), on determining group and individual concerns regarding genetic engineering (Frewer *et al*, 1997), on consumer acceptance of transgenic crops (Frewer *et al*, 1998), scientific discussions are carried out also on issues of consumers' knowledge level and influence of this knowledge on attitude towards GM food (Cuite *et al*, 2005), on consumers attitude and policy makers (Baker and Burnham, 2001).

Multi-country assessment on consumers' acceptance and willingness to pay for GM vegetable oil and salmon was performed by researchers from the USA, Japan, Norway and Taiwan (Chern *et al*, 2002), on consumers' attitude towards labelled and unlabelled GM food products (Soregaroli *et al*, 2003), on applications for food (Brady and Brady, 2003). Extensive research on consumers' knowledge and choice (Noussair *et al*, 2002), on consumers' trust in new technologies including GMO (Roller, 2001), on how much the consumers trust in food selection and GMO across national cultures

(Priest *et al*, 2003). Several recent research has been conducted in various fields and in many countries to evaluate consumers' attitude towards GMO for feed (Turkac, 2016), on consumers' attitude towards GMO for pharmaceuticals (Vazquez-Salat, 2013), (Straub, 2002), for wine production (Plahuta, 2007), (Pretorious, 2000).

There are evaluated aspects of labelling of GMO in the USA – how consumers want to see it done – those aspects were investigated in detail by American researchers' group (Teisl *et al*, 2003). Analysis of trust in information sources on GMO are analysed in different countries: Italy (Bocchetti and Moro, 2000), comparative analysis on consumers attitude in Italy and the USA (Harrison *et al*, 2004), results on consumer attitude towards GMO and source of information on GMO in Norway (Grimsrud, 2002), in Spain (Lujan and Todt, 2000), in Singapore (Subrahmanyam *et al.*, 2000). and in the USA (Hallman *et al*, 2002).

Several research methods are used in scientific publications world-wide to measure consumers' attitude towards GMO and GM including information source evaluation: indicators of central tendency or location, indicators of variability, as well as regression analysis (Soregaroli *et al*, 2003), (Hossain and Onyango, 2004).

In research community, the extensive and deep scientific discussions on experimental investigation of consumer willingness to pay for non-GM foods when an organic option is present are carried out with more and more emotions of different parts of society (Bernard *et al*, 2006).

The European Commission performs extensive document publications and legislation update on regular basis (European Commission, 2017).

The survey of Latvian inhabitants was conducted in 2014 and 2015. The systematic sample was used in order to ensure a random sample approach and selection of respondents' randomly. That was not an easy task as the GMO

issues are very sensitive and some part of society has very emotional attitude in conversations on GMO issues. The list of potential respondents for Latvian inhabitants was gained from telemarketing company inhabitants' data base. The hired telemarketing company made telephone calls to potential respondents with invitation to participate in the survey and also giving instructions on participation in the survey. There were three approaches for respondents included in the sample if: the selected respondent had not responded in two weeks, reminder was given in two weeks and third reminder - after next two weeks. The number of respondents in the survey was 1184. For deeper analysis of respondents' attitude towards GMO, evaluations scale 1 to 10 was used.

The support of Latvian inhabitants for the use of GMO was low. About 37 % did not support the use of GMO in pharmacy, about 50 % for improving the properties of crops, about 74 % for genetically modified animals, about 64 % for genetically modified animals feed.

Latvian inhabitants' confidence in politicians and decision makers, competent supervisory and control authorities, mass media, enterprises responsible for GMO elaboration, scientists responsible for the risk assessment of GMO, organisations that protect consumer rights, food producers and traders and environmental activists and environmental protection organisations towards GMO was low. Most of all Latvian inhabitants had confidence in scientists responsible for the risk assessment of GMO and also in environmental activists and environmental protection organisations with 7 or more points – median values were 7 points, arithmetic mean values were 6.3 and 6.2 points, mode values 8 and 7 points, respectively, the evaluations were quite heterogeneous (standard deviation – 2.59 and

2.52, respectively). Less part of Latvian inhabitants had confidence in politicians and decision makers and food producers and traders, median – 3 points, arithmetic mean – 3.1 and 3.2 points, respectively, mode – 1 point, the evaluations were heterogeneous (standard deviation – 2.24 and 2.16, respectively) (Table 1).

Table 1

Statistical indicators of respondents' evaluations on confidence

| Factors | Mean | Median | Mode | Standard deviation | Minimum | Maximum |
|--|------|--------|------|--------------------|---------|---------|
| Politicians and decision makers | 3.1 | 3 | 1 | 2.2 | 1 | 10 |
| Competent supervisory and control authorities | 5.6 | 6 | 5 | 2,5 | 1 | 10 |
| Mass media | 4.1 | 4 | 5 | 2.2 | 1 | 10 |
| Enterprises responsible for GMO elaboration | 3.9 | 4 | 1 | 2.7 | 1 | 10 |
| Scientists responsible for the risk assessment of GMO | 6.3 | 7 | 8 | 2.6 | 1 | 10 |
| Organisations protected consumer rights | 5.6 | 6 | 5 | 2.5 | 1 | 10 |
| Food producers and traders | 3.2 | 3 | 1 | 2.16 | 1 | 10 |
| Environmental activists and environmental protection organisations | 6.2 | 7 | 7 | 2.52 | 1 | 10 |

Source: authors' calculations based on Latvia inhabitants' survey conducted by Inese Aleksejeva, 2014 – 2015, n=1184, evaluation scale 1 – 10, where 1 – do not trust at all; 10 – fully trust

The females' confidence in scientists responsible for the risk assessment of GMO, organisations that protect consumer rights and environmental activists and environmental protection organisations was higher than males' evaluations were (Table 2). The evaluations of females and males' evaluations differed

statistically significant, proved by the result of Mann-Whitney U test, $p \leq 0.002$.

Table 2

Average values of females and males evaluations

| | Females | | | Males | | |
|---|---------|--------|------|-------|--------|------|
| | Mean | Median | Mode | Mean | Median | Mode |
| Politicians and decision makers | 3.2 | 3 | 1 | 3.1 | 2 | 1 |
| Competent supervisory and control authorities | 5.7 | 6 | 5 | 5.4 | 6 | 7 |
| Mass media | 4.1 | 4 | 5 | 4.0 | 4 | 5 |
| Enterprises responsible for GMO elaboration | 4.0 | 4 | 1 | 4.0 | 4 | 1 |
| Scientists responsible for the risk assessment of GMO | 6.5** | 7 | 8 | 5.8** | 6 | 8 |
| The organisations protected consumer rights | 5.7* | 6 | 5 | 5.2* | 5 | 5 |
| Food producers and traders | 3.2 | 3 | 1 | 3.1 | 3 | 1 |
| Environmental activists and environmental protection organisation | 6.4** | 7 | 7 | 5.8** | 6 | 7 |

* $p=0.002$; ** $p<0.001$

Source: authors' calculations based on Latvia inhabitants' survey conducted by Inese Aleksejeva, 2014 – 2015, $n=1184$, evaluation scale 1 – 10, where 1 – do not trust at all; 10 – fully trust

For all evaluated sources of information on GMO, scores given by female respondents were higher. The females' evaluations and males' evaluations were heterogeneous (standard deviation values greater than 2.10 points).

Young people (aged 18 to 39) bit higher have evaluated confidence in politicians and decision makers, as well as enterprises responsible for GMO elaboration, as well as food producers and

Bibliography

1. Aleksejeva, I. (2014). EU Experts' Attitude towards Use of GMO in Food and Feed and Other Industries. *Procedia - Social and Behavioral Sciences*, Volume 110, pp. 494 – 501.
2. Aleksejeva, I. (2016). An Empirical Study of Latvian Consumers' Attitudes and Perceptions towards Genetically Modified Organisms, *European Integration Studies*, Volume 10, pp. 157-168.
3. Aleksejeva, I., Sloka, B., Kantane, I., Vilcina A. (2016). Attitude towards GMO in Latvia – Results of Inhabitants' Survey. *Economic Science for Rural Development: Integrated and Sustainable Regional Development, Production and Co-operation in Agriculture*. Issue 42, pp. 194-199.

traders; the evaluations differed statistically significant (Mann-Whitney U test, $p<0.05$), but on the whole the evaluations were low (average values were around 3 points).

Conclusions, proposals, recommendations

- 1) In general, Latvian inhabitants' confidence in several sources of information on GMO: politicians and decision makers; competent supervisory and control authorities; mass media; enterprises responsible for GMO elaboration, scientists responsible for the risk assessment of GMO; organisations protecting consumer rights; food producers and traders and environmental activists and environmental protection organisations towards GMO was low.
- 2) From all sources of information on GMO, most of all Latvian inhabitants trusted to scientists responsible for the risk assessment of GMO and environmental activists and environmental protection organisations.
- 3) Young people (aged 18 to 39) had a bit higher evaluated trust in sources of information on GMO such as politicians and decision makers, enterprises responsible for GMO elaboration, food producers and traders.

Analysing the females' evaluations and males' evaluations on trust in information source in scope of all evaluated sources of information towards GMO, female respondents had given higher scores that male respondents had. The evaluations by both gender respondents were heterogeneous.

Acknowledgements

The paper was supported by the National Research Program 5.2. EKOSOC-LV

4. Baker, G.A., Burnham, T.A. (2001). Consumer Response to Genetically Modified Foods: Market Segment Analysis and Implications for Producers and Policy Makers. *Journal of Agricultural and Resource Economics*, Volume 26, Issue 2, pp. 387-403.
5. Bernard, J.C., Zhang, C., Gifford, K. (2006). An Experimental Investigation of Consumer Willingness to Pay for Non-GM Foods When an Organic Option Is Present. *Agricultural and Resource Economics Review*. Volume 35, Issue 2, pp. 374-385.
6. Boccaletti, S., Moro, D. (2000). Consumer Willingness to Pay for GM Food Products in Italy. *AgBioForum*, Volume 3, Issue 4, pp. 259-267.
7. Brady, J.T., Brady, P.L. (2003). Consumers and Genetically Modified Foods. *Journal of Family and Consumer Sciences*. Volume 95, pp. 12-18.
8. Chern, W.S., Rickertsen, K., Tsuboi, N., Fu, T.-T. (2002). Consumer Acceptance and Willingness to Pay for Genetically Modified Vegetable Oil and Salmon: A Multiple-Country Assessment. *AgBioForum*, Volume 5, Issue 3, pp. 105-112.
9. Cuite, C.L., Aquino, H.L., Hallman, W.K. (2005). An Empirical Investigation of the Role of Knowledge in Public Opinion about GM Food. *International Journal of Biotechnology*, Volume 7, Issue 1-3, pp. 178-194.
10. Frewer, L.J., Hedderley, D., Howard, C., Shepherd, R. (1997). 'Objection' Mapping in Determining Group and Individual Concerns Regarding Genetic Engineering. *Agriculture and Human Values*, Volume 14, Issue 1, pp. 67-79.
11. Frewer, L.J., Howard, C., Aaron, J.I. (1998). Consumer Acceptance of Transgenic Crops. *Pesticide Science*, Volume 52, Issue 4, pp. 388-393.
12. Grimsrud, K., McCluskey, J., Loureiro, M., Wahl, T. (2002). Consumer Attitudes Toward Genetically Modified Food in Norway. *Journal of Agricultural Economics*, Volume 55, Issue 1, pp. 75 -90.
13. Hallman, W.K., Adelaja, A.O., Schilling, B.J., Lang, J. (2002). Public Perceptions of Genetically Modified Foods: Americans Know not What They Eat. Publication No. RR- 0302-001, Food Policy Institute, Rutgers University. A Food Policy Institute Publication, New Brunswick, NJ, pp. 1-62.
14. Harisson, J.W., Boccaletti, S., House, L. (2004). Risk Perceptions of Urban Italian and United States Consumers for Genetically Modified Foods. *AgBioForum*, Volume 7, Issue 4, pp. 195-201.
15. Hossain, F., Onyango, B. (2004). Acceptance of Genetically Modified Foods. *International Journal of Consumer Studies*, Volume 28, Issue 3, pp. 255-267.
16. European Commission (2017). Genetically Modified Organisms – official webpage of EC. Retrieved: http://ec.europa.eu/food/plant/gmo_en. Access: 18.01.2017.
17. Evenson, R.E., Santaniello, V. edit. (2006). Consumer Acceptance of Genetically Modified Foods. CABI Publishing. 245 p.
18. Lujan, J.L., Todt, O. (2000). Perceptions, Attitudes and Ethical Valuations: The Ambivalence of the Public Image of Biotechnology in Spain. *Public Understanding of Science*, Volume 9, Issue 4, pp. 383-392.
19. Malyska, A., Maciagi, K., Twardowski, T. (2014). Perception of GMOs by Scientists and Practitioners – the Critical Role of Information Flow about Transgenic Organisms. *New Biotechnology*, Volume 31, Issue 2, pp. 196-202.
20. Noussair, C., Robin, S., Ruffieux, B. (2002). Do Consumers not Care about Biotech Foods or do they Just not Read the Labels? *Economics Letters*, Volume 75, Issue 1, pp. 47-53.
21. Plahuta, P., Tivadar, B., Raspor, P. (2007). Slovenian Public Opinion Regarding Genetically Modified Organisms in Winemaking. *Acta Alimentaria*, Volume 36, Issue 1, pp. 61-73.
22. Pretorius, I.S. (2000). Tailoring Wine Yeast for the New Millennium: Novel Approaches to the Ancient Art of Winemaking. *Yeast*, Volume 16, Issue 8, pp. 675-729.
23. Priest, S.H., Bonfadelli, H., Rusanen, M. (2003). The "Trust Gap" Hypothesis: Predicting Support for Biotechnology across National Cultures as a Function of Trust in Actors. *Risk Analysis*, Volume 23, Issue 4, pp. 751-766.
24. Roller, S. (2001). Genetically Modified Foods: Threat or Opportunity? *Food Technology and Biotechnology*, Volume 39, Issue 4, pp. 259-263.
25. Soregaroli, C., Boccaletti, S., Moro, D. (2003). Consumer's Attitude towards Labelled and Unlabelled GM Food Products in Italy. *International Food and Agribusiness Management Review*. Volume 6, Issue 2, pp. 111 – 127.
26. Straub, J.O. (2002). Environmental Risk Assessment for New Human Pharmaceuticals in the European Union According to the Draft Guideline/Discussion Paper of January 2001. *Toxicology Letters*, Volume 135, Issue 3, pp. 231-237.
27. Subrahmanyam, S., Cheng, P.S. (2000). Perceptions and Attitudes of Singaporeans toward Genetically Modified Food. *Journal of Consumer Affairs*, Volume 34, Issue 2, pp. 269-290.
28. Teisl, M.f, Garner, L., Brian R., Vayda, M.E. (2003). Labeling Genetically Modified Foods: How Do US Consumers Want to See It Done? *AgBioForum*, Volume 6, Issue 1&2, pp. 48-54.
29. Turkec, A., Lucas, S.J., Karacanli, B., Baykut, A. Yuksel, H.. (2016). Assessment of a Direct Hybridization Microarray Strategy for Comprehensive Monitoring of Genetically Modified Organisms (GMOs). *Food Chemistry*, Volume 194, Volume 1, pp. 399-409.
30. Vázquez-Salat, N. (2013). Are Good Ideas Enough? The Impact of Socio-Economic and Regulatory Factors on GMO Commercialisation. *Biological Research*, Volume 46, Issue 4, pp. 317-322.
31. Vigani, M., Olper, A. (2013). GMO standards, endogenous policy and the market for information, *Food Policy*, Volume 42, pp. 32 – 43.

HOUSEHOLD PRO-ENVIRONMENTAL BEHAVIOR DEVELOPMENTS IN LATVIA: BEHAVIORAL PRACTICE AND VALUES ORIENTATION

Janis Brizga¹, Dr.geogr., Janis Ikstens², Dr.sc.pol.; Kristine Gaugere¹, MScPol.;
Raimonds Ernsteins¹, Dr.hab.paed.

¹Department of Environmental Science, University of Latvia; ²Department of Political Science, University of Latvia

Abstract. There is a consensus among environmental scientists, that existing household behavior patterns cause a wide range of environmental impacts. This study is based on the data acquired through the nation-wide public opinion survey carried out in Latvia in March 2016 (n 1009), covering pro-environmental behavior practice and personal value orientations. The initial findings reveal that people are concerned about the environmental problems and at least half of them are willing to reduce their environmental impact. However, as it is clear from the majority of related studies during the past decades, these concerns and good intentions rarely lead to real pro-environmental behavior. This paper investigates the link between values, current household behavior patterns, environmental impact and willingness to act pro-environmentally. The key conclusion is that values have a slight positive correlation with current (carbon footprint) as well as intended (Willingness to Act Index) pro-environment behavior and it brings us closer to the understanding of underlying motivations behind household behavior; however, results from the regression analysis clearly indicate that values explain only small part of our pro-environmental behaviors. It will help us to shape the most appropriate and selectively targeted interventions as for next steps towards sustainable development goals.

Key words: pro-environmental behavior, value-orientations, carbon footprint, willingness to act.

JEL code: D10

Introduction

The research-based evidence clearly indicates that improvement of environmental quality depends on the knowledge, attitudes, values and behavior of people (Schultz et al., 1995). Therefore, household behavior patterns that have led to the majority of current environmental problems (Brizga et al., 2017, Giljum et al., 2013, Barrett et al., 2013, Tukker et al., 2006, Tukker, 2014) must be changed, in order to ensure progress towards environmentally friendly and sustainable society (Lozano, 2007).

Pro-environmental behavior is becoming more and more popular all over the world and also in Latvia. People's interest in environmental and health aspects of consumption is increasing. A bit less than 15 % respondents identify themselves as *certainly green thinking* and 50 % of all households identify themselves as *rather environmentally friendly*. It seems that *green* is becoming the new black! However, the question remains: *how much of this thinking and talking is resulting in a real pro-environmental behavior that in turn would lead to decreased environmental impact?*

This paper is based on the value – action – impact approach. Therefore, we consider

essential exploring value orientation in general and examining links between values and environment related behavior. Being fully aware that values are not the only predictor of pro-environmental behavior, we assume that they have a role to play. Even more, it has been theoretically reasoned and empirically validated that values play a significant role in explaining specific beliefs and behavior and can, therefore, be used as predictors for various variables such as attitudes and behavioral intentions (Stern, 2000, Stern and Dietz, 1994, Howell, 2013). We investigate the link between environmental behavior, values, and environmental impacts, by exploring the following questions: *is pro-environmental behavior more driven by value orientation or socioeconomic factors or infrastructure?* Which values more than others support pro-environmental behavior? And finally, *- how can we encourage and stimulate pro-environmental behavior?*

In this paper, we do not touch upon issues related to infrastructure, normative and legal framework. We also do not measure cognitive factors like knowledge and understanding related to pro-environmental behavior.

Values and pro-environmental behavior

Literature overview

Impressive amount of research papers has been written on issues related to pro-environmental behavior. Research findings are univocal that pro-environmental behavior is strongly linked to a variety of factors – some underline the importance of cognitive factors (knowledge, skills), some emphasize affective factors, some focus on values, attitudes and norms, and the value-action gap is widely acknowledged.

Schwartz's theory of Values

In this paper, we will focus on value orientation and links between values, environment related behavior and pro-environmental intentions. The term 'value' is used in this paper following Schwartz (1992) as "a desirable trans-situational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity" and basic Human values theory, developed by Schwartz, is a key component of the theoretical framework of this paper. The theory specifies a comprehensive set of 10 motivationally distinct value constructs. Set of values within the framework of this theory is organized in a circular structure that portrays the total pattern of relations of conflict and congruity among values postulated by the theory (Schwartz, 1992).

The circular structure of values provides an opportunity for further grouping of values. Several bipolar dimensions, summarizing oppositions between competing values can be traced. In this paper, we focus on contracts between self-enhancement and self-transcendence values. This dimension captures the conflict between values that emphasize concern for the welfare and interests of others (universalism, benevolence) and values that emphasize the pursuit of one's own interests and relative success and dominance over others (power, achievement).

According to Schwartz, values underlie our attitudes; they are the basis for our evaluations. We evaluate people, behaviors, events, etc. positively if they promote or protect attainment of the goals we value (Schwartz, 2012).

Three decades ago (1986- 1987) Hines and the research team after conducting a large-scale meta-analysis on pro-environmental behavior discovered a significant correlation between pro-environmental attitudes and pro-environmental behavior ($r .38,$) and between pro-environmental behavioral intention and pro-environmental behavior ($r .49$) (Hines et al., 1987). Value-belief-norm theory (Stern, 2000, Stern et al., 1999) suggests that values are the first link in a causal chain influencing worldviews, awareness of negative consequences of behavior, and ascription of personal responsibility for those consequences (Howell, 2013).

Some values, more than others tend to explain predisposition for pro-environmental behavior. Defining the goal of universalism (that together with benevolence forms self-transcendence value orientation), according to Schwartz is appreciation, tolerance, and protection for the welfare of all people and for nature. People who rank universalism high in their value system may realize that failure to protect the natural environment will lead to the destruction of the resources on which life depends (Schwartz, 2012).

Several studies have shown that people who give priority to collective, or self-transcendent, values are more willing to engage in different forms of altruistic, cooperative, or pro-environmental behavior than people who give priority to individual or self-enhancement values (Nordlund and Garvill, 2002). Recent research carried out in Lithuania suggests that people who are attributed with self-enhancement and are guided by more hedonistic goals do not tend to behave in a manner that contributes to saving environmental resources. However, a positive

and statistically significant correlation was observed between self-enhancement values and pro behavior practices (Liobikienė and Juknys, 2016).

The research carried Stern & Diaz empirically tie environmentalism to certain basic human values. They link behavioral indicators of environmentalism to biospheric-altruistic and (inversely) egoistic value orientations. It also indicates little or no effect on traditional values or openness to change (Stern and Dietz, 1994).

At the same time research carried out by Karp (1996) indicates the effect of Self/Transcendence/ Openness to Change and Universalism/Biospheric as positive predictors in all types of pro-environmental behavior (Karp, 1996).

Nevertheless, we cannot consider that holding certain values will directly lead to pro-environmental behavior. The mismatch between values and behavior or value-action gap widely researched phenomenon (Anable et al., 2006, Blake, 1999).

For example, as noted by Nordlund and Garvill (2002) the reason why reporting certain values or even self-identification as an environmental activist may not lead to pro-environmental behavior may be that the choice between acting in a pro-environmental way and not doing so often involves a conflict between immediate individual and long-term collective interests. The individual benefits obtained from traveling by car, buying food and other products without consideration of negative environmental impacts, not recycling, and not conserving energy in the household are immediate, whereas the negative environmental effects of such behaviors are often uncertain consequences in the future.

Another reason for the value-action gap could be a strong influence of habitual behavior. One possible explanation for the failure to change for more environmentally friendly behavior is offered by Verplanken: many aspects of unwanted

lifestyle habits are immediately gratifying (Verplanken, 2006, Verplanken et al., 2005).

There is only limited research on pro-environmental behavior, household environmental concerns, values and sustainable consumption patterns carried out in Latvia. They reveal that most of the people in Latvia do not think their behavior has a negative impact on the environment and identify several barriers to sustainable consumption, such as the lack of information, perceived consumer effectiveness, difficulties to change habits, and perception of high costs associated with sustainable consumption exist (Auzane and Elere, 2008, EC, 2011, SKDS, 2008). There is also a clear need for changes in the systems of provision, relevant knowledge, infrastructure and resources to facilitate switching to low carbon lifestyles (Brizga, 2012, Brizga et al., 2017), particularly stressing the role of complementary communication instruments to be applied (Brizga and Ernsteins, 2016).

Methodology

This paper is elaborated by using data acquired through the nationally representative public opinion survey (n – 1009) conducted in Latvia in March 2016. Respondents were selected using a random, multi-stage sample design and face to face interviews were performed at their homes. This study is the first part of the project to be complemented with deep comparative interviews with selected regional/local households and further on continued with local municipal surveys and all local main stakeholders' interviews.

The questionnaire comprised of 67 questions. The aim of this study was to identify, compare and analyze people's behavior patterns, environmental impacts (carbon footprint) and values. The survey was structured around following broad themes: general attitudes towards the pro-environmental behavior and consumption; household environmental behavior patterns; environmental awareness, willingness

to act; individual values; and socio-demographic profile of the respondents.

While conducting the initial analysis of the acquired data, we have identified several problems that could impose certain **limitations** on our further conclusions. The data collected is based on self-identification and self-reported behavior of respondents about his/her value orientations and their whole household behaviors. They have to report their own identification level with the portraits of different people, each one describing a person's goals, aspirations, or wishes that point implicitly to the importance of a certain value. Thus, we have collected data on household behavior and individual values of respondents. So, as already presumably generally expected, almost half of those who report themselves as *certainly green thinking* do not recycle. Different discrepancy example of certain mismatch to be kept in mind when interpreting the results is regarding the monthly income of respondents - more than 20 % have stated that the average income per capita in their household is above 1000 euro per month net, but according to official statistics, less than 10 % of Latvia's workforce earn above this amount.

It is obvious that pro-environmental behavior is an extremely complex issue comprising of a wide range of various behavioral acts. To analyze our data we have computed a Willingness to Act Index. It includes the answer to the question *How important is the protection of the environment to you personally?* as well as a willingness to perform 14 different behavioral changes that would lead to lower environmental impact. Suggested behavioral changes, e.g. are *consuming more organically farmed foods, driving less, recycle, co-operate with friends and neighbors (sharing household tools, carpooling), increase knowledge about environmentally friendly lifestyle*. An index is a number ranging from 15 (willing to do all the listed changes and concerned about the environment) to 32

(unwilling to change anything and not concerned about the environment).

Carbon footprint was used to indicate household environmental impact. 18 questions from the survey were used to calculate the carbon footprint of consumption activities. They were structured around the three main consumption clusters of housing (including energy, water, and waste), mobility, and food. These clusters were selected as they are responsible for 70-80 % of all the household consumption environmental impacts (Tukker et al., 2006, Brizga et al., 2017). For the benchmarking, we used the results of the latest multiregional input-output analysis of household consumption carbon footprint in Latvia (Brizga et al. 2017).

To identify the **value-orientation** of respondents, we use the shortened version of Schwartz's Portrait Values Questionnaire (PVQ) describing portraits of 21 different people. Regarding each portrait, respondents answer the question: "How much like you is this person?". Six labeled responses range from "not like me at all" to "very much like me." This tool was developed for use with representative national samples in large surveys when time is limited.

In order to evaluate determinants of pro-environmental behavior, we used a correlation analysis and regression model including socio-demographic variables (age, education, language, and income) as well as variables of Schwartz value-orientations. The model was estimated using linear (adjusted R^2) and logistic (Nagelkerke R^2) regression.

Research results and discussion

As suggested by Stern (2000), there is a complex of interactions of psychological, social and physical factors in the production of behavior, and after the initial analysis of the data collected, we can totally agree with Stern's statement.

Even though 81 % of our respondents have indicated that *Protection of the environment is*

either very important (23 %) or rather important (58 %) to them, their behavior does not match the criteria of being environmentally friendly.

Describing their food consumption patterns more than 1/3 of respondents admit, they consume meat every day (37.7 %) or at least 2 – 3 times a week (48,8 %). 59.5 % do not recycle, only 15.3 % have their dwelling totally insulated and only 32.9 % drive cars that consume less than 6.5 liters of fuel per 100km. The most common pro-environmental behavior is using reusable shopping bag. 48.7 % of our respondents report using it always and 38 % - using it sometimes.

Being *green* or environmentally friendly means different things to different people. In the survey, we asked people to identify whether their household is environmentally friendly. 13.1 % identified themselves as *certainly green thinking*; 41.9 % identified themselves as *rather environmentally friendly*, 26.3 % admitted that they are trying to be environmentally friendly if it does not interfere with their daily routines and undermine comfort and 15.6 % confessed that they do not think about their household in terms of environmental friendliness.

If 55 % of respondents admit they are *rather environmentally friendly* or *certainly green thinking*, it sounds, like a good news for polar bears, but when we look at the behavior pattern, a totally different picture is revealed. Almost 50 % of those who identify themselves as *certainly green thinking* do not recycle. Analysis of their driving patterns revealed that 30 % of those certainly green thinking go food shopping by car most of the time. Only 25 % of them do not have a car at all. 20 % of our survey participants drive between 50–100 km per week. 61 % of those drivers have identified themselves as *certainly green thinking* or *rather*

environmentally friendly. Exactly the same percentage of certainly green thinking or rather environmentally friendly people is among those who drive 101 – 500 km per week.

Apparently, *certainly green thinking* or *rather environmentally friendly* people are the most frequent flyers too – they make up almost 60 % out of all respondents who have been flying last year.

The same trend is identified in food consumption pattern. 37.8 % of our respondents consume meat or meat products every day and 59.8 % of them are *certainly green thinking* or *rather environmentally friendly* people. 23 % of our respondents consider inexpensive price the key factor in choosing food and 50.8 % of them have identified themselves as *certainly green thinking* or *rather environmentally friendly* people.

Willingness to Act Index

Our respondents scored high in the Willingness to Act Index (WAI). Scores of 27 % of respondents are in the range from 15 to 18, meaning they are ready to change up to 80 % of behavioral acts in order to reduce their environmental impact. 70 % of respondents are ready to start recycling, but only 25 % are willing to cooperate with friends and neighbors. 39.9 % are ready to change their driving pattern, however, 44.4 % are not ready to reduce driving.

Correlation analysis demonstrates that highest Willingness to Act Index (WAI) is in the group with income between 351 and 720 EUR a month (Table 1). Women are more likely to act environmentally friendly than man. WAI also correlates with respondent's education, housing type, and geographical region. Women and people from Latgale (a most underdeveloped region in Latvia) seem to have higher willingness to act environmentally friendly.

WAI and housed income (number of respondents)

| Willingness to act | Net per capita income (EUR) | | | | | WAI (Total) |
|-------------------------------|-----------------------------|---------|----------|-----------|------------|-------------|
| | Below 350 | 351-720 | 721-1000 | 1001-1300 | Above 1301 | |
| Highly willing to act (15-18) | 9.7 % | 33.9 % | 17.7 % | 22.6 % | 16.1 % | 6 % |
| Moderately willing (19-22) | 10.3 % | 29.5 % | 24.0 % | 24.0 % | 12.2 % | 33 % |
| Not really willing (23-27) | 10.7 % | 28.5 % | 22.9 % | 26.4 % | 11.5 % | 47 % |
| Unwilling to act (28-32) | 11.3 % | 24.1 % | 27.0 % | 24.1 % | 13.5 % | 14 % |
| Income (total) | 10.6 % | 28.5 % | 23.5 % | 25.1 % | 12.3 % | 100.0 % |

Source: author's calculations based on the survey data

The WAI is also higher among those living in the countryside rather than in the capital Riga or other towns; it is also related to the housing type – higher willingness to act is among people living in the single family dwellings and dwellings with few (3-10) apartments, compared to those living in the multi-apartment buildings. Similar results were obtained by the study looking at the people climate awareness (BEF, 2016).

Carbon footprint

Carbon footprint analysis shows that average per capita footprint in Latvia is around 6 tons of CO_{2e} per year and man (6.1 t CO_{2e}) have slightly higher footprint than women (5.8 t CO_{2e}). Results also demonstrate slight carbon footprint differences among age groups (Figure 1). Lowest carbon footprint (5.5 t CO_{2e}) is among the

youngest participants in the survey (age 18-24), but then for the age group 25-34 it raises by 13 % reaching 6.3 t CO_{2e} per capita and gradually decreases with the age.

40 % of the carbon footprint is generated by food consumption, 22 % - by the housing sector and consumption of other goods and services and 17 % are transport related emissions. Most significant differences in the carbon footprint can be identified in the transport sector – where oldest participants in the survey have less than 50 % of the average transport footprint. At the same time, carbon footprint from housing and other goods is increasing with the age. These changes are very much related to the changes in the income and the number of people in the household.



Source: author's calculations based on the survey data

Fig. 1. Carbon footprint (kg CO₂) distribution among the age groups

Results also prove once again the value-action gap in the society – carbon footprint does not

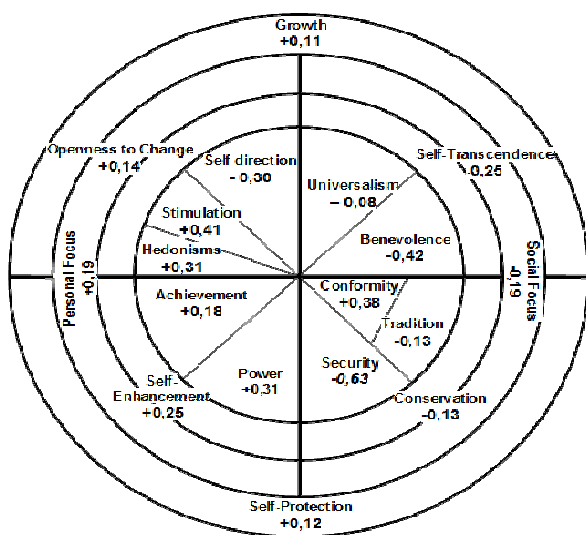
have a strong linear correlation with WAI. Those

with the lowest footprint are not the same who score the best in the Willingness to Act index.

Value orientation and pro-environmental behavior

A full outline of scores calculated from the Schwartz's PVQ is indicated below. Results demonstrate that the dominant value in Latvian society is security (scoring -0.63), followed by benevolence (scoring -0.42) and self-direction (scoring -0.30). The least dominant values are stimulation, conformity, and power, (scoring 0.41, 0.38 and 0.31 respectively) (Figure 2). The circular value structure is also proven to work rather well both when it comes to individual values and when it comes to clusters of values.

There is a rather strong inverse correlation between self-transcendence and self-enhancement values, as well as between conservation and openness to change. Chronbach's alpha for self-transcendence is .537 and for self-enhancement, it is .449. Pearson's correlation between self-transcendence, and self-enhancement is -.642 and correlation between conservation and openness to change is -.759.



Source: author's calculations based on the survey data

Fig. 2. Value-orientations in Latvia's society (average) according to the Schwartz model. (Centered scale. Low numbers mean higher identification with certain value)

Most of the linear correlations between values and WAI are statistically significant but weak. WAI and a carbon footprint have a positive correlation with security as well as self-transcendence values but have a negative correlation with hedonism, power, conformity, and tradition.

Consumption of predominantly **locally grown food** has a slight negative linear correlation with self-transcendence values ($r=-.148$, $p<.05$) and very slight positive correlation with self-entertainment values ($r=.065$, $p<.01$). However, self-transcendence values have also a slight negative linear correlation with income, which could serve as an explanation for food consumption pattern.

There is a slight correlation between values and using a **car for grocery** shopping. Those with self-transcendence values tend not to use it ($r=.091$, $p<.05$), in turn, those with self-entertainment values tend to use ($r=-.105$, $p<.05$).

Pro-environmental behavior and socioeconomic factors

Generally, socioeconomic factors do not serve as predictors of pro-environmental behavior in Latvia. At the same time, some linear correlations are statistically significant. For example, income has a slight positive correlation with a preference for locally grown food ($r=.151$, $p<.05$), as well as with the use of energy efficient (LED) lights ($r=.149$, $p<.05$) at home. Education level correlates with the importance of environmental protection. The higher education, the more important is environmental protection ($r=.124$, $p<.05$).

In order to test for the impact of values and a range of demographic variables upon changes in consumption over the last two years, linear regression analysis was performed. Results from the linear regression analysis demonstrate that the explanatory power of the model is poor (adjusted R^2 being between 0.02 and 0.08). Consumption of transportation services

constitutes a major exception as values such as benevolence, stimulation, hedonism and achievement all have had a statistically significant effect on the use of transport. Meanwhile, age appears to have a more extensive impact across several areas of consumption. Other aspects of consumption emerge as linked to various values. A choice of a fuel-efficient vehicle is negatively related to conformity and benevolence. The introduction of LED bulbs to the household is negatively associated with security and self-direction while preference for organic food is negatively linked to universalism.

The highest explanatory power ($R^2=0.08$) of the model is for the use of the reusable shopping bags. The more respondents subscribe to power ($\beta=.19$, $p<.01$), stimulation ($\beta=.18$, $p<.01$), conformity ($\beta=.17$, $p<.01$) values, the higher their use of the reusable shopping bags. Furthermore, the older is a person (age, $\beta=.11$, $p<.01$), lower are per-capita income ($\beta=.16$, $p<.01$), the higher use of the reusable shopping bags. But the Russian language ($\beta=-.11$, $p<.01$) is negatively related to the use of the reusable shopping bags.

Results from the logistic regression analysis have much higher explanatory potential (Table 2). Security and Russian language use are statistically significant factors for three resolutions while benevolence, self-direction, stimulation and power hold relevant influence on two resolutions. Respondents who scored high on security values were less into using renewable energy, participation in environmental actions and learning about the environment. We also analyzed the impact of values on a commitment to make respondent's behavior more environmentally friendly. Somewhat surprisingly, use of Russian language in one's household has a negative impact on resolutions about environmentally friendly behavior.

As it is indicated in the previous research on sustainable consumption in Latvia (Auzane and Elere, 2008), factors that prevent consumers from consuming sustainably, are the lack of information, perceived consumer effectiveness, difficulties to change habits, the perception of high costs associated with sustainable consumption and the lack of trust in producers. Some of those factors are measured also in our study and most of the findings are similar.

Logistic regression model of the value-orientations and pro-environmental behavior

| | Recycle | Use renewable energy for heating | Participate in environmental actions | Learn more about the sustainable lifestyles |
|---------------------------------|----------------|---|---|--|
| Security | -.225 | -.482 | -.440 | -.549 |
| Conformity | -.118 | .162 | -.319 | -.005 |
| Tradition | .170 | .295 | -.258 | .087 |
| Benevolence | -.769 | -.243 | -.604 | -.373 |
| Universalism | -1.071 | -.451 | -.933 | -.533 |
| Self-Direction | -.308 | -.063 | -.444 | -.402 |
| Stimulation | -.478 | -.181 | -.547 | -.294 |
| Hedonism | .043 | -.133 | -.372 | -.221 |
| Achievement | -.114 | -.079 | -.494 | -.196 |
| Power | -.704 | -.101 | -.309 | -.572 |
| Age | .001 | -.004 | -.025 | -.011 |
| Russian language | -1.130 | -.930 | -.366 | -.490 |
| Education | -.019 | -.033 | .067 | .088 |
| Per capita income | .000 | -.001 | -.001 | -.001 |
| Nagelkerke R² | 0.206 | .155 | .152 | .147 |

Note: Bold values demonstrate variable with statistically high significance; $p < .01$.

Source: author's calculations based on the survey data

Lack of information may still be one of the essential factors undermining good intentions and green self-identification of our respondents. When asked, what are the reasons why people do not behave environmentally friendly, 17 % of our respondents mention the lack of information as a first reason. And indeed a discrepancy between self-identification as an environmentally friendly person and behavior that leads to pollution and degradation of the environment may be caused by simple lack of knowledge regarding environmental impacts of certain behaviors.

Use of reusable shopping bags appears to be the most popular pro-environmental behavior in Latvia and most of the respondents are willing to start recycling in future. However, research indicates that changing purchasing behavior generally has greater environmental benefit than reusing or recycling available products and lowering thermostat settings or reducing car use would reduce environmental impact far more than refusing plastic bags in stores (Steg and Vlek, 2009). Information campaigns even those that successfully convey information, subsequently do not necessarily change human

behaviors. It means that in order to ensure behavior change a set of complementary instruments tailored to the specific target groups should be used. (Brizga and Ernsteins, 2016).

Difficulties to change habits, even though directly not mentioned by our respondents, is widely identified as a significant contributor to a certain type of behavior. Research evidence suggests, that habitual behavior may involve misperceptions and selective attention: people tend to focus on information that confirms their choices, and neglect information that is not in line with their habitual behavior (Steg and Vlek, 2009). When judgments become automatic, people may react on the basis of past experience and be less responsive to small changes in the relevant stimuli. It means that repetition of behavior may continue even when behavior is no longer the most appropriate, effective response (Wood et al., 2002).

On the one hand, this is a bad news for promoters of pro-environmental behavior. Our results revealed the fact that 3 out of 5 respondents have the bad habit not to recycle and even though most of them have expressed a

good intention to recycle in future, it is not likely that their good intentions will turn into pro-environmental behavior. On the other hand, it could be seen as good news too - when pro-environmental behavior might become habitual, it could be hard to change it.

Conclusions

The assumption, that self-transcendence value orientation could serve as a predictor of pro-environmental behavior in Latvia, has been proven only to some extent. Self-transcendence values have a slight statistically significant positive correction with WAI and carbon footprint. This fits the general pattern and corresponds to research findings also in a neighboring country, Lithuania, where self-transcendence value orientation influences all environmentally-friendly behavior manifestations (Liobikiene and Juknys, 2016). At the same time, we can see that the carbon footprint is driven by income, which, in turn, is highly dependent on education.

And finally, the results from the regression analysis clearly indicates that **values explain only small part of our pro-environmental behaviors**. Therefore, the idea of promoting self-transcendent value orientation that could lead to pro-environmental behavior as suggested by some researchers (Liobikiene and Juknys, 2016), may not guarantee immediate results in our case.

Behavioral scientists agree that effective intervention can change habits, by applying downstream interventions (include education, informational campaigns that identify costs of

existing behaviors and benefits of new responses etc.) or upstream interventions that focus on the larger structural conditions in which people's behaviors are embedded. Thus, upstream interventions may consist of economic incentives, legislation, or structural changes in the performance environment. These interventions aim to provide contexts and societal structures that promote and sustain desired behavior (Verplanken, 2006).

We must admit that even the behavior pattern of the general public cannot be considered as environmentally friendly, most of the people tend to identify themselves as rather environmentally friendly or certainly green thinking, which means that **thinking or even being green might be a quite a desirable social identity**.

It is clear that deeper understanding of factors influencing pro-environmental behavior is crucial for formulating proper interventions towards promoting sustainable development. Therefore, further research should focus on the more detailed analysis of underlying motivations of pro-environmental behavior considering also cognitive behavioral components as well as normative, infrastructure etc. factors mentioned. It is also important to study habits and routines, as well as factors making *being green* a desirable social identity.

Acknowledgements

This work has been funded by the Latvia State Research Program SUSTINNO project "Environmentally friendly and sustainable resource use."

Bibliography

1. ANABLE, J., LANE, B. & KELAY, T. 2006. An Evidence Base Review of Public Attitudes to Climate Change and Transport Behaviour, the Department.
2. AUZANE, B. & ELERE, L. 2008. Sustainable Consumption in Latvia: Barriers and Consumer Attitude. Riga: Rigas school of economics.
3. BARRETT, J., PETERS, G., WIEDMANN, T., SCOTT, K., LENZEN, M., ROELICH, K. & LE QUÉRÉ, C. 2013. Consumption-based GHG Emission Accounting: a UK Case Study. *Climate Policy*, 1-20.
4. BEF 2016. Informetība un attieksme pret klimata parmaiņām. *Latvijas iedzīvotāju aptaujas rezultāti*. Riga: BEF.
5. BLAKE, J. 1999. Overcoming the 'Value--Action Gap' in Environmental Policy: Tensions between National Policy and Local Experience. *Local Environment*, 4, 257.
6. BRIZGA, J. 2012. Sustainable Consumption Governance in Latvia: Policy Instruments, Networks and Indicators. Ph.D., University of Latvia.

7. BRIZGA, J., ERNSTEINS, R. 2016. Sustainable Household Consumption in Latvia: Environmental Behavior and Communication Requirement. In: 3rd International Multidisciplinary Scientific Conference SGEM 2016, Proceedings, Austria, p. 555 – 566.
8. BRIZGA, J., FENG, K. & HUBACEK, K. 2017. Household Carbon Footprints in the Baltic States: A global multi-regional input-output analysis from 1995 to 2011. *Applied Energy*, 189, 780–788.
9. EC 2011. Attitudes of European Citizens towards the Environment, Eurobarometer #365. European Commission.
10. GILJUM, S., WIELAND, H., BRUCKNER, M., DE SCHUTTER, L. & GIESECKE, K. 2013. Land Footprint Scenarios. *Sustainable Europe Research Institute (SERI)*, Vienna, Austria.
11. HINES, J. M., HUNGERFORD, H. R. & TOMERA, A. N. 1987. Analysis and Synthesis of Research on Responsible Environmental Behavior: A meta-analysis. *The Journal of environmental education*, 18, 1-8.
12. HOWELL, R. A. 2013. It's Not (just) "the Environment, Stupid!" Values, Motivations, and Routes to Engagement of People Adopting Lower-carbon Lifestyles. *Global Environmental Change*, 23, 281-290.
13. KARP, D. G. 1996. Values and their Effect on Pro-environmental Behavior. *Environment and behavior*, 28, 111-133.
14. LIOBIKIENE, G. & JUKNYS, R. 2016. The Role of Values, Environmental Risk Perception, Awareness of Consequences, and Willingness to Assume Responsibility for Environmentally-friendly Behaviour: the Lithuanian Case. *Journal of Cleaner Production*, 112, 3413-3422.
15. LOZANO, R. 2007. Collaboration as a Pathway for Sustainability. *Sustainable development*, 15, 370-381.
16. NORDLUND, A. M. & GARVILL, J. 2002. Value Structures behind Pro-environmental Behavior. *Environment and behavior*, 34, 740-756.
17. SCHULTZ, P. W., OSKAMP, S. & MAINIERI, T. 1995. Who Recycles and When? A Review of Personal and Situational Factors. *Journal of environmental Psychology*, 15, 105-121.
18. SCHWARTZ, S. H. 1992. Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 countries. *Advances in experimental social psychology*, 25, 1-65.
19. SCHWARTZ, S. H. 2012. An Overview of the Schwartz Theory of Basic Values. *Online readings in Psychology and Culture*, 2, 11.
20. SKDS 2008. Latvijas iedzīvotāju aptauja: Ilgtspējīga attīstība, vertības un paradumi. Rīga: SKDS.
21. STEG, L. & VLEK, C. 2009. Encouraging Pro-environmental Behaviour: An Integrative Review and Research Agenda. *Journal of environmental Psychology*, 29, 309-317.
22. STERN, P. C. 2000. New Environmental Theories: toward a Coherent Theory of Environmentally Significant Behavior. *Journal of social issues*, 56, 407-424.
23. STERN, P. C. & DIETZ, T. 1994. The Value Basis of Environmental Concern. *Journal of social issues*, 50, 65-84.
24. STERN, P. C., DIETZ, T., ABEL, T. D., GUAGNANO, G. A. & KALOF, L. 1999. A Value-belief-norm Theory of Support for Social Movements: The case of environmentalism. *Human ecology review*, 6, 81-97.
25. TUKKER, A., BULAVSKAYA, T., GILJUM, S., DE KONING, A., LUTTER, S., SIMAS, M., STADLER, K., WOOD, R. 2014. The Global Resource Footprint of Nations. Carbon, water, land and materials embodied in trade and final consumption calculated with EXIOBASE 2.1. Leiden/Delft/Vienna/Trondheim.
26. TUKKER, A., HUPPES, G., GUINEE, J., HEIJUNGS, R., KONING, A. D., OERS, L. V., SUH, S., GEERKEN, T., HOLDERBEKE, V. M. & JANSEN, B. 2006. Environmental Impact of Products (EIPRO) Analysis of the Life Cycle environmental impacts related to the final consumption of the EU-25.
27. VERPLANKEN, B. 2006. Beyond Frequency: Habit as Mental Construct. *British Journal of Social Psychology*, 45, 639-656.
28. VERPLANKEN, B., MYRBAKK, V. & RUDI, E. 2005. The Measurement of Habit. *The routines of decision making*, 231-247.
29. WOOD, W., QUINN, J. M. & KASHY, D. A. 2002. Habits in Everyday Life: Thought, Emotion, and Action. *Journal of personality and social psychology*, 83, 1281.

CREATION OF A "GREEN" PRODUCT BRAND FOR PROMOTION OF SUSTAINABLE CATERING SERVICES IN ZEMGALE REGION

Gunta Grinberga-Zalite¹, Dr.oec., assoc.professor; Alise Ozolina², Mg.oec.

^{1, 2}Latvia University of Agriculture, Faculty of Economics and Social Development

Abstract. Nowadays, healthy lifestyle and healthy nutrition aspects are essential prerequisites for the development of any nation as it is the basics of human existence and capacity for work. Sustainable Development Strategy of Latvia until 2030 foresees to advance healthy catering services by promoting organic agriculture and sustainable way of life. To position Zemgale region as "the greenest" region in Latvia, and possibly in the entire EU, the society and catering service providers need to be aware of and have understanding of sustainability essentials. To promote sustainable eating habits in society, it is necessary to develop such a brand strategy of Zemgale region that would position this region as a green and sustainable catering service provider. In authors' opinion, Zemgale region has a potential to successfully develop its "green" product brand since Zemgale comprises more productive utilised agricultural land areas compared with the other regions of Latvia.

The aim of the research was to develop proposals for a "green" product brand foundation in Zemgale region for promotion of sustainable catering services. The research employed monographic, statistical analysis, descriptive and sociological research (questionnaire) methods. The results of the research showed that the residents of Zemgale are interested in a "green" product brand development and there are various alternatives how to position it in the market.

Key words: brand, sustainable development, catering services, promotion, Zemgale region.

JEL code: M31, R1

Introduction

Today, sustainable development is related not only to sustainable production issues, but also to a sustainable consumption. (Oslo Roundtable on Sustainable, 1994). However, often the solutions to economic development problems are associated with the need to produce and consume more, thus unsustainable use of the resources alongside with the population growth in the world leads to the depletion of the resources. The basic idea of sustainable development invites to satisfy the needs of the present generation, balancing public welfare and environmental and economic development interests and concurrently ensuring the observation of the environmental requirements and the preservation of natural diversity in order to avoid the reduction of possibilities to satisfy the needs of future generations. The planning document "Sustainable Development Strategy of Latvia until 2030" (Sustainable Development of..., 2010) includes the work of experts and various social groups. Among many other objectives determined by this document, special emphasis has been put on the enhancement of ecologically certified and healthy products, thus creating the image of Latvia as a

"green" country by promotion of sustainable eating habits.

Compared with the other regions of Latvia, Zemgale has the largest areas of utilized agricultural areas - 39 % or 414.3 thou ha, forests - 42 %, swamps - 3 %, land under water - 3 %, while the remaining land (roads, scrubs, farmyards, land occupied by buildings, etc.) - 13 % (Zemgale planning region. .., 2015). According to the data of the Central Statistical Bureau of Latvia, alongside with trade and accommodation industries agriculture, forestry fisheries, food processing are the industry groups that employ most of Zemgale population. Owing to old farming and cultural traditions in Zemgale, this region has a sound potential to develop its own branding strategy for promotion of local food by positioning it as green and healthy.

In order to position Zemgale region as "the greenest" region of Latvia and even possibly of the whole EU, it is necessary to strengthen the understanding of both businesspersons and consumers about sustainability essentials.

The aim of the present research is to develop proposals for creation of a "green" product brand in Zemgale region to promote sustainable public catering services. To reach the aim, the following

research tasks were set: 1) to explore the theoretical basis for sustainable development of Zemgale region; 2) to substantiate the need to create a product brand for promotion of sustainable catering services in Zemgale; 3) to conduct a sociological survey and in-depth expert interviews for further ideas how to develop the brand identity of the "green" product brand for sustainable catering services in Zemgale.

In the scope of the research, the authors used monographic, logical construction, graphic methods as well as sociological research methods - a survey (questionnaire) of residents and in-depth expert interviews. Statistical analysis as well as analysis and synthesis were employed to process the research data.

For secondary data analysis, the authors have used scientific publications as well as other research data available on Internet, books, the data of the Central Statistical Bureau of Latvia as well as strategic development and planning documents of Latvia.

1. Sustainable development opportunities of Zemgale region

"Sustainable Development Strategy of Latvia until 2030" or "Latvia 2030" is the main national long-term development plan that determines seven principles for the selection of further national level priorities: development of culture space; investments in human capital; change of paradigm in education; innovative and eco-efficient economy; nature as future capital; perspective of spatial development; innovative government and participation of the society. Whereas the sustainable development of Zemgale region is determined by "Zemgale Planning Region Sustainable Development Strategy 2015-2030", which is an overarching long-term planning document. The vision of this planning document is "Zemgale in 2030 - a competitive, green area in the centre of Latvia with qualitative and accessible living environment" (Zemgale planning region ..., 2015).

In assessing the sustainable development strategy, the authors recognize as important the fact that the strategy developers understand and appreciate the role of agriculture in Zemgale and agricultural land in the context of both Latvia and the EU, thus emphasizing it as a priority direction and are aspiring to develop organic farming and food industry diversification in this region.

The priority axes of the Action Plan of Zemgale Planning Region Development Programme provide a number of activities:

- to support socially responsible business development in the region by promoting the benefits and best practices;
- to coordinate joint marketing activities of small and medium-sized enterprises;
- to develop a bio-Zemgale development strategy that focuses on food security, sustainable agriculture, forestry etc. sectors;
- to promote opportunities of organically produced agricultural products' sales by enhancing co-operation among farmers;
- to implement public education measures on disease prevention and a healthy lifestyle;
- to promote the development of health services, healthy lifestyle and physical activities;
- to promote the region's gastronomic tourism development and competitiveness (Ricibas plans..., 2015).

The indicative total funding for the above named activities is EUR 3 555 000. "Zemgale Planning Region" administration budget; "The Strategic Investment Fund" (ESIF), the EU financial instrument for the programme "LIFE" and entrepreneurs are mentioned as the main sources of finance.

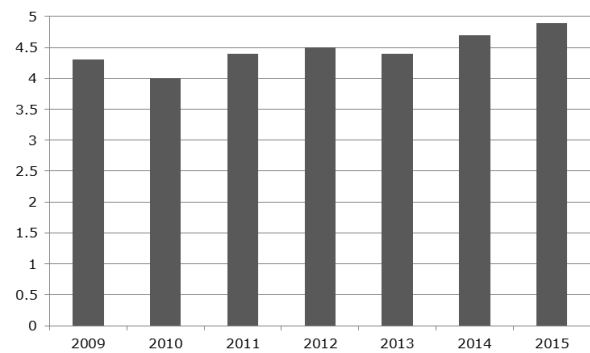
2. Creation of a "green" product brand identity and positioning for the promotion of healthy catering services

Food consumption is unique and differs from the consumption of other goods owing to both the physiological need for food and its antiquity, evolving along with the society and becoming an

integral component of culture and identity. The 2008 Latvian financial crisis, which stemmed from the global financial crisis of 2008–2009, was a major economic and political crisis in Latvia. The crisis was generated when an easy credit market burst, resulting in an unemployment crisis, along with the bankruptcy of many companies. In 2008, after years of booming economic success, the economy of Latvia took one of the sharpest downturns in the world, picking up pace in the last quarter in which GDP contracted by 10.5 %. The following years' economic downturn had a negative impact on household consumption habits and one of the positions that had most dramatic decrease was expenditure on public catering services and hotels. However, as revealed in Figure 1, today household expenditures on catering services are slowly increasing alongside with economy recovery and during the last two years have exceeded the crisis level expenditure. However, unbalanced and irresponsible consumption of food negatively affects both the health of consumers themselves and the social, economic, and ecological environments. Therefore, to avoid these problems, it is very urgent to research and promote sustainable food consumption (Handbook of research..., 2014).

The European Union has recognised that it is important to change the economy and lifestyle according to the sustainability principles; therefore, in July 2008 the European Commission submitted the Action Plan for Sustainable Consumption and Production and Sustainable Industry Policy to the European Parliament. The Action Plan aims at improving the environmental performance of products during their entire lifecycle, promoting and stimulating the demand for better products and production technologies, and to assisting consumers in making environmentally friendly decisions. The Action Plan also reviews the possibilities for popularising sustainable production and consumption in the world. The EU's support measures for sustainable

production and consumption are based on four key objectives: to improve the quality of products; to better inform consumers; to increase the efficiency of production and reduce pollution; and to support global efforts (European Commission, 2008).



Source: Household consumption expenditure, Central Statistical Bureau of Latvia, 2016

Fig. 1. Household consumption expenditure on catering services and hotels during 2009-2015, %

The actions that people take and choices they make – to consume certain products and services, or to live in certain ways rather than others – all have direct and indirect impacts on the environment, as well as on personal (and collective) well-being (Jackson T., 2005). Sustainable food is a food that is traceable at all stages of the food chain, is produced and processed by efficiently exploiting local resources of production, by taking care of the environment, biodiversity, and animal welfare, and by ensuring fair and adequate incomes for employees engaged in the food chain, as well as is healthy and safe to consumers (Dzene S., 2013). These activities are closely related with the "green" product brand foundation in Zemgale for promotion of sustainable local food services, because such products' brand development is based on boosting the demand for local organic produce, thus contributing to sustainable development of the region. No doubt, locally grown produce is fresher, which makes it taste better and ensures that the consumer is getting maximum nutrition for his/her buck, and after all the link between the producer and consumer is not lost. Important aspect is also the

strengthening of local economy, thus providing work for small farmers, creating or saving workplaces, preserving small shops and securing food. Schenk (Schenk G.W., 2016) has emphasized the importance of "regional value adding". If someone spends 10 EUR in the supermarket, about 2 EUR remain in the regional community and 8 leave the area. If someone spends 10 EUR to buy from a regional producer, 8 EUR remain in the regional community and 2 leave the area. Buying regional products can generate 4 times more the regional community than buying supra-regional. Even, if regional products would cost twice as much – comparing the supra-regional products, the regional people would gain more.

In Zemgale, the users of this "green" local brand would be socially responsible small and medium-sized enterprises that care about public health and the promotion of healthy lifestyles, thus promoting gastronomic tourism development in Zemgale. However, last but not the least aspect is the demand in the market for this "green" product – consumers' trust and loyalty for such brand, which needs to be strategically enhanced by target-oriented marketing activities.

During the 1980s, with a growing understanding of social and environmental problems, the idea of green consumer emerged. Green consumers represented a potential market for any business that could identify those consumers who were particularly concerned about environmental issues, and who could be convinced to purchase products and brands that successfully differentiated themselves on social and environmental performance. (Belz F.M., Peattie K., 2013; Kotler P., Lee N.R., 2011).

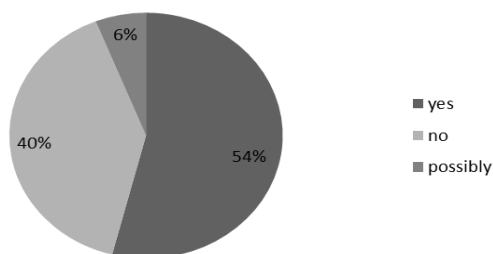
However, today the abundance of different product labels can easily bewilder an average shopper – "fast" or "convenience" food (takeaways, pre-prepared meals), "green" food, "clean" food (organic, preservative free, all-natural, free of genetic modification) and

"functional" food (having some beneficial effect beyond normal nutrition) often are supplemented by markings recognizable in domestic market – "Natural product", "Green spoon", "Latvian product" etc. Another problem is the complexity of product information, which is difficult to understand for an average shopper. Alongside with the progress of civilization, the daily life complexity increasingly becomes a burden, which makes it difficult and costly for routine events one of which is shopping (Leeb S., 2009). For the illustration of nowadays increasing life complexity, Leeb mentions the comparison: "The Pythagorean Theorem contains 24 words, the Lord's Prayer – 66 words but, e.g. the USA Government regulation on cabbage sales – 26 911 words." According to Storey, healthy and sustainable food choices will be made only in an environment where such food is accessible and affordable (Storey R., 2008). To help the consumer make the right choice in favour of one or the other product or service, it is important that consumers can distinguish them from each other. A brand is a name, a term, a symbol, or any other unique element of a product that identifies one firm's product(s) and sets it apart from the competition. Branding provides the recognition factor products need to succeed in regional, national, and international markets. When it comes to graphics for a brand symbol, name, or logo, the rule is that it must be recognizable and memorable. Moreover, it should have a visual impact (Solomon M. R., Marshall G.W., Stuart E.W., 2008). Brand identity basically consists of three elements: the brand name, logo and slogan or motto (Keller K.L., 1993; Kohli C. et al., 2007; Fayrene C.YL., Lee G.C., 2011; Kotler P., 2008). Consequently, the creation of a "green" product brand should start with appropriate building of its brand identity.

In the further study, the authors conducted a research to find out what qualities should be highlighted in the "green" product brand's image to distinguish sustainable food service providers

from the conventional or traditional food service providers. To find out the public opinion on the "green" product brand creation in Zemgale for promotion of catering services, the authors conducted a population survey. In the random sample survey, 124 residents of Zemgale biggest cities (Jelgava, Jekabpils, Bauska, Dobele) as well as of smaller towns and rural areas participated. Of all survey respondents, the majority or 78 % (97 respondents) were women and 22 % (27 respondents) - men. The average age of the respondents was 35.8 years.

The questionnaire consisted of 12 questions. Firstly, respondents had to rate their opinion on their daily eating habits within a 5-point scale (1-unhealthy; 5-very healthy), in which they most often had rated their daily eating habits with 3 points. However, 88 % (109 respondents) of the respondents expressed a desire to eat healthier. Consequently, people are aware that on a daily basis it would be necessary to choose healthier foods. On the question "What is your association with organic food?" 28 % (81 respondents) noted that it is of better quality, 24 % (70 respondents) said that it is more expensive, and only 3 % (9 respondents) claimed that it does not differ from ordinary food. The respondents' answers reveal that organic food quality perception of consumers is more important than its price, although the difference is not large, and both of these criteria are equally important for this kind of food choices.

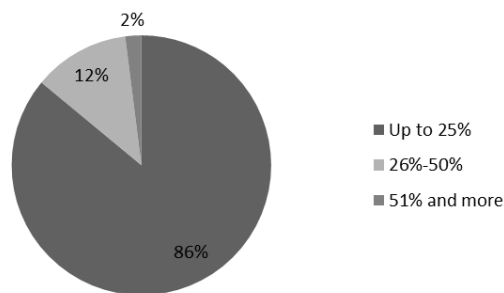


Source: author's calculations based on the survey data, 2016

Fig. 2. Respondents' views on the preference of catering services that use certified organic and locally sourced food

Regarding the choice of catering service provider, the majority of respondents, or 54 % would prefer catering services that use organically certified food products. However, a large proportion of respondents (40 %) answered that they would most probably select organic food catering services, yet they were not convinced of it.

Negative answers to this question were given only by 6 % of respondents. In response to the question of whether respondents would be willing to pay extra for a meal prepared from organic products, the answers were ambiguous - the majority or 46 % would be willing to pay extra; 21 % - would not be willing to pay extra; and 33 % did not have a clear answer.



Source: author's calculations based on the survey data, 2016

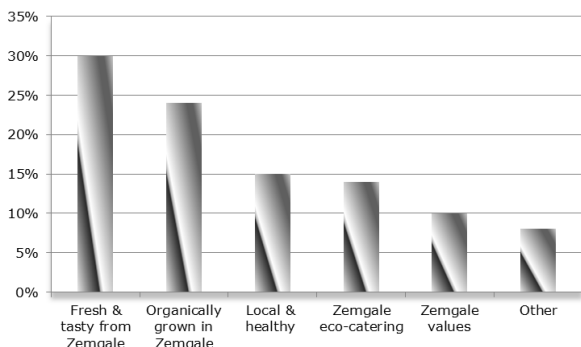
Fig. 3. Respondents' readiness to pay extra for a meal prepared from organic products

Specifying the respondents' willingness to pay extra for a meal prepared from organic products, the majority or 86 % claimed readiness to pay extra up to 25 % of a standard meal prices, but proportion of respondents who would be willing to pay extra more than 25 % for conventional food meal was 14 %. According to the results, it is clear that a meal of organic products in Zemgale should not cost more than 25 %.

The most often respondents' association with healthy meals related to naturalness - 24 %; quality - 24 %; and purity - 11 %. Besides the already given answers, respondents mentioned healthiness, ease, simplicity etc. answers.

The main reasons why respondents buy organic food is to improve the health and well-being - 17 %; to adopt healthy lifestyles - 13 % ;

and to support local entrepreneurs - 13 %. To sum it up, the most important aspects for the respondents are health and a healthy lifestyle; however, important factor is also the support to local businesses, which shows that the respondents are quite patriotic. The least significant factor was protection of the environment, which was supported only by 7 % of the respondents.



Source: author's calculations based on the survey data, 2016

Fig. 4. Respondents' suggestions for the most appropriate brand name for promotion of healthy food catering services in Zemgale, %

In respondents' opinion, the best formulations for a "green" product brand name could be "Fresh & tasty from Zemgale" - 30 % and "Organically grown in Zemgale" - 24 %. Alongside with the authors' suggested brand names (Figure 4), the respondents also mentioned "Zemgale Bio", "Bioteka", "Biotasty", "Natural from Zemgale" and "The taste of Zemgale nature". The suggested brand names give evidence that for the respondents local origin food is very important since in the majority of brand name ideas the word "Zemgale" dominated together with adjectives "fresh", "tasty" and "organic". Asked about the colour or colours with which the respondents associate healthy food logo, in most cases (62 %) the respondents associate it with traditional colour of eco products - green; 14 % - with white and 13 % with yellow 13 %. All the respondents suggested avoiding of black, purple and grey colours mentioning them as inappropriate for the given brand image. Regarding the symbols that the brand image could contain, for most

respondents (62 %) healthy food service providers associate with vegetable symbols (leaves, grass, cereals, flowers etc.) while 19 % of the respondents suggested to use the symbols of nature (forests, fields, sky, rivers etc.). Several respondents thought that a "green" product brand image should reflect a human's interaction with nature.

Finally, the last question was an open question - the respondents gave their proposals on what could be the most appropriate message or slogan to describe the "green" brand a healthy catering services. There were a number of options suggested, of which the authors chose the ones with similar ideas.

- "Delicious and clean, free of chemicals!"
- "Zemgale eat green!"
- "Delicious and healthy=beautiful and happy!"
- "Gentle nature - safe for food!"
- "Eat green, live green!"
- "To your health, Zemgalietis!"
- "Healthy meals from Latvian plains."

The authors also conducted slogan analysis, which showed most frequent words in the messages of the respondents. The most commonly used words such were "fit" and "healthy" (47 times); words associated with food and eating (44 times) the words associated with "green"; (32 times), the word "Zemgale", (26 times); the words "live", "life", "alive" (18 times) and the words related to "organic" (7 times).

The next part of the research employed in-depth interviews with seven experts who are either marketing area professionals or are involved in public catering business (as owners of cafes/restaurants and/or their employees) and local food producers in Zemgale region who run their business according to sustainability principles. After extensive discussions with the experts, the authors concluded that in fact there were two different approaches, thus the "green" product brand developers should consider which of the two slightly different positioning strategies could be more appropriate.

According to the first strategy, this brand identity, the symbolic meaning tells about simplicity, naturalness, modernity, possibly by using the symbol of green apple and green leaves symbolizing fertility, purity, and health.

Whereas according to the second strategy, brand image would emphasize the belonging to a particular place or region, and would indicate where the products came from. This brand name would manifest: "Grew up in Zemgale!" and would carry the idea of a sustainable life-cycle within the eternity and infinity.

Nevertheless, the authors would like to emphasize that the establishment of a "green" product brand's positioning strategies due to the limitations of the paper volume are currently offered as a rough forerun and general drafting how this brand might look like and what aspects of its image could be further elaborated by brand developers. For further studies, it would be advisable to clarify and develop this "green" product brand idea by involving more marketing specialists and experts as well as potential partners interested in collaboration.

Conclusions, proposals, recommendations

- 1) Since "Sustainable Development Strategy of Latvia until 2030" and "Zemgale Planning Region Sustainable Development Strategy 2015-2030" intend to develop a "green" country and a "green" region image, the establishment of a "green" product brand for sustainable catering services in Zemgale and its further branding strategy is topical.
- 2) The survey of Zemgale population revealed that 55 % of respondents would choose local sustainable caterers that use organically certified and locally sourced food products, and 86 % of respondents would be willing to pay extra 25 % for a meal made from organic products, which strongly justify the idea of developing a "green" product catering services' brand in Zemgale.

- 3) The survey results show that Zemgale respondents are quite patriotic, proud of their place of residence and local origin food is very important to them. Consequently, the majority of the suggested brand names, slogans and brand image symbols were associated with the word "Zemgale". However, the most often suggested colours for the trademark were green, white and yellow colours, which do not fully comply with the colours dominated in Zemgale logo, which contains blue and white colour. In authors' opinion the influence of green, yellow and white colours could be connected with the strong influence of the Union of Greens and Farmers, which is an agrarian political alliance in Latvia with particularly strong position in Zemgale region.
- 4) After the in-depth interviews with seven experts, the authors summarized that the "green" product brand for sustainable catering services in Zemgale could on the one hand carry the ideas of simplicity, naturalness, modernity, but on the other hand - sustainable life cycle within the eternity and infinity. The positioning approach should be clarified in further feasibility studies of this "green" product brand idea by involving more specialists and experts as well as potential partners interested in collaboration.
- 5) In authors' opinion, the most serious obstacles for the "green" product brand development in Zemgale would be its competition with the existing national significance quality brands such as "Zala karotite", "Latvijas ekoprodukts", "Vertigs products", which needs to be further assessed by the developers of this brand.

Bibliography

Journal paper with author(s)

1. Fayrene, C. Y. L., Lee G. C. (2011) Customer - Based Brand Equity: A Literature Review. In: Journal of Arts Science & Commerce. Vol. 2, Iss: 1., pp. 33 – 42.
2. Keller, K. L. (1993). Conceptualizing, Measuring, and Managing Customer – Based Brand Equity. In: Journal of Marketing, Vol. 57, No. 1, pp. 1-22.
3. Kohli, C., Leuthesser, L., Suri, R. (2007) Got Slogan? Guidelines for Creating Effective Slogans. In: Business Horizons. Kelley School of Business, Indiana University: Vol. 50, pp. 415 – 422.

Books

4. Belz, F.M., Peattie, K. (2013). Sustainability Marketing. Second Edition. Wiley.336 p.
5. Handbook of Research on Consumerism in Business and Marketing: Concepts and Practices. (2014). Editors: Hans-Ruediger Kaufmann and Mohammad Fateh Ali Khan Panni. IGI Global, pp. 155-181.
6. Jackson, T. (2005). Motivating Sustainable Consumption – A Review of Models of Consumer Behaviour and Behavioural Change. A Report to the Sustainable Development Research Network. London. p. 170.
7. Kotler, P.(2008). Principles of Marketing. London: Pearson Prentice Hall, 599 p.
8. Kotler, P., Lee, N.R. (2011) Social Marketing. Influencing Behaviours for Good. Fourth Edition. London: Sage Publications Ltd.
9. Leeb, S. (2009). Game Over. How You Can Prosper in a Shattered Economy (in Latvian). Riga: Zvaigzne ABC.
10. Solomon, M. R., Marshall, G.W., Stuart, E.W. (2008). Marketing: Real People, Real Choices. 5th ed. - New Jersey: Pearson Prentice Hall, 608 p.
11. Storey, R. (2008). Initiating Positive Behaviour, in J. Lannon (ed.). How Public Service Advertising Works. Henley on Thames: World Advertising Research Centre.

Internet sources

12. Dzene, S. (2013). Perspective of Sustainable Food Consumption in Latvia. Summary of Doctoral dissertation, Latvia University of Agriculture, Latvia. 132 p. Retrieved: http://llufb.llu.lv/dissertation-summary/food_economics/SkaidriteDzene_promoc_darba_kopsavilkums_2014_LLUESAF.pdf. Access: 30.12.2016.
13. European Commission (2008). Attitudes of European Citizens towards the Environment. Special Eurobarometer, p. 127. Retrieved: http://mail.inbox.lv/horde/imp/view.php?mailbox=INBOX&index=5665&array_index=3&id=4&actionID=view_attachment. Access: 30.12.2016.
14. Norwegian Ministry of the Environment (1994). Oslo Roundtable on Sustainable Production and Consumption Retrieved: <http://www.iisd.ca/consume/oslo004.html>. Access: 30.12.2016
15. Ricibas plans (2015). Zemgales planosanas regiona attistibas programma 2015 – 2020. Zemgales planosanas regions. p.42. Retrieved: http://www.zemgale.lv/index.php?option=com_docman&task=cat_view&gid=98&Itemid=1. Access: 30.12.2016.
16. Schenk, G. W. (2012). Slow Food Activities in Promotion of Organic Products. The presentation in the BERAS International Conference "Marketing and Investment in Organic Farming" in Jurmala, Latvia, 22 March 2012. Retrieved: <http://www.beras.eu/implementation/index.php/de/component/phocadownload/category/8-conference-presentations?download=114:riga-conference-2012-investments-and-marketing>. Access: 31.12.2016
17. Sustainable Development Strategy of Latvia until 2030 (2010). Retrieved: www.varam.gov.lv/in_site/tools/download.php?file...2030_en. Access: 30.12.2016.
18. Zemgale Planning Region Sustainable Development Strategy 2015-2030. (2015). Retrieved: ["http://www.zemgale.lv/index.php?option=com_docman&task=cat_view&gid=98&Itemid=1"](http://www.zemgale.lv/index.php?option=com_docman&task=cat_view&gid=98&Itemid=1). Access: 30.12.2016.

CUSTOMER RELATIONSHIP FORMATION AND MANAGEMENT IN RETAIL TRADE ENTERPRISES IN THE BALTIC COUNTRIES

Iveta Linina¹, Mg.oec.

Abstract. In modern market conditions, competitiveness assurance is very important for businesses. A consumer who is satisfied with the company's offer and loyal to it is the basis for its competitiveness assurance. Focus on consumers, their need awareness and satisfaction are factors for consumer-oriented approach in business management. Successful implementation of the processes is unimaginable without application of a consumer relationship management (CRM) system as it has become inherent to the business world, including the retail sector. The aim of the research is, via an expert survey, to approximate the level of CRM application in the retail companies of the Baltic States in order to gain understanding on the significance of the system.

Key words: customer satisfaction, loyalty, customer relationship management, retail.

JEL code: available on: M3

Introduction.

Despite the current overall growth rate in retail, the internal competition within the industry is increasing. One of the ways for a retail company to increase competitiveness is to introduce and develop continuously customer relationship management (CRM) as business is based on satisfaction of customer needs and desires, which provides it with profits. During the process different relationships form among the parties, but each of them has its own particular objective. For a company, it is primary to increase turnover, market share and profits, while for consumers they may differ – to acquire the needed goods/services at the required place and time, to obtain the necessary information and the desired service quality. The relationships are based on mutual benefit. The research shows that the acquisition of a new customer costs 5 to 10 times more than selling to the existing one, as well the existing customers spend by 67 % more than the new ones (Anderson et. al, 2007). Thus, it is vital for a retail company to develop a system that would promote customer desire for repeated purchase and sustained relationship. The research reviews the most popular principles of customer relationship management (CRM) application in retail. The elements of CRM system are not a finite process, but a mechanism for company improvement. In the modern business environment, there does not exist a unified customer management system that would ensure

business development and efficient use of the resources to ensure long-term competitiveness.

The present research aims to assess the level of consumer relationship management system application and the prospects of their development in retail companies as an efficient instrument for increasing competitiveness.

To reach the goal, the following tasks were established:

- 1) To research the theoretical basis of customer relationship management (CRM);
- 2) To describe the retail sector in the Baltic States and the existing preconditions for CRM development;
- 3) To establish the level of CRM application and possibilities in the Baltic retail companies.

The research limitations: To establish the trends in the Baltic States and the requirements for improvement of customer relationship management, 9 experts in the field of Baltic State retail were surveyed. Due to the information necessary for implementation of customer relationship management in a company, the present research has the following limitations: the customer relationship management is researched mainly from methodological aspects and on the basis of retail sector experts' opinions. The research period is from September 1, 2010, to September 1, 2014.

The following research methods were applied: monographic or descriptive method, logically constructive method – for comparison of theoretical material with the empirical results;

¹ Iveta Linina Tel.: +371 26306922. E-mail address: iveta.linina@turiba.lv

SPSS was used to process the expert survey data to establish the level of CRM application in the Baltic State retail companies. The methodological basis of the research is the works and publications of foreign (Griffin G; Swift R; Harvey L. etc.) authors, providing insight in information on the trends in the field of customer relationship management and on novelties in customer relationship management.

Discussion and results

Nowadays, many specialists, researchers and managers have come to the conclusion that, in conditions of severe competition, one of the most significant factors for company success is customer satisfaction with the offer and their loyalty to the particular product, brand or company. It is the positive attitude and loyalty that form the basis for consumer capital formation. Nevertheless, to reach the desired customer satisfaction and loyalty, the company

has to manage the consumer relationship process.

The analysis of publications and other sources in the field of customer relationship management (*Reisheld, 2003; Evans, 2012; Butscger & Stephan, 2002; Kotler & Keller, 2006; Toedt, 2015; Harker, 1999; Best, 2005* etc.) shows that there should be highlighted four retail sector-related systems researched in the theory and applied in the practice:

- 1) *Loyalty Programme* – LP
- 2) *Consumer Relationship Management* – CRM
- 3) *Efficient Consumer Response* – ECR
- 4) *Relationship Marketing Management* – RMM

Retail companies apply in practice a variety of management systems, but during the process of evolution each new system includes both established elements of the previous systems and new elements. The process is depicted in Figure 1.

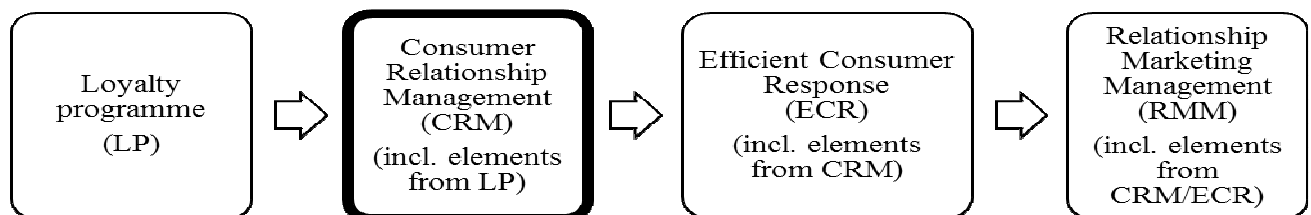


Figure 1. **Evolution of consumer management systems in retail**

Using LP, a company can collect wide-scale information about consumers in outlets and websites via research and direct communication, but this information is generally dispersed between the departments, service divisions and employees that have their own databases, plans etc. This hinders its coordination and consumer relationship management as a whole. To overcome the problem, companies have developed CRM system that allows systematization and effective use of consumer information.

The scientific literature holds a number of CRM explanations and definitions. This can be explained by two reasons. Firstly, the emergence of new marketing tools and technologies changes the functions of CRM and provides for new

opportunities in the field of consumer research and their relationship management. Secondly, the analysis of CRM formation and application is carried out from the perspective of different fields – marketing and sales, information technology, law, which undoubtedly influences the understanding of the system.

The analysis of the information of the CRM theory and practice from the marketing perspective (Curry, 2000; Evans, 2012; Kotler & Keller, 2006; McCorkell, 1997; Smith & Zook, 2011; Tapp, 2011; Harvey, 2015) shows that, for example P.Kotler and K.L.Keller believe that CRM is 'the use of detailed information on each consumer and the management of the contact of each consumer with the product, brand or company' (Kotler & Keller, 2006) while P.R.Smith

and Z.Zook stress that CRM is 'a complex company activity that includes formation and maintenance of a database that would help retain consumers by using their needs, complaints, suggestions and purchases' (Smith & Zook, 2011). L.Harvey believes that CRM combines two systems: internal (consumer research process) and external (consumer relationship formation) that are interconnected with the purpose to attain and retain consumers by offering a product or brand that corresponds to their needs (Harvey, 2015). Analysis-worthy is the opinion that 'CRM is not only technology, thus, it is not possible to increase the quality of consumer relationships with just the help of computer programmes. CRM is part of the company strategy for interaction with consumers' (Kraus, 2002). Quire often the definition of CRM is not essentially different from that of LP. For example, *O. Reilijs* and *D. Gibass* state that CRM is based on assembling company internal operation (research on consumer needs and expenses) to form external relationships with consumers (communication, purchase process) (Reilijs & Gibass, 2000). In this definition, the authors do not include the role of marketing data bases and new information technologies in the CRM process, nor do they stress the need for strategic approach to the system. On the basis of summary of the information available in the corresponding publications and websites, the following CRM definition is proposed: Consumer relationship management (CRM) is the business operation strategy to attract, differentiate, serve and retain consumers through understanding and satisfaction of their needs, to develop long-term cooperation based on the formation and maintenance of consumer database.

Contrary to the common use of LP, CRM requires the management of not only sales/purchase, but also pre-purchase and after-sales processes. Another significant difference is connected with the formation and use of marketing database (MDB) based on the new information technologies. Thus, using all positive

LP elements, market and consumer research has a large role in CRM system.

Summarizing the publications on CRM, company reports and CRM-related conference proceedings (Kotler & Keller, 2006; McCorkell, 1997; Smith & Zook, 2011; Tapp, 2011; Mathony, 2002) the following main principles of CRM operation are highlighted:

- building consumer marketing database (MDB);
- consumer differentiation by 2 criteria: needs and benefit for company;
- attraction of new consumers and retention of the existing ones by stimulating repeated purchase and relationship building;
- consumer relationship formation and management to ensure the decrease in average expenses per consumer and the increase in profits based on the increase in loyalty levels;
- optimization of pre-purchase and after-sales process from the perspective of both consumers and the company.

To ensure the functioning of CRM, the following resources are required (Smith & Zook, 2011):

- qualified company staff (managers, specialists);
- modern IT, including the necessary technology, programs and means of communication;
- financial means to ensure personnel motivation and for IT purchase when it is not rented;
- time needed for particular stages and the process as a whole of CRM system implementation

The main component of CRM system and at the same time the main element of functioning of the process is the marketing database (MDB). Generally, the researchers and specialists agree on the concept and functions of MDB, there are only slight differences (De Pelsmacker, et. al., 2007). Particularizing the definition of MDB, which is closely related with CRM planning and

implementation, it would be as follows:
Marketing database (MDB) is a complex of interrelated data on the existing and potential consumers and companies on the market for information gathering, processing and analysis with the purpose of consumer attraction, retention and sustention.

Of course, it is important not only to create MDB and fill it with information, but also to use it rationally, as the effectiveness of the CRM system depends on its use.

It would be incorrect to link the nature of CRM only with computer software that mainly has

control function (Krauss, 2002). Such approach is criticized by other experts and researchers too. One of experts has noted: 'CRM is not a technology. You will not increase the quality of consumer relationships, but only enter a modern CRM program into your computer. CRM is a part of strategy for interaction with consumers' (Eskildsen & Kristensen, 2007). Joining the researchers who relate CRM primarily with marketing and management (Krauss, 2002; Reilijis & Gibass, 2000; De Pelsmacker, et.al., 2007; Anderson, 2007 etc.), the authors offer a five-stage CRM building scheme (see Figure 2).

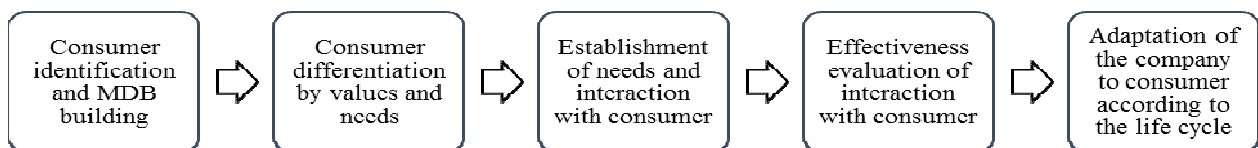


Figure 2. **Consumer relationship management stages in a company**

In essence, the CRM scheme (see Figure 2) complies with the requirements of retail companies, of course, taking into account the specifics of the industry. The analysis of the publications on the use of CRM in retail (Anderson, et. al., 2007; Curre, 2000; Griffin, 2002; Kim, et. al., 2004; Swift, 2000) shows that the formation of CRM system in retail should consider the following particularities:

- For long-term system operation, there should be ensured close functional cooperation between marketing and sales departments/services of a company.
- The formation, maintenance and improvement of MDB should be based on the client card, the planning, formation and distribution of which should be substantiated and purposeful.
- One of the important CRM objectives is high-level quality assurance in outlets, incl. introduction and maintenance of product category management (distribution of products on shelves and in catalogues in accordance with consumer needs).
- In case of not renting, the introduction and maintenance of MDB in retail requires larger

investment than in other industries, particularly in computer equipment, computer communication, computer programs, training and preparation of staff.

- It should be taken into account that not all consumers, who want to acquire products in the particular outlet, are loyal and agree to provide detailed information about themselves, nor let a company to use other databases with their personal data.

Since regaining independence, retail in Latvia in particular and the Baltic States in general has developed with changing effects. For many years the sector has been one of the largest contributors to GDP. During the global economic crisis, retail was one of the economic sectors to experience the largest downturn. Since 2011, retail has developed similar to the economy as a whole. While retail is generally influenced by internal events, it is also indirectly affected by external factors. The Russian-Ukrainian conflict and the related sanctions, as well as the weak growth within the European Union (EU) leave negative impact on consumer behaviour and

stimulate savings, thus hindering the total consumption.

To gain understanding on the situation in the Baltic State retail sector, there was analysed the

shadow economy index (SEI), which provides the best description of the industry situation (see Figure 3).

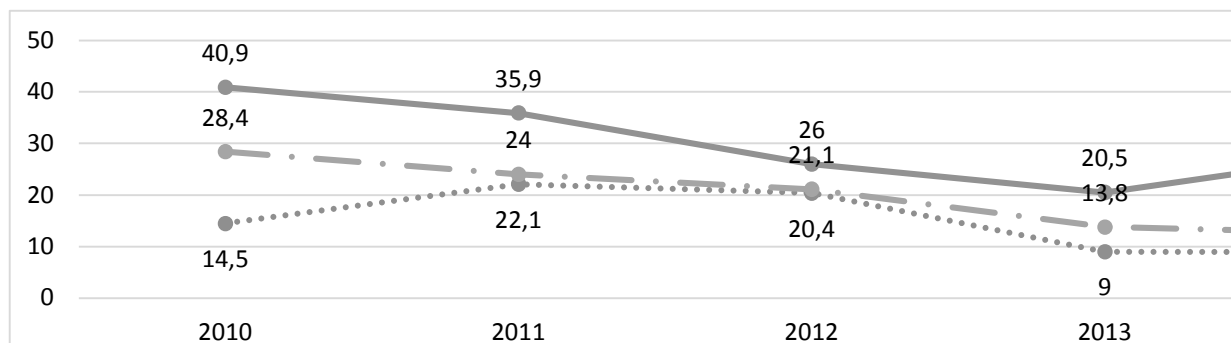


Figure 3 **Shadow economy in the Baltic State retail sector 2010 – 2014 (% of GDP)**
(According to the data by Putnins, Sauka, 2015)

As seen in Figure 3, Latvia is the leader among the Baltic States regarding the shadow economy in the retail sector. While there was a positive trend from 2010 to 2013 with SEI decreasing by 20.4 percentage points, the indicator increased by 8.1 percentage points in 2014. It should be noted that the index was only 12.4 % in Estonian retail sector in 2014. As well, for Estonia and Lithuania the index shows constant decrease trend. This means that companies can reach their goals applying legal and transparent business methods, incl. in the field of consumer relationship management.

For the evaluation of how entrepreneurs use consumer relationship management principles in the retail companies in the Baltic States, it is vital to understand the current level and future prospects of CRM application. For this purpose, an expert survey was carried out. Taking into account the experts' knowledge level and connection to the relevant questions, 9 experts were selected – the leading specialists of the trade associations of the Baltic States, who evaluated the situation in their country in general, as well as the representatives of the retail chains located in all three Baltic States, who evaluated the situation in their respective companies.

The expert survey questionnaire consists of 7 questions. The questions were designed with the

purpose of evaluation of the level of CRM application in the retail companies of the three Baltic States by seven criteria. The expert survey result processing and analysis is shown in Table 1. As it can be seen, the lowest evaluation ($\bar{x}=3.78$; $Me=3.0$; $Mo=1.00$) was given to 'product assortment formation on the basis of CRM data'. It is a very bad result as consumer satisfaction and loyalty to retail companies largely depends on product assortment. The table data also indicate that the retail companies insufficiently use the CRM data processing and analysis ($\bar{x}=4.33$; $Me=5.00$; $Mo=5.00$) and consumer loyalty program connection with CRM ($\bar{x}=4.44$; $Me=5.00$; $Mo=5.00$). This lacks explanation as, according to the theory, loyalty programme is the basis for CRM formation.

In general, it should be noted that evaluation variations have a wide range (see Table 1). As well, a clear trend can be observed – the lower is the average arithmetic indicator (\bar{x}), the larger is the range of variation. For example, the criterion 'use of CRM data for product assortment formation' is valued with 7.89, 'client segmentation in the database' – 6.96, etc. This means that the expert evaluations vary for different retail companies. In the conditions of competition, companies are not willing to share their experience in the field of CRM formation and

application. Nevertheless, from the perspective of strategic development, the dissemination of experience would be desirable as it would promote the company image among consumers, benefiting both those who share their experience and those who use it. The positive aspect of research results is that the higher values were

awarded in relation to the questions on the application of CRM and the improvement of the software within the next 5 years. This indicates the understanding of the significance of the system in the business development based on legal methods.

Table 1

Main indicators of the expert evaluation of the level of CRM application in retail companies or companies in general in the *Baltic States*

| Level of CRM application | Arithmetic mean | Standard deviation of arithmetic mean | Median | Mode | Average square deviation | Dispersion | Range of variation | Max evaluation | Sum |
|--|-----------------|---------------------------------------|--------|------|--------------------------|------------|--------------------|----------------|-------|
| Level of use of CRM possibilities | 5.22 | 0.80 | 6.00 | 2.00 | 2.39 | 5.69 | 5.08 | 8.00 | 47.00 |
| Consumer loyalty programme connection with CRM | 4.44 | 0.75 | 5.00 | 5.00 | 2.24 | 5.03 | 5.61 | 7.00 | 40.00 |
| Level of CRM data processing and analysis | 4.33 | 0.75 | 5.00 | 5.00 | 2.24 | 5.00 | 5.73 | 7.00 | 39.00 |
| Consumer segmentation in CRM database | 4.78 | 1.00 | 5.00 | 1.00 | 2.99 | 8.94 | 6.96 | 9.00 | 43.00 |
| Use of CRM data in product assortment formation | 3.78 | 0.89 | 3.00 | 1.00 | 2.68 | 7.19 | 7.89 | 8.00 | 34.00 |
| Probability of improvement measures for CRM software within the next 5 years | 6.78 | 0.83 | 8.00 | 8.00 | 2.49 | 6.19 | 4.08 | 10.00 | 61.00 |
| Probability of improvement measures for CRM application in the company within the next 5 years | 7.22 | 0.85 | 8.00 | 9.00 | 2.54 | 6.44 | 3.91 | 10.00 | 65.00 |

Discussion and results

- 1) To acquire new consumers, the company requires more resources, time and energy, than to retain the existing ones. Consumer relationship management (CRM) system is an instrument that a company can use to gather and process information on its consumers to understand their needs and to form long-term relationships that would increase their satisfaction and loyalty.
- 2) Since regaining independence, the retail sector in the Baltic States has developed similarly to the economy as whole. Regarding the shadow economy index (SEI), the leader

in the Baltic State retail in Latvia (28.5 % in 2014). In 2014, in the retail sector in Estonia the index was only 12.4 %, and in Lithuania – 8.9 %. As well, in Estonia and Lithuania the SEI indicator shows a constant decrease trend. This means that companies can reach their objectives by using legal and transparent business methods, incl. in the field of consumer relationship management.

- 3) The expert survey shows that the level of CRM application in the Baltic State companies is insufficient from the perspective of consumer need satisfaction and loyalty formation, thus the system needs improvement and development taking into account the

particularities of the target groups and other factors in accordance with the information obtainable from MDB.

- 4) Retailers in the Baltic States have become aware of the benefits of CRM system application and are ready to invest effort and means for the improvement of the system. The use of CRM databases for consumer

analysis and segmentation may be the main pre-condition for formation of consumer satisfaction and loyalty, as well as for competitiveness assurance in the retail sector.

- 5) In Latvia, there has not been carried out in-depth research on CRM benefits and application that would convince retail businesses to make better use of it.

Bibliography

Journal paper with authors

1. Anderson, Joan L.; Jolly, Laura D.; Fairhurst, Ann E. (2007) Customer relationship management in retailing: A content analysis of retail trade journals, *Journal of Retailing and consumer services* 14, no.6.
2. Category Management by Nielsen Marketing Reserch. McGraw-Hill Trade, (1993).
3. Corkell, G.Mc. (1997). *Direct and Database marketing*. Kogan Page, London.
4. Curry, J. (2000). *The customer marketing Method: How to implement and Profit from Customer Relationship Management*. New York.
5. Best, R. (2005). *Market based management*. 4th ed., Prentice Hall.
6. Butcher, S., Stephan, A. (2002). *Customer Clubs on Loyalty Programms*. Abingdon, Oxsn, GBR: Gower Publishing Limited.
7. Griffin G., (2002), *Customer Loyalty: How to Earn It How to Keep It*, p.18.
8. Evans, M. (2012). *Consumer Behavior*. Hoboken, NJ, Willy.
9. Kim, J.W., Chi, J., Qualls, W., Park, J. (2004). The import of CRM on firm and relationship lever performance in distribution networks. *Communication of the Association for informations Systems*.
10. Krauss, M. (2002). At many firms, technology obscures CRM. *Marketing News*, 2002, 18 March.
11. Putniņš, T.J. & Sauka A., (2015). Ēnu ekonomikas indekss Baltijas valstīs 2009 – 2014. Rīga: SSE Riga Ilgtspējīga biznesa centrs, 47 lpp.
12. Reisheld, F. (2003). *The One Number You Need to grow* – *Horvard Business Review*, decembris.
13. Swift, Ronald S. (2000) *Accelerating Customer Relationships: Using CRM and Relationship Tehnologies*, Dallas.
14. Tapp, A. (2001). *Principles of Direct and Database Marketing*. 2nd ed. Prentice Hall, Englewood Cliffs, NJ.
15. Toedt, M. (2015). *The contribution of customer relationship management to sales performance in the hotel business*. Summary of Doctoral Thesis, University of Latvia, Rīga.

Books

16. Eskildsen, J. K. & Kristensen, K. (2007). Customer satisfaction: The role of transparency. In: *Total Quality Management & Business Excellence*, Print Edition. 18, 1-2, p. 39-47, 10 p.
17. De Pelsmacker, P., Genens, M., Van den Bergh, J. (2007). *Marketing Communication*, 3rd ed., Prentice Hall, pp.397-407.
18. Harker, M.J. (1999). *Relationship Marketing defined*. MCB University Press, Bradford, p.13-20.
19. Kotler, P., Keller, K.L. (2006). *Marketing anagement*. 12th. ed., Prentice Hall, p.196-197.
20. O`Reiljs, D., Gibass, Dž. (2000) *Darījumu attiecības ar pircējiem*, Rīga.
21. Smith, P.R., Zook, Z. (2011). *Marketing Communication*. 5th.ed. Kogan Page, PA, p.61-86.

Internet sources

22. Harvey, L. (2015). *How to provide customer intelligence*. Retrieved: 03/08.2015. <http://paperzz.com>

THE ANALYSIS OF ECOLOGICAL CULTURE AND BEHAVIOUR OF STUDENTS AND EMPLOYEES IN RUSSIAN UNIVERSITY

Anastasia Lukina¹, PhD/ Associate Professor; Daria Malova², PhD and Vasily Kuznetsov³

^{1, 2, 3}Plekhanov Russian University of Economics

Abstract. Education should play an important role in sustainable development all over the world. However, at present, education often contributes to unsustainable living and the reason for it is low ecological culture of students and employees of institutions. The paper outlines problems in the area of ecological culture and behaviour of students and employees in Russian University. The survey was carried out using questionnaire. There were both open questions and multiple choice questions. The article presents the main results of the survey. Data analysis shows that the general level of ecologic culture of students and employees is not very high but the most of them are ready to support the ecological activities of the university. The students under 22 were the least conscious in issues of ecologic culture and ecologic behaviour. The majority of respondents point out that social advertising, visual aids and other means of educating in this field could enhance ecologic culture and motivate people to demonstrate better ecologic behaviour.

Key words: sustainable development, education in sustainable development, research of ecological culture, research of ecological behaviour

JEL code: M310, Q56, I310

Introduction

Issues of sustainable development in the Russian Federation are especially acute today. Subject to Strategy 2020, Russia sets the goal of attaining the trajectory of sustainable development and well-balanced growth to pass over to innovation stage of economic development and to build infrastructure adequate to post-industrial society (Strategy 2020: New..., 2011).

It is obvious that the attempt to catch up with developed countries and to enhance well-being of the population by intensive industrialization and ignoring ecological standards could cause sharp deterioration of ecological situation, especially in metropolises and industrial centres. Therefore, it is essential to find new ways, which could allow the country to develop its social and economic system on the basis of sustainable development principles. In early 2016, V.V. Putin, the President of the Russian Federation signed the edict concerning declaration of 2017 the Year of Ecology in the Russian Federation (Presidential Decree dated..., 2016), which would attract public attention to ecologic development in the Russian Federation and guarantees of ecologic security of the country. In view of these tasks, education institutions face the objective of supporting and fostering to the development of

strategy aiming at sustainable development of the country.

Apart from that, education institutions would be provided with an opportunity to improve their status and the status of education in general as a civilization institution, a chance to demonstrate their potential in the field of shaping ecological culture, which in its turn could ensure sustainable development and sustainable growth of society as a whole.

It should be mentioned that the initial point of ecologic education and the basis of university sustainable development was the concept formulated in 1987 in the report of the UN World Commission on the environment and development "Our Common Future", which is known as Bruntland Report (Our Common Future..., 1987). This concept identifies key ways of overcoming ecological and social problems accompanying economic growth. Later the World Conference on Environment and Development in Rio de Janeiro adopted strategy of sustainable development as a global strategy (1992) and education was assigned one of the principle parts within the frame of this strategy.

Thus, we can say that first research and investigations in the field of sustainable development and identifying the role of education and education institutions in this process came

into being nearly three decades ago but this work is still far from its end.

In 1990, we got first findings on mechanisms, which can provide universities' transition to principles of sustainable development. It took place at the International Conference in Talloires, France, where a project group of 31 universities from 15 countries adopted the Declaration known as Talloires (Talloires Declaration, 1990).

University Rectors confirmed their adherence to principles of sustainable development in higher education and outlined an action plan. So far, more than 400 universities from different countries have signed the Declaration. The action plan consists of 10 items (Association of University..., 1990).

In 2009, Bonn hosted the UNESCO World Conference on Education Aimed at Sustainable Development, which secured the status of education as a decisive factor in shaping sustainable development in society (Bonn Declaration, 2009).

In 2016, the 8th Conference of Ministers "The Environment for Europe" took place in Batumi, Georgia, which worked out the Draft Batumi declaration of ministers on education aimed at sustainable development (Learning for the..., 2016). It pointed out that it was necessary to improve cooperation in the field of environment protection, transition to "green economy" and support of sustainable development. It was also underlined that by 2030 all students should get knowledge and skills needed to foster sustainable development. The Declaration puts forward the idea to include education aimed at sustainable development in pedagogical education and training of all teachers and lecturers. It focuses on network collaboration between education institutions and bodies of local government, civil society, academic and scientific quarters, non-government organizations, business structures and enterprises, which would provide an opportunity to efficiently implement education

aimed at sustainable development (Learning for the..., 2016).

However, today in contrast to the concept of sustainable development, which was officially recognized, the theoretically substantiated ideas, principles and mechanisms of sustainable development of university and strategies of its transition to "green" university have not been developed well enough.

We think that the concept of sustainable development should be adapted for education institutions, which could enhance efficiency of its interactions with economic, ecologic and social environmental factors in the process of its functioning. Understanding the role and contribution of university to sustainable development in the country, on the one hand, could allow the university work effectively, but on the other hand, could create competitive advantages to form the image of the "green" university to cut costs on key sources of environment pollution.

However, to design strategy of "green" university, it is necessary, first of all, to assess the level of ecological culture of students and employees of the institution as it is university students and employees, who would transmit ecological initiatives of the university and would shape and support its "green" image. At the same time, it is essential to estimate their readiness to stick to ecological behaviour, which would allow university to decrease environment contamination through cutting water and electricity consumption (expenses on lightning) and passing over to separate collection of wastes etc.

In view of all these factors, the goal of the present sociological research was to survey students and employees and to collect empiric data concerning the level of their ecologic culture and ecologic behaviour.

The key target of the article is to describe findings of the research, which in line with other investigations of the authors have built the

foundation for designing the road card of university transition to principles of "green" institution.

The research was carried out in several stages. At the 1-st stage, the questionnaire was worked out, which consisted of three blocks: the introduction with greetings, the body and the classification part (passport block). The introduction consists of greetings and an appeal to the respondent, it explains the aim of the survey, motivates to giving honest answers to questions and explains rules of questionnaire filling in. Questions of the body aimed at disclosing information and estimating indicators necessary to resolve the set tasks. There were both open questions and multiple choice questions with one open variant of the answer (for example, "Other"_____). Apart from that in order to conduct statistical analysis and to develop ratings measuring technologies of sociological research, i.e. scales (interval, nominal, rating) were used. The passport block included questions, which later would help carry out the comparative analysis by social and demographic parameters of respondents.

The research questions included the following:

- assessment of the general impression and respondents' attitude to litter in classrooms (papers, food packing, water bottles left in classrooms);
- the degree of respondent's agreement with the statement "I can leave in the classroom litter (bottles, papers, packing)". By this question we could find out the respondent's ecological behaviour. On the basis of these answers, we could assess:
- the share of respondents demonstrating different ecologic behaviour and explanations given by respondents about their behaviour;
- social and demographic characteristics of respondents demonstrating different models of behaviour in respect of litter left in the classroom;

- comparison of behaviour model with social and demographic profile of respondent;
- correlation between the attitude to litter in classrooms and readiness not to allow others to dirty classrooms with litter, readiness to separate collection of waste;
- attitude of respondents to separate collection of waste, including social and demographic characteristics of respondents and their readiness to change their behaviour in respect of waste collection;
- models of ecologic behaviour and prospects for using ecologic navigation as a step aimed at decreasing the number of cases of leaving litter in classrooms and public places;
- respondents' attitude to non-switching off light in classrooms;
- ecologic behaviour of respondent in question concerning "switching off light in classrooms";
- explanation of respondents dealing with the phenomenon (the light being left switched on in classrooms) and explanations of the respondent's behaviour. As the question was connected with a delicate subject, it was reasonable to ask an indirect question in order to reduce the degree of refusal to answer and the degree of answer distortion. In the following analysis of respondents' answers, we could make a comparative assessment of the respondent's behaviour, his/her evaluation of causes of the problem of non-switched off light in classrooms, general perception by the respondent of the problem, estimation of prospects of the problem solution with the help of ecologic navigation and social advertising;
- respondents' attitude to the efficiency of posters and social advertising to solve the problems (litter in classrooms, non-switched off light in classrooms).

Respondents also could suggest their measures to reduce cases of leaving litter and switched on light in classrooms.

The questionnaire consists of 18 questions (taking into account the block of information about the respondent).

The information was collected by surveying target audiences. The questionnaire was placed at the principle page of the university official portal, informing was provided through university accounts in social networks, through students-activists and e-mailing to employees. The survey was conducted from 02.11.2016 to 21.11.2016. As a result we got 152 filled-in questionnaires.

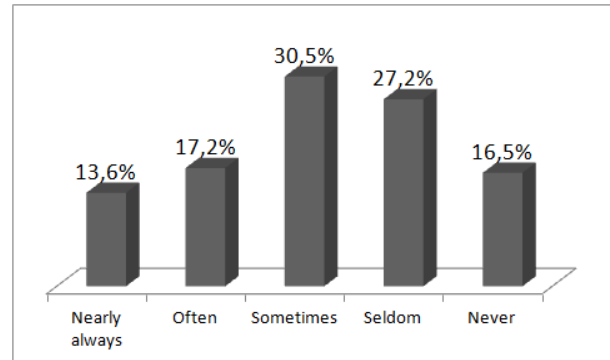
The 1st stage of the research also included certain procedures necessary to carry out the 2nd stage of the research. They include, for example shaping the structure, criteria of work and necessary material and technical resources for the team work centre (research headquarters); finding the quantity and structure of collaboration and roles in the project of collection and processing questionnaires.

The 2nd stage included: questioning, transforming the results of the survey in the e-form for further processing and analysis; processing of the information to get distribution of answers to questions; comparative analysis of answers to questions grouped by social and demographic criteria and other sections; preparation of conclusions and recommendations, based on analysis results.

The present research was done among students and employees of one institution and this does not allow us to extrapolate its results to other universities of the Russian Federation without additional research and preliminary adaptation and cannot be used to assess ecologic culture of Russian society in general. However, these findings can act as a starting point for similar research and can be used for comparative analysis in other investigations on this subject. At the same time, research conclusions can be helpful for universities designing strategies of sustainable development.

Research results and discussion

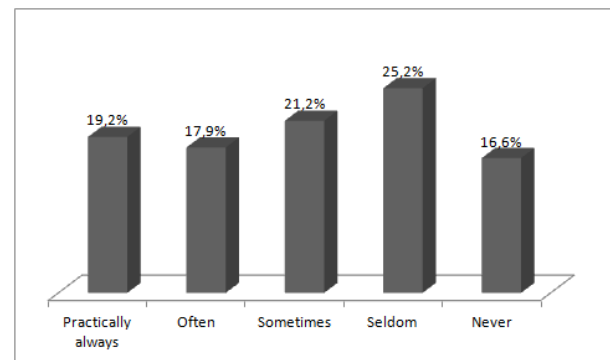
According to results of the survey, about 30 % of students and employees mention that they can often see litter (plastic bottles, papers, food packing) in classrooms (Fig. 1).



Source: author's calculations based on the results of survey

Fig. 1. Opinion of respondents about litter in classrooms

At the same time, 37 % of respondents pointed out that they often see switched on light in empty classrooms. The results are shown in Fig. 2.

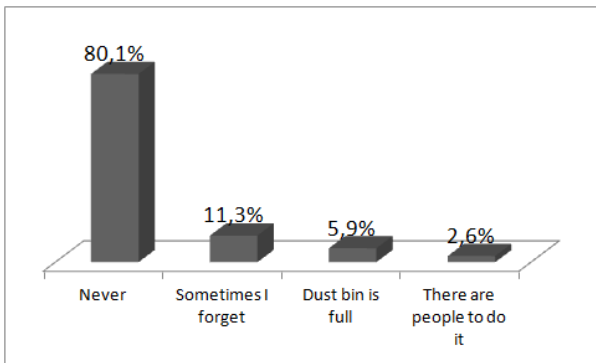


Source: author's calculations based on the results of survey

Fig. 2. Distribution of respondents' answers to the question "I see switched on light in classrooms every day"

According to the survey, 80 % of respondents say that they never leave litter (Fig. 3), 11.3 % say that sometimes they forget to take away litter, 5.9 % explain that they do not remove litter as the dust bin is full and 2.6 % think that there are people who are supposed to do cleaning as it is their job.

However, 10 % of respondents who said that "they did not like litter in the classroom as they never do it" acknowledged that "sometimes they forget to take litter away".



Source: author's calculations based on the results of survey

Fig. 3. Respondents' answers to the statement "I can leave litter (plastic bottles, papers, food packing) in the classroom"

As for separate collection of waste, respondents' answers distributed in the following ways: 74.8 % of people are ready and support the idea; 11.9 % understand the importance of separate collection of waste but are not ready for such behaviour; 13.2 % think there is no reason to start separate collection of waste.

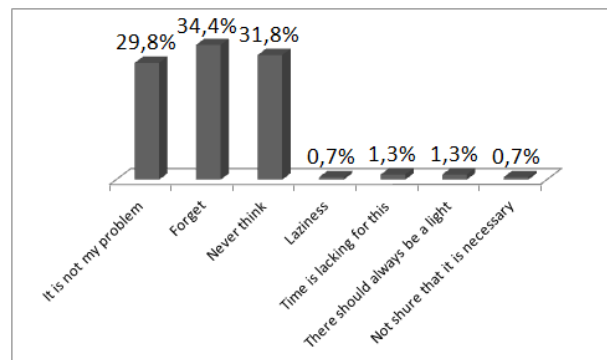
A half of respondents pointed out that they actually always switched off the light in case they were the last to get out of the classroom and never left litter there. More than a third of respondents said that they actually always switched off the light, if they were the last to get off the classroom and they never left litter there and at the same time they supported the idea of separate collection of waste.

Respondents under 22 were the most infantile: 13 % of them answered that "they did not take away litter as there were people who are supposed to do cleaning and it is their job"; other 13 % said that they did not remove litter as "the dust bin is full or it is not available" (for comparison we can mention that the frequency of such answers in general for respondents of all age groups was 2.6 % and 5.9 %, respectively).

A certain difference in ecologic consciousness can be observed in respect of gender: for example, 30 % of males wrote in questionnaires that the idea of separate collection of waste was not useful (while females gave the similar answer only in 7.3 % of cases). Higher ecologic

responsibility and activity of women was also confirmed in various international research. For example, research done in 15 different countries of the world by the research company "TGI Global" (Global TGI Barometer, 2005) showed that in Great Britain women were more interested in ecological problems than men and took more active position in issues of ecology and realizing ecology behaviour. In our early research (Lukina A., 2010), (Lukina A., Meshkov A., 2012), (Lukina A., Pohvoshev V., 2012) we also observed more active position of Russian women in issues of ecology and their readiness to demonstrate ecological behaviour.

As for possibilities of social advertising and ecologic prospects, 55 % of respondents agreed that they could help resolve the problem of ecologic behaviour (24 % answered "no" and 21 % of respondents found it difficult to answer).



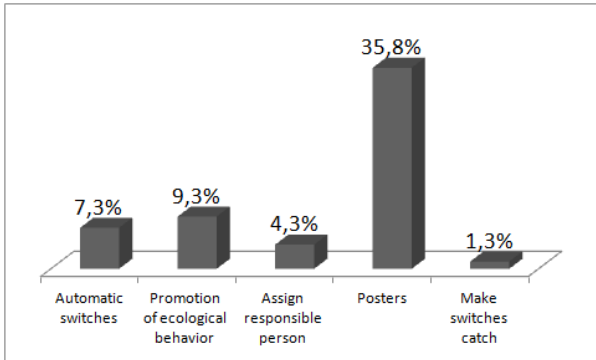
Source: author's calculations based on the results of survey

Fig. 4. Opinion of respondents about causes of non-switched off light in empty classrooms

At the same time, respondents say that they often leave the light switched on as "they do not know whether it is necessary to switch it off" (2 %), "never thought about it" (32 %), think that "it is not their problem" (30 %), or just forget about it (34.5 % - the most popular answer). The results are shown in Fig. 4. In this case, ecologic navigation and social advertising can change behaviour and attitude of students and employees and enhance their ecologic culture.

In case of the issue of non-switched off light in classrooms, respondents very often suggested

placing reminding posters (35.8 %), different ways of informing and educating (through monitors, lecturers, at meetings - 9.3 %) and fixing automatic switches and movement pickups (7.3 %). The results are given in Fig. 5.



Source: author's calculations based on the results of survey

Fig. 5. Respondents' opinion about measures which can resolve the problem of non-switched off light in empty classrooms

To resolve the problem of leaving litter in classrooms, respondents offer social advertising and various reminding posters (15.8 %), education talks (10.6 %), administrative impact, including fines (10 %), increasing the number and capacity of dust bins (13 %). Apart from that, there are suggestions concerning more evident dust bins or more creative dust bins to attract people's attention.

Conclusions, proposals, recommendations

- 1) Issues of sustainable development and transition of universities to strategy of "green" institution are extremely acute today. By analysing documents of the UN, the UNESCO, the UNEP adopted from 1972 to 2016 we can see that education was assigned a principle part in shaping "society of sustainable development" (Bonn Declaration, 2009).
- 2) In early 2016 V.V., Putin, the President of the Russian Federation signed the edict about declaring 2017 the Year of Ecology (Presidential Decree dated..., 2016), which would attract public attention to issues of ecological development of the Russian Federation and ensuring ecologic security of our country. In view of these tasks, Russian

education institutions, especially higher education institutions face a serious objective of adapting their strategies of development to new social-ecologic and economic conditions.

- 3) To implement strategy of sustainable development, universities should provide their students and employees with ecologic knowledge and to shape ecologic culture and it could give them an opportunity to act in the interests of sustainable development of the university itself and of Russian society in general.

- 4) The present research showed that:

- the general level of ecologic culture of students and employees is not high; many respondents do not think that it is necessary to switch off light in the classroom, they do not consider the idea of separate collection of waste and can leave litter in classrooms;
- about 75 % of respondents support the introduction of separate collection of waste in the university;
- among students' respondents under 22 are the least conscious in issues of ecologic culture and ecologic behaviour, which shows the important role of upbringing and educating functions of university in ecologic education;
- the majority of respondents point out that social advertising, visual aids and other means of educating in this field could enhance ecologic culture and motivate people to demonstrate better ecologic behaviour;
- gender differences in the level of ecologic culture and ecologic behaviour can be observed, so women are more active and more ecologically oriented;
- an unexpected fact was recorded that irresponsible ecologic behaviour, for instance non-switching off the light after getting out of the classroom, took place because respondents did not know whether they should switch the light off or it should be on in classrooms constantly; it points to the

necessity of educational and explanation work among students and employees;

- As measures, which could enhance ecologic culture and stimulate ecologic behaviour, respondents suggested: reminding posters,

explanation work, fixing pick-ups of automation light switching off, administrative impact through fines; creative decisions for dust bins, increasing their number.

Bibliography

Journal paper with author(s)

1. Lukina, A.V. (2010). The Ecological Factor in Consumer Perception. *Marketing*, № 3 (112), pp. 78-91.
2. Lukina, A.V., Meshkov, A.A. (2012). Possibility of Eco-Friendly Goods Price Differentiation. *Marketing and Marketing Research*, Special addition, pp.48-55.
3. Lukina, A.V., Pohvoshev, V.A. (2012). Forecasting the Impact of Environmental Factor on Consumers and Development of the Green Products Sector. *Collection of Academic Works of the Free Economic Society*, № 4, pp. 64-78.

Internet sources

4. Strategy 2020: New Model of Growth - New Social Policy. Interim Report on Results of Expert Work of Social and Economic Strategy of Russia for the Period up to 2020). (2011). Retrieved: <http://im.kommersant.ru/content/pics/doc/doc1753934.pdf>, Access: 11.11.2016
5. Our Common Future from the United Nations World Commission on Environment and Development (WCED). (1987). Retrieved: <http://www.un.org/ru/ga/pdf/brundtland.pdf>, Access: 15.11.2012.
6. The United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 3-14 June 1992). (1992). Retrieved: http://www.un.org/ru/documents/decl_conv/conventions/agenda21_ch4.shtml, Access: 23.11.2015 г.
7. Talloires Declaration. (1990) Retrieved: http://www.ulsf.org/programs_talloires.html, Access: 30.10.2016.
8. Association of University Leaders for a Sustainable Future. The Talloires Declaration. 10 Point Action Plan. (1990) Retrieved: <http://www.ulsf.org/pdf/TD.pdf>, Access: 30.10.2016.
9. Bonn Declaration. UNESCO World Conference on Education for Sustainable Development held in Bonn, Germany on 31 March to 2 April 2009). (2009). Retrieved: http://www.geogr.msu.ru/hesd/docs/bonn_declaration.pdf, Access: 12.11.2016
10. *Learning for the Future – Competences in Education for Sustainable Development. Eighth Environment for Europe Ministerial Conference "ENVIRONMENT FOR EUROPE"*. (2016). Retrieved: <http://www.unece.org/fileadmin/DAM/env/documents/2016/ece/ece.batumi.conf.2016.11.r.pdf>, Access: 13.11.2016
11. Global TGI Barometer. Green shoppers). (2005). Retrieved: <http://www.comcon-2.com/default.asp?artID=1112>, Access: 12.11.2012.
12. *Presidential Decree dated 05.01.2016, № 7 "2017 the Year of Ecology in the Russian Federation"*. (2016). Retrieved: <http://kremlin.ru/acts/bank/40400>, Access: 19.11.2016

FACTORS AFFECTING CONSUMER BUYING PROCESS OF ORGANIC FOOD IN KRAKOW URBAN AREA

Renata Matysik-Pejas¹, Dr. Ing.; **Monika Szafranska**², Dr. Ing. and **Elena Horska**³, prof. Dr. Ing.

^{1, 2}Agricultural University in Krakow, Poland; ³Slovak University of Agriculture in Nitra, Slovakia

Abstract. Societies, particularly in highly developed countries, become more and more interested in the environment protection issues showing their high ecological awareness. One of the most popular ways of its manifestations among consumers is the purchase of organic food. Recognition of purchase reasons of this kind of food is key element for producers. Identification and understanding of determinants of buying process provides a source of competitive advantage and helps to succeed on the market. The research aim was to examine selected motives and criteria as factors affecting organic food buying process depending on the length period of its purchasing by consumers. Survey was conducted from March to June 2015 using PAPI method in shops offering organic food, localized in the urban area of Krakow. The study included 318 respondents who met the condition that they were organic food buyers for at least several months. The results obtained through analysis allowed to determine, the highest participation rate in the sample had the consumers purchasing organic products for several years. The most important purchase motives for organic products were health reasons and conviction that organic food is safe. The most significant criteria from the point of consumers view in the selection of organic products were the price as well as their labelling and aroma.

Key words: organic food, purchase motives, purchase criteria.

JEL code: D12, Q13.

Introduction

Food is a permanent component of human development history. It is a means, which not only ensures human survival, but also enables its development (Jezewska-Zychowicz, 2007). For ages people believed, that food in itself is healthy because it supplies the organism with nutrients crucial for its proper functioning (Waszkiewicz-Robak, 2002). However, currently applied food manufacturing methods striving at continuous improvement of efficiency at simultaneous lowering production costs, raise doubts among some part of society concerning the quality of products manufactured in this way. These food products usually contain excessive amounts of nitrates, heavy metals, pesticides and other harmful substances. Therefore, they may cause allergies, weaken human immune system and lead to a more frequent cases of civilizational diseases (Misniakiewicz, Suwala, 2006).

This situation causes that societies, particularly in highly developed countries become increasingly more interested in the environment protection issues showing their high ecological awareness. The phenomena perceived on this ground are evident not only as concern for the natural environment (Rachocka, 2003). "Green consumption" is easily noticeable on food market,

where the change in consumer behaviours is characterized mainly by a greater interest in food originating from sustainable agriculture without agricultural chemicals application.

Organic system of food production, beside obvious benefits for its consumers, also positively affects the general society. It helps to maintain biodiversity and protect the natural environment but also sustain it for future generations (Tyburski, Zakowska-Biemans, 2007).

Recognition of consumer needs and preferences is particularly important for food producers. The knowledge about consumer behaviours and their determinants are the issues crucial for marketing also at organic food market. Identification and understanding purchasing reasons of organic food provides a source of competitive advantage and helps to succeed on the market.

The main aim of research was to examine selected motives and criteria as factors affecting organic food buying process depending of the length period of its purchasing by consumers.

Research methods

Studies were conducted from March to June 2015 using PAPI method in shops offering organic food, localized in the urban area of Krakow

(Malopolska province, Poland). The study included 318 respondents who met the condition that they were organic food buyers for at least several months. Women constituted about 67.3 % of the surveyed, whereas men 32.7 %. Young persons, under 25 prevailed in the studied sample constituting 34.9 %. The respondents in the 26-35 age group made up 25.4 %, aged 36-45 constituted 20.8 %, whereas those over 45 constituted 18.9 % of the studied sample. Two respondent groups were identified according to the education level, in which 47.5 % declared secondary education, whereas 2.5 % higher education. Four groups were distinguished on the basis of the economic factor, i.e. income per person in the respondent families. The income of 1000 PLN per household member was declared by 29.9 % of the respondents, 33.0 % declared the income between 1001 and 1500 PLN, 22 % in the range from 1501-2000 PLN and 15.1 % of the respondents stated their incomes above 2000 PLN.

Structure indicators and arithmetic mean were used in descriptive analysis of the results. Non-parametric chi-square test was applied for the analysis of relationships between the features measurable on the nominal scale, whereas the strength of correlation relationship was tested using V Cramer coefficient. ANOVA was applied for the comparison of mean estimates made on the rank scale by k- independent respondent groups, while the post-hoc Tukey test was applied to determine the statistically significant differences between mean estimates. The assumed significance level (p-value) for all analyses was 0.05.

Research results and discussion

The respondents participating in the study were asked to indicate since when they were organic food buyers. The answers showed that 44.3 % of the surveyed declared buying organic products for several years, for over 21.3 % of the respondents the period was one year, whereas

the other studied persons (34.0 %) were purchasing these products for several months.

Verification of the obtained results by means of χ^2 test confirmed the existence of a weak relationship between the organic product buying period and the gender, age, education level and income per person in the respondents' households (Table 1). Considering the gender, a higher percentage of males than females declared the longest period of organic food buying. On the other hand, women more often than men declared buying organic products for over a year. The age also diversified the respondents due to the period of organic food buying. A pattern was observed, that the percentage of persons who were this food consumers for the longest period of time was growing with age. Moreover, the highest indicator of persons who were purchasing organic products for the shortest period was noted among the group below 25 years of age. Persons purchasing organic products for several months made up the highest percentage of the respondents under 25. Among the respondents with secondary education, persons buying organic products for several months made up the highest percentage, whereas in the group with higher education, those buying these products for several years. Considering the income level per person in the respondent households, the highest percentage of respondents who were buying this food for the longest period, was registered among those stating the income more than 2000 PLN.

The literature of the subject shows that purchases of organic food are determined by demographic and economic factors characterising the buyers. The category, which influences the perception and consumption of organic food is consumer gender. Studies conducted by Lea and Worsley (2005) indicate that women have more positive opinions about organic food than men. The well-established positive attitudes towards these products were reflected by the results obtained by Radman (2005). They confirm that a

higher percentage of females than males are consumers of organic food.

Table 1

The period of buying organic products vs. demographic features of respondents

| Demographic features | χ^2 | df | Cramer's V coefficient | p-value |
|--------------------------------|----------|----|------------------------|---------|
| gender | 13.235 | 2 | 0.204 | 0.001 |
| age | 27.899 | 6 | 0.209 | 0.000 |
| educational level | 19.971 | 2 | 0.251 | 0.000 |
| income per person in household | 37.157 | 6 | 0.241 | 0.000 |

Source: author's calculations based on author's research

Research conducted by Olivas and Bernabeu (2012) demonstrated that women and men may differ by the reasons why they buy organic food. Women are motivated for purchasing in the first place by healthy dietary habits, whereas men buy organic products mainly for social reasons.

Studies conducted by Arbinda et al. (2005) revealed that younger consumers are more inclined to buy organic food than older. Studies by Dimitri and Dettmann (2012) indicate that the level of education has a strong influence on potential organic food purchases.

Investigations conducted by Davies et al. (1995) in mid-nineties of the previous century revealed that a crucial factor affecting organic food purchases is consumer income. It was corroborated by the results obtained 10 years later by Arbindra et al. (2005) that the household income influences the potential purchase of organic food by consumers.

During the study the respondents assessed the motives for organic food purchasing using a 5-degree scale of importance, on which 1=completely unimportant factor, while 5=very important factor. It allowed ordering the analysed motives according to the hierarchy of their importance for the surveyed persons. According to the respondents, attention to health proved the most important reason for organic food buying (M=4.42; SD=0.97), then conviction that organic food is safe (M=4.00; SD=1.02) and that it has a high nutritional value (M=3.96;

SD=0.98), and better taste (M=3.68; SD=1.12). The evaluation of concern for animal welfare received the lowest mean value (M=3.19; SD=1.45).

As reported by Rembialkowska (2002), organic food reveals more health, nutritional and sensory values in comparison with food manufactured in a traditional way. It contains definitely less nitrates, nitrites and pesticide residues but far more of vitamin C and other vitamins, total sugars, valuable protein and minerals. Moreover, organic products have greater taste and aromatic value, which is of great importance for consumers. According to Kozelova et al. (2011) organic, particularly unprocessed food (vegetables and fruit) contains more active substances at simultaneous lower concentrations of harmful substances in comparison with traditional food. These facts influence the consumer perception of organic food and are corroborated by the literature of the subject. Authors presented a hierarchy of factors influencing organic products purchases, showing that they are determined mainly by the factors connected with consumer health and nutrition. Further, the purchases are encouraged by the taste, food safety and environmental concerns (e.g. Bourn, Prescott 2002). Studies by Olech and Kubon (2015) demonstrated that consumers are convinced of organic products safety, because they are free of artificial additives, such as preservatives or dyes. Greening of life causes that consumers attach increasingly greater importance to the natural environment. The results obtained by Tsakiridou et al. (2006) allow for the conclusion that the most important factors, on which organic food consumption depends, beside the attention to health, comprise care for the environment. Kozelova et al. (2013) obtained similar results. Among the analysed reasons for organic food purchasing, care for the environment and landscape were the most important for consumers. Some research indicates that increases also consumer awareness

on ethical attributes of organic food, like e.g. animal welfare (Tsakiridou et al., 2006; Zander, Hamm, 2010).

However, in the first place consumers show attention to their own health, which has a direct influence on their organic food choices. Attention to health distinguishes this group from the rest of the consumers on food market (Tung et al. 2012). It was confirmed by numerous studies which demonstrated that the main stimulus for buying organic food are health reasons (e.g. Hutchins, Greenhalgh, 1997; Zanolli, Naspetti, 2002; Magnusson et al., 2003; Chen, 2009; Mondelaers et al., 2009).

ANOVA results (Table 2) revealed differences in the evaluation of the reason for purchase, i.e. conviction that organic food is safe, depending on the length of period when it was purchased. The respondents who have been buying organic food for several years are the most convinced about its safety, whereas the least sure are those who have been purchasing it for several months. Statistical differences were also demonstrated in the evaluation of a fundamental reason for organic food consumption, i.e. attention to health. In this case the highest mean evaluation of this motive was obtained among persons who have been organic food buyers for over a year, whereas the lowest among new purchasers.

Obtained results allow also stating the differences in the evaluation of another reason for organic food purchasing, i.e. concern for animal welfare. The persons who have been organic food purchasers for several years reveal the highest awareness of these issues, whereas those who have been buying it recently reveal the lowest. Considering the other reasons inclining the respondents to buy organic food, no statistically significant differences were noted among the persons buying this food.

Both while choosing organic food and conventional food, the consumers take into consideration various criteria, perceivable as preference for some products. Among the factors, under evaluation using a 5-degree scale of importance, on which 1=completely unimportant factor, while 5=very important factor, the most important proved: the price (M=3.72; SD=1.14), labelling and aroma (in both cases the mean evaluation was 3.20 and SD accordingly was 1.32 and 1.24). Next in line were such factors as: the country of product origin (M=3.19; SD=1.35), its appearance (M=3.05; SD=1.21) and producer (M=2.81; SD=1.30). The least important factor was seller's suggestion (M=1.12; SD=1.06).

Table 2

Assessment of motives for organic products purchases depending on the period of their purchasing by the respondents

| Purchase motive | Period of purchasing organic food products | | | | | | F | p-value |
|---|--|------|-------------|------|----------------|------|--------|---------|
| | several years | | over a year | | several months | | | |
| | M | SD | M | SD | M | SD | | |
| conviction that organic food is safe | 4.21a | 0.86 | 3.96 | 0.98 | 3.73a | 1.29 | 5.970 | 0.003 |
| conviction that organic food has high nutritional value | 4.08 | 0.95 | 3.97 | 0.86 | 3.79 | 1.20 | 2.462 | 0.087 |
| conviction that organic food tastes better | 3.77 | 1.20 | 3.46 | 1.10 | 3.69 | 1.16 | 1.767 | 0.173 |
| attention to health | 4.58a | 0.67 | 4.79b | 0.66 | 3.95a,b | 1.37 | 19.843 | 0.000 |
| concern for animal welfare | 3.49a | 1.50 | 3.34b | 1.23 | 2.72a,b | 1.58 | 8.617 | 0.000 |

M - mean, SD - standard deviation

^{a,b} - differences between means are statistically significant at p <0.05

Source: author's calculations based on author's research

Organic products usually have higher prices than traditional foodstuffs. Price plays a crucial

role in the process of purchasing organic foods (Gottschalk, Leistner 2013) and since years is

regarded mainly as inhibiting the access to organic food market for a wide audience of consumers. It should be remembered that organic products are not mass produced, so aligning conventional and organic food prices cannot be expected. High prices are affected by a number of factors. Firstly, production process is time and labour consuming, because there is no possibility to use plant protection. According to Zakowska-Biemans (2011), the price level for organic food in Poland depends not only on higher costs of the food production, but is also connected with among others, poor development of national organic food processing and high margins for this food.

A crucial factor affecting the decisions about organic products' choice is sensory values, such as taste, aroma or appearance which distinguish them (Padel, Foster 2005).

An important element of organic products is their labelling. It results from the studies of

Matysik-Pejas and Zmuda (2010), that a majority of consumers recognize this kind of food on the basis of its certification body logo but are also guided by the graphic symbol of organic food. Yet, for some of the surveyed, the synonym associated with organic product origin was information about "healthy food", whereas it is usually an overused marketing slogan, which often has nothing to do with ecology. Results of conducted analysis (Table 3) indicate statistically significant differences between the evaluations made by the respondents, depending on the period of their organic food purchasing. It refers to, among others labelling of organic products on the basis of which the respondents identify them. The highest evaluation of labelling as a criterion of purchases was obtained from persons who were organic products buyers for the longest period. Building trust to one's offer by a producer will pay off by loyal customers looking for the products of specific producers.

Table 3

Assessment of criteria of organic products purchase depending on the period of their purchasing by the respondents

| Purchase criteria | Period of purchasing organic food products | | | | | | F | p-value |
|---------------------|--|------|-------------|------|----------------|------|-------|---------|
| | several years | | over a year | | several months | | | |
| | M | SD | M | SD | M | SD | | |
| labelling | 3.41a | 1.23 | 3.40b | 1.01 | 2.78a,b | 1.52 | 8.377 | 0.000 |
| appearance | 3.02 | 1.22 | 3.04 | 1.04 | 3.03 | 1.31 | 0.008 | 0.992 |
| aroma | 3.18 | 1.22 | 3.26 | 0.91 | 3.19 | 1.44 | 0.126 | 0.882 |
| producer | 3.12a | 0.92 | 2.86b | 1.25 | 2.47a,b | 1.48 | 5.792 | 0.003 |
| country of origin | 3.37a | 1.27 | 3.35b | 1.03 | 2.75a,b | 1.54 | 7.612 | 0.000 |
| price | 3.58 | 1.26 | 4.03 | 0.91 | 3.60 | 1.62 | 2.927 | 0.055 |
| seller's suggestion | 1.79a | 0.92 | 1.81b | 1.22 | 2.38a,b | 0.95 | 8.449 | 0.000 |

M - mean, SD – standard deviation

^{a,b} - differences between means are statistically significant at p <0.05

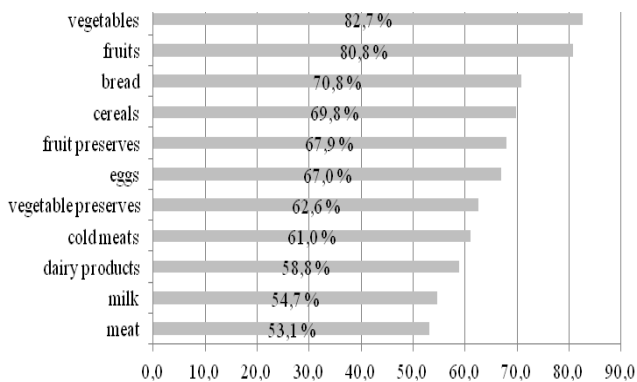
Source: author's calculations based on author's research

The analysis revealed statistically significant differences between the respondents concerning the evaluation of the factor influencing their organic products choice, i.e. the producer. This purchase criterion was estimated higher by the persons buying organic products for the longest time. The country of product origin proved equally important purchase criterion to the surveyed. The place of production plays an important role in food product choice;

particularly, unprocessed food should originate from the closest vicinity of the consumers. The last factor, for which differences in respondents' opinions were stated, is the fact whether they considered the seller's suggestions in their product choice. In this case, the respondents buying organic food for several months proved the most inclined to use this kind of assistance.

Among the organic food products offered by points of sales, vegetables and fruit obtained the

highest indicators declared by the respondents. Over 80 % of the surveyed buy them. The least popular products are milk and meat, purchased by over a half of the surveyed persons.



Source: author's calculations based on author's research

Fig. 1. Purchases of individual organic product groups declared by the respondents

Verification using χ^2 test confirmed the existence of weak relationship between the declared purchases of individual organic product groups and the period of these products buying by the respondents with reference to all analysed groups, except bread ($\chi^2=0.5235$, $df=2$, $V=0.0406$, $p>0.05$).

Research conducted in different countries (O'Donovan, McCarthy, 2002; Padel, Foster, 2005; Cerjak et al., 2010) shows fruit and vegetables to be the most frequently bought kind of organic products. Sometimes consumer experience with organic food ends just with these products.

The low indicator of the respondents concerning milk, meat and their products purchases is due to their poorer availability and insufficient offer of these products is points of sales in Poland (Luczka-Bakula, 2007). It should be also remembered that organic products, due to the absence of preservatives, have rather short shelf lives, which makes their turnover very difficult. Therefore, points of sales limit their assortment to the products which may be stored longer.

Conclusions

Consumers are very important element of the market and further development of organic product market will depend just on them. Therefore, the circumstances which affect their behaviours are worth identifying.

- 1) Purchase and consumption of organic food are determined by many circumstances, including demographic-economic factors. While analysing the profile of organic food buyers, a prevalence of young women with higher education is visible, who declare an income per their household member below 1500 PLN.
- 2) For the respondents, consumption of organic food does not seem to be a question of fashion or temporary trend, because a majority formed a group of its permanent buyers. It is worth noticing, that the experience and interest in the environment protection issues become apparent in the evaluation of the importance of organic food purchase motives. It may be noticed, that as compared with the other surveyed, the persons only recently buying organic food have a lower awareness of some issues fundamental for ecology, such as the conviction that organic food is safe, that it has high nutritional value or concern for animal welfare. It denotes the need for the activities educating consumers and promoting the issues connected with obtaining food from organic production and processing methods.
- 3) In Poland, organic food market is still developing; therefore, the difference in price between the organic and traditional food may be higher than in the countries where the market has a stabile position. Prices for organic food products are the main barrier to their purchase; however, it may be noticed that it is the least important for the persons who have been purchasing it for the longest time. The fact, that consumers are sensitive to the originality of food, should be regarded as positive. During purchasing, it is important for

them to make sure if the products have appropriate labelling (e.g. organic food logo). In this case, it is apparent that the persons buying these products for the shortest period, evaluated this factor importance as the lowest. The country of product origin and producer loyalty have a considerable influence on the product choice, particularly for the

respondents buying organic products for years.

- 4) Consumers most frequently purchase organic vegetables and fruit. It is due to a wide availability of this offer and possibly also to a lower difference in prices of these products as compared to their traditional counterparts.

Bibliography

1. Arbindra, P.R., Moon, W., Balasubramanian, S. (2005). Agro-biotechnology and Organic Food Purchase in the United Kingdom. *British Food Journal*, Volume 107, Issue 2, pp. 84-97.
2. Bourn, D., Prescott, J. (2002). A Comparison of the Nutritional Value, Sensory Qualities and Food Safety of Organically and Conventionally Produced Foods. *Critical Reviews in Food Science and Nutrition*, Volume 42, Issue 1, pp. 1-34.
3. Cerjak, M., Mesiu, Z., Kopiu, M., Kovapiu, D., Markovina, J. (2010). What Motivates Consumers to Buy Organic Food: Comparison of Croatia, Bosnia Herzegovina, and Slovenia. *Journal of Food Products Marketing*, Volume 16, Issue 3, pp. 278-292.
4. Chen, M.F. (2009). Attitude Toward Organic Foods among Taiwanese as Related to Health Consciousness, Environmental Attitudes, and the Mediating Effects of a Healthy Lifestyle. *British Food Journal*, Volume 111, Issue 2, pp. 165-178.
5. Davies, A., Titterton, A.J., Cochrane, C. (1995). Who Buys Organic Food?: A Profile of the Purchasers of Organic Food in Northern Ireland. *British Food Journal*, Volume 97, Issue 10, pp. 17-23.
6. WDimitri, C., Dettmann, R.L. (2012). Organic Food Consumers: What Do We Really Know about Them? *British Food Journal*, Volume 114, Issue 8, pp. 1157 – 1183.
7. Gottschalk, I., Leistner, T. (2013). Consumer Reactions to the Availability of Organic Food in Discount Supermarkets. *International Journal of Consumer Studies*, Volume 37, Issue 2, pp. 136-142.
8. Hutchins, R., Greenhalgh, L. (1997). Organic Confusion: Sustaining Competitive Advantage. *British Food Journal*, Volume 99, Issue 9, pp. 336-338.
9. Jezewska-Zychowicz, M. (2007). Zachowania żywieniowe i ich uwarunkowania (Nutritional behaviour and their determinants). Wydawnictwo SGGW, Warszawa, p 6.
10. Kozelova, D., Mura, L., Matejkova, E., Lopasovsky, L., Vietoris, V., Mendelova, A., Bezakova, M., Chrenekova, M. (2011). Organic Products, Consumer Behavior on Market and European Organic Product Market Situation. *Potravinarstvo*, Volume 5, No. 3, pp. 20-26.
11. Kozelova, D., Vietoris, V., Fikselova, M. (2013). Quality and Availability of Organic Foods by Slovak Consumers. *Potravinarstvo*, Volume 7, No. 1, pp. 146-150.
12. Lae, E., Worsley, T. (2005). Australians' Organic Food Beliefs, Demographics and Values. *British Food Journal*, Volume 107, Issue 11, pp. 855-869.
13. Luczka-Bakula, W. (2007). Rynek żywności ekologicznej. Wyznaczniki i uwarunkowania rozwoju (The organic food market. Determinants and conditions of development). Wydawnictwo PWN, p. 189.
14. Magnusson, M. K., Arvola, A., Koivisto Hursti, U.-K., Lars Aberg, L., Sjoden, P.-O. (2003). Choice of Organic Foods is Related to Perceived Consequences for Human Health and to Environmentally Friendly Behaviour. *Appetite*, Volume 40, Issue 2, pp. 109-117.
15. Matysik-Pejas, R., Zmuda, J. (2011). Wybrane uwarunkowania percepcji żywności ekologicznej przez konsumentów (Selected determinants of perception of organic food by consumer). *Roczniki Naukowe SERIA*, Tom XIII, Zeszyt 4, pp. 124-128.
16. Misniakiewicz, M., Suwała, G. (2006). Ecological Food in the Consciousness of Poles. *Zeszyty Naukowe Akademii Ekonomicznej w Krakowie*, No. 705, pp. 57-74.
17. Mondelaers, K., Verbeke, W., Van Huylenbroeck, G., (2009). Importance of Health and Environment as Quality Traits in the Buying Decision of Organic Products. *British Food Journal*, Volume 111, Issue 10, pp. 1121-1139.
18. O'Donovan, P., McCarthy, M. (2002). Irish Consumer Preference for Organic Meat. *British Food Journal*, Volume 104, Issue 3/4/5, pp. 353-370.
19. Olech, E., Kubon, M. (2015). Motywy wyboru produktów ekologicznych przez konsumentów segmentu demograficznego z terenu Małopolski (Motives selection of organic products by consumers of the demographic segment from Małopolska). *Roczniki Naukowe SERIA*, Tom XVII, Zeszyt 1, pp. 164-169.
20. Olivas, R., Bernabeu, R., (2012). Man's and Women's Attitudes toward Organic Food Consumption. A Spanish case study. *Spanish Journal of Agricultural Research*, Volume 10, No. 2, pp. 281-291.
21. Padel, S., Foster, C. (2005). Exploring the Gap between Attitudes and Behaviour. Understanding why Consumers Buy or Do Not Buy Organic Food. *British Food Journal*, Volume 107, Issue 8, pp. 606-625.
22. Rachocka, J. (2003). Problemy globalizacji. Dekonsumpcja, domocentryzm, ekologizacja życia – nowe trendy konsumenckie w rozwiniętych gospodarkach rynkowych (The problems of globalization. Deconsumption, greening

of life - a new consumer trends in developed market economies) in: Problemy globalizacji gospodarki (Problems of globalization) ed. T. Bernat, Wydawnictwo PTE, Szczecin, pp. 185-191.

23. Radman, M. (2005). Consumer Consumption and Perception of Organic Products in Croatia. *British Food Journal*, Volume 107, Issue 4-5, pp. 263-73.
24. Rembialkowska, E. (2002). Jakosc zywnosci pochodzacej z gospodarstw organicznych (The quality of food from organic farming) in: Jakosc zywnosci a rolnictwo ekologiczne (The quality of food from organic farming). Projekt Flair-Flow Europe IV, Kraków, pp. 19-30. Retrieved: www.pttz.org/flair/info/zyw_ekol.rtf. Acces: 4.01.2017.
25. Stobbelaar, D.J., Casimir, G., Borghuis, J., Marks, I., Meijer, L., Zebeda, S. (2007). Adolescents' Attitudes towards Organic Food: a Survey of 15- to 16-year Old School Children. *International Journal of Consumer Studies*, Volume 31, Issue 4, pp. 349-56.
26. Tsakiridou, E., Boutsouki, Ch., Zotos, Y., Matta, K. (2006). Attitudes and Behaviour towards Organic Products: an Exploratory Study. *International Journal of Retail & Distribution Management*, Volume 36, Issue 2, pp. 158-175.
27. Tung, S.-J., Shi, Ch.-Ch., Wei, S., Chen, Y.-H. (2012). Attitudinal Inconsistency toward Organic Food in Relation to Purchasing Intention and Behavior: An Illustration of Taiwan Consumers. *British Food Journal*, Volume 114, Issue 7, pp. 997-1015.
28. Tyburski, J., Zakowska-Biemans, S. (2007). Wprowadzenie do rolnictwa ekologicznego (Introduction to organic farming). Wydawnictwo SGGW Warszawa, p 19.
29. Waszkiewicz-Robak, B. (2002). Substancje dodatkowe w rynkowych produktach spozywczych (Additional substances in food products). *Przemysł Spozywczy*, No. 5, pp. 18 -22.
30. Zander, K., Hamm, U. (2010). Consumer Preferences for Additional Ethical Attributes of Organic Food. *Food Quality and Preference*, Volume 21, Issue 5, pp. 495-503.
31. Zanolì, R., Naspetti, S. (2002). Consumer Motivations in the Purchase of Organic Food: a Means-end Approach. *British Food Journal*, Volume 104, Issue 8, pp. 643-653.
32. Zakowska-Biemans, S. (2011). Barriers to Buy Organic Food in the Context of Organic Food Market Development. *Journal of Research and Applications in Agricultural Engineering*, Volume 56, No.4, pp. 216-220.

SPORTS ROLE IN ECONOMICS

Ieva Opolska¹, Mg.oec.; Liga Proskina¹, Dr.oec.

¹Faculty of Economics and Social Development, Latvia University of Agriculture

Abstract. The research analyses the sports and mega-sports events impact on the economics. The authors gathered studies and literature about the major sports markets, mega sports events, the economics of sports and the case study for the EuroBasket 2015 Latvia. Mostly, sport is viewed from the results, but it is very versatile. Sports-related sectors are health, education, entertainment, tourism, economics and others. This time, the authors' aim was to analyse recent researches on the sport and mega-events impact on the economics. To achieve the aim, the following specific tasks were set: 1) to give insight into the situation in the field of sport and mega sports events, placing a particular focus on its impact on region's economics; 2) to analyse the papers of sports impact on economics, biggest sports markets and mega sports events; 3) to assess the EuroBasket 2015 impact on the economy of Latvia. Results showed that Sport and mega sports events can be beneficial to the region's economy, but it is necessary to make in-depth research and estimates to calculate it. The conclusions of the paper are: North America is ahead of the other countries and it makes it as the world's largest sports market and it suggests that the role of sport will continue to grow and that sport not only contributes to better health, people's socializing and belonging to the particular team, but it will also make a significant contribution to the regional or national economics; The EuroBasket 2015 case showed that it is in many ways Beneficial event, especially the impact on the economy of Riga and the country's image building, this suggest that the country needs to encourage large, international tournaments organizing.

Key words: sports economics, sports, sports events.

JEL code:

Introduction

Often sport and physical activity is linked solely to the sport at schools and leisure activities, undermining its contribution to a number of other processes and activities. For example, sport is closely linked to education, tourism, health and entertainment. Each of the above has made up a major role in the national economy.

Physical inactivity is the fourth leading risk factor for mortality globally and is responsible for 6 % of deaths worldwide and for around 10 % in the World Health Organization (WHO) European Region. Every year in the European Region, over 8 million disability-adjusted life years are lost because of insufficient physical activity, and nearly one million deaths are attributed to insufficient physical activity (WHO, 2009).

The commercial sports and entertainment sectors nowadays are much closer than ever before and one complements the other. Sports economics is playing more important role in our lives, which is associated with tickets, media rights, merchandising, and sponsorship. There were forecasts that in 2015 professional sports globally should generate \$145 billion in revenue.

At the moment, we do not have data if forecast came true or not (PWC, 2011).

Economists and scientists have widely studied the sports role in economic growth, as well as the importance of sport for people's physical activity promotion.

However, in the light of the growing role of sport in economic processes, it is necessary to do an in-depth study for theoretical aspects of sports economics.

Many people love sport. Thus, sports economics provides an opportunity to analyse some key economic concepts to the sports industry. Key concepts can be used to analyse and understand the role that economic incentives play in determining the behaviour of controlling bodies, leagues, clubs, players, fans, sponsors, the media and government.

In our study, we provide a literature review of economics impact and benefits of sports.

The study aims to determine whether sports and major sports events can give a positive impact on the region's economy, based on other authors' research analysis.

To achieve the aim, the following *specific tasks* were set: 1) to give insight into the

situation in the field of sport and mega sports events, placing a particular focus on its impact on region's economics; 2) to analyse the papers of sports impact to economic, biggest sports markets and mega sports events; 3) to assess the EuroBasket2015 impact to the Latvia economic.

Research hypothesis: The role of sport in the economics continues to grow.

In the scope of the research, the authors used the following research methods: monographic, logical construction and graphic methods. Statistical analysis as well as analysis and synthesis were employed to process the data.

The present research also used the following policy document: The Sports Policy guidelines 2014-2020 (Latvia).

Research object: sports economics

By applying various research methods, 27 documents focusing on sport and sports economic were analysed. The authors gathered studies and literature about the major sports markets, on mega sports events, the economics of sports and the case study for the EuroBasket 2015 Latvia.

Definitions

For the purpose of this article, the following working definitions were used:

- Sport: Comprises all forms of physical activity which, through casual or organized participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships, or obtaining results in competition at all levels (Council of Europe, 2017).
- Sports market: For the purposes of this report, the sports market consists of: Sponsorships, which include payments to have a product associated with a team, league or event and naming rights. Gate revenues for live sporting events. Media rights fees paid to show sports on broadcast and cable television networks, television stations, terrestrial radio, satellite radio, the internet and on mobile

devices. Merchandising, which includes the selling of licensed products with team or league logos, player likenesses, or other intellectual property. Food concession revenues are not included (PWC, 2011).

Research results and discussion

In the White Paper on Sport is written "Sport is a growing social and economic phenomenon which makes an important contribution to the European Union's strategic objectives of solidarity and prosperity. The Olympic ideal of developing sport to promote peace and understanding among nations and cultures as well as the education of young people was born in Europe and has been fostered by the International Olympic Committee and the European Olympic Committees (White paper on Sport, 2007).

Alex Bryson, Bernd Frick and Rob Simmons findings indicate that economists' interest in sports has grown dramatically in Europe and North America over the past twenty years. Today there are two journals devoted to sports economics the Journal of Sports Economics and the International Journal of Sport Finance (Bryson, A., Frick, B., & Simmons, R., 2015).

Significant findings of the sports economic has underlined Roon Both, indicating that sports economics typically cuts across several fields of economics, involving microeconomic concepts applied to sport and industrial organization, labour economics, and public finance. Australian researcher who specializes in sports economics says that sports economics can be a useful way of illustrating comparative advantage (Booth R., 2009).

In recent decades, sport has both contributed to and been shaped by globalization. The Olympic Games are the largest regularly scheduled international mass gathering. More than billions people are following the event via the media, thousands of athletes, team officials, press, and spectators.

At the most recent Summer Olympic Games in Rio de Janeiro, more than 10,000 athletes,

representing 207 nations, competed in 31 sports in Brazil, with 306 sets of medals awarded over the course of the Games. The Olympic Games are truly global events, headed by countless processes and uncountable people. Can not be assessed Games intangible influence on the national and world culture and social attitudes (Olympic, 2016).

PWC's report in 2011 had said that in many cases, sporting entertainment and commercial success have to look more closely together. Sports and entertainment go hand in hand nowadays, successfully sharing their experiences and complementing each other (PWC,2011).

1. Sports economics, significance and opportunities

Sports economics is a relatively new field of the economics. To find out how sports affect the economics, authors analysed several international papers about sports economics and its impact on the economy.

North American authors Peter A. Groothuis and Kurt W. Rotthoff note that the economic impact of sports has been studied in two main ways: through local economic impact and through the impact of mega-events (Groothuis, P. A., &Rotthoff, K. W., 2016).

Over the past few years, researchers have analysed more regional data as hotel occupancy rates, local tax revenues, and the main activities related to income and other indirectly related entertainment revenues. Thus, searching for sports events benefits to the economics.

Peter A. Groothuis and Kurt W. Rotthoff survey (2006) results of the general population in the United States showed that the majority of respondents believe that sports teams or mega-events do not generate a local economic impact. Authors deduced that the majority of the economics literature also concludes that having a professional sports team or hosting a major event does not generate a local economic impact (Groothuis, P. A., &Rotthoff, K. W., 2016).

A 2007 European Commission White Paper on Sport for Sport indicated that, in 2004, sports generated value added of 407 billion euros accounted for 3.7 per cent of EU GDP (White Paper on Sport, 2007).

According to White Paper, sports may be used also as a tool for regional development. Knowing that the regions are diverse in their interests and abilities, sport can be a tool to develop regions, cities or rural areas.

Synergies can be identified between sport and tourism and sport can stimulate the upgrading of collective infrastructure (e.g. transport networks) and the emergence of new mechanisms for their financing (e.g. public-private partnerships) (White paper on Sport, 2007).

Currently (2014 - 2020), in the European Union there is opened a new sport-related projects programme called "Erasmus + Sport". The Sport Chapter in the Erasmus+ Programme aims to support European partnerships on grassroots sport in order to pursue the following objectives:

- tackle cross-border threats to the integrity of sport, such as doping, match fixing and violence, as well as all kinds of intolerance and discrimination;
- to promote and support good governance in sport and dual careers of athletes;
- to promote voluntary activities in sport, together with social inclusion, equal opportunities and awareness of the importance of health-enhancing physical activity, through increased participation in, and equal access to sport for all (EACEA, 2017).

Regional policy instruments can also play a role in preparing and ensuring the sustainability of certain major sporting events.

There is no one definition of sports benefit on the economy, neither a mathematical formula. Papers and documents show that the regions may have economic benefits from sports. It is necessary to make more in-depth analysis with

extensive data to determine the economic impact of sport.

2. The biggest sports markets

Sports organisations have many sources of income, including club fees and ticket sales, advertising and sponsorship, TV and media rights, re-distribution of income within the sport federations, merchandising, public support etc. Public financial support is often vital for sport but must be provided within the limits imposed by law.

Stefan Szymanski notes that as a business, the biggest team sports are located in the United States (baseball, basketball, American football, ice hockey) and Europe (Football) – although Japanese baseball is also significant commercial undertaking. Sports Commercialisation occurred in America has evolved much earlier than elsewhere in the world, so now it is more developed than in Europe and elsewhere (Szymanski, S., 2001).

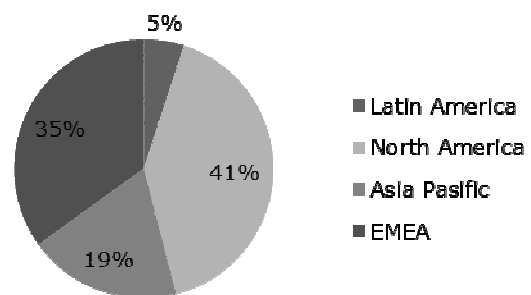
Global sports market revenue (2011) shows that the North American sports market is the biggest in the world with more than 50 billion U.S. dollars in revenue generated there. The major sports leagues – the National Football League (NFL), Major League Baseball (MLB), the National Basketball Association (NBA) and the National Hockey League (NHL) – have a strong share in the market. The NFL for example generates almost 9 billion U.S. dollars in revenue each year, the NBA around 3.7 billion U.S. dollars.

In comparison, the European football market has an estimated size of 19.4 billion euros (23.8 billion U.S. dollars). Just less than 50 % of this revenue is generated by the so-called "Big-Five" leagues. The term refers to the top-tier football leagues in England (Premier League), Germany (Bundesliga), Spain (Primera Division), Italy (Serie A) and France (Ligue 1). The Barclays Premier League is the biggest of the five with revenue of 2.9 billion euros (statista.com, 2017).

In nowadays, sports are big business. From athletes, managers, media, arenas, cities, tourism and events agencies and gambling to other sectors that's makes profit.

Company PWC in December 2011 did a research for global sports markets 2015. Global sports revenues were valued at US\$121.4 billion in 2010, a strong year due to the FIFA World Cup in South Africa.

PWC calculated that over the next five years to 2015, there will be a compound annual growth rate of 3.7 % to achieve global revenues of US\$145.3 billion.



Source: PWC, 2011

Fig. 1. Global revenues split by region, 2010

North America starts the period as the largest region with 41 % of total revenue, and whilst Latin America will see the highest growth rates, since it starts a relatively small market, it only gains comparatively limited market share. EMEA is the second largest market, but will experience the lowest growth rate over the period (PWC, 2011).

There is a clear sports industry's rapid development and as studies show - North America is ahead of the other countries and it makes it as the world's largest sports market. Not only sports market, but also with the high sports results.

3. Mega events

The first time when mega-events became an important area of the tourism and leisure in the literature was in 1980s. Authors looked for the economic benefits of large sports events analysed sports within multidisciplinary approaches. Within

the area of mega-events, sports events have attracted a significant amount of attention (Gratton, C., Shibli, S., & Coleman, R., 2006).

One of the first major studies in this area was the study of the impact of the 1985 Adelaide Grand Prix (Burns, Hatch & Mules, 1986).

Assessing the economic impact of mega-events requires further consideration. Mega-events (for example, the World Cup, Olympics, European Championship, Champions league, Euro league) attract many thousands of visitors to a city. The visitors generally bring "new" money to the area, rather than just relocate spending within an area. To the extent that the visitors stay for longer periods of time and spend higher amount per day, mega-events may benefit a local economy. From a broader (for example, country) perspective, however, there remains considerable expenditure switching, as tourism money generated by a popular event in one country often comes at the expense of expenditures in other countries (Mules 1995).

Cities staging major sports events have a unique opportunity to market themselves to the world.

Mules and Faulkner (1996) point out that hosting major sports events is not always an unequivocal economic benefit to the cities that host them. They emphasize that, in general, staging major sports events often results in the city authorities losing money even though the city itself benefits greatly in terms of additional spending in the city (Gratton, C., Shibli, S., & Coleman, R., 2006).

As an example we can mention the Olympic Games. None of the Olympic Games are organized, where revenues exceed expenses. Also, looking back to last summer Olympic Games in Rio, the local people did not feel economic growth, but the Games played significant role to the national economy. Historically, hosting such mega-events has been a coveted honour and can act as a powerful

signal that an emerging power has arrived on the world stage.

Chris Gratton, Simon Shibli, and Richard Coleman have studied and analyzed the economic impact of major sports events in the United Kingdom (UK). Authors have provided a detailed overview of ten economic impact studies undertaken at major sports events, all World or European Championships, in the UK since 1997. Those 10 events were: 1997 World Badminton Championships, 1997 European Junior Boxing Championships, 1997 European Junior Swimming Championships, 1998 European Short Course Swimming Championships, 1999 European Show Jumping Championships, 1999 World Judo Championships, 1999 World Indoor Climbing Championships, 2001 World Amateur Boxing Championships, 2001 World Half Marathon Championships and 2002 World Snooker Championship. The authors' analysis mostly was based on using a standard questionnaire survey to interview key interest groups at an event and the data collected was then analysed using a specialist statistical software package and spreadsheets to calculate the additional expenditure in the host economy.

Results showed that the most significant economic impact is attributable to the 2002 World Snooker Championship (2.27 million of pounds) closely followed by the 1997 World Badminton Championships (2.22 million of pounds). Both these events took place over a two week period and this extended period for the events did lead to higher economic impact (Gratton, C., Shibli, S., & Coleman, R., 2006).

Mega events can be viewed twofold - sporty significant and large by the benefits they provide. Not always the World Cup will bring more benefits than the European Championship.

4. The case study – Euro basket 2015, Latvia

FIBA EuroBasket 2015 was the 39th annual edition of the EuroBasket championship that is organised by FIBA Europe. It took place in four

different countries: Croatia, France, Germany, and Latvia (FIBAEUROPE, 2017). In September 2015, the European Basketball Championship Group D match took place in Riga. Three Latvian authors right after Championship did research about economic benefits from this mega-event.

Aim of the study was to determine the economic benefits and the impact of the state budget from European Basketball Championship. To determine the EuroBasket 2015 impact on the Latvian economy, the authors Elmars Kehris, Roberts Reihmanis and Toms Stanbergs conducted a championship economic analysis of the different sources of income in the tournament. Most of them were visitors' expenditures during the championship, as well as income from the tickets.

Each of the teams during the period played five group games. Overall Championship was followed by 140 thousand people - 86 thousand of them onsite. (696 593 - Population in Riga in August 2015) (Rigas pasvaldiba, 2017). 55 % of visitors were foreigners (Kehris, E., Reihmanis, R., Stalbergs, T., 2015).

According to the sources of income analysis, it was concluded that the measure as a whole Latvian economy has brought more than 15.3 million, which is a direct complement to national budgets, with more than 2.2 million Euro VAT revenue. Based on the results it is concluded that the following events in addition to sports, country image and the development of tourism, also provide significant economic benefits to the organizing state (Kehris, E., Reihmanis, R., Stalbergs, T., 2015).

Direct income - Latvia Basketball Association revenue arising from the event organization are:

- income from tickets;
- income from sponsors;
- municipal grants;
- state grants;
- income from partners.

Indirect incomes - national incomes as a result of the championship: income from tourists.

Visitors' spending can be divided into the following blocks:

- travel expenses - costs for transportation during the event;
- HoReCa (hotel, restaurant and cafe) - expenditure (expenditure on food and drinks outside the home / accommodation (including alcoholic beverages);
- other expenses - souvenirs, clothes, etc.

Following the results of the study, it was concluded that the EuroBasket 2015 generated EUR 15.391.200 direct impact on the Latvian economy. Studies showed that foreign visitors brought EUR 10.172.600 to the country's economy in addition, of which the majority was related to visitor accommodation costs (EUR 6.343 million). Based on the study, the indirect profitability coefficient was 4.27, which indicates that every euro spent, which was due to the organization of EuroBasket 2015, for Latvian national economy generated 4.27 euro in turnover. The authors indicate that the potential tax revenues generated by EuroBasket 2015 in Latvia amounted to EUR 2.245.500 (Kehris, E., Reihmanis, R., Stalbergs, T., 2015).

The authors of article want to point out that the Latvian example clearly shows how one in national level important event can give not only social but also measurable economic impact. Research reaffirms how various, effective and useful sports can be in different cases.

Conclusions

This research showed that the sports role in regional and national economies is important.

This paper makes several central points.

- 1) Studies and documents show that sport and mega sports events can be beneficial to the region's economy, but it is necessary to make in-depth research and estimates to calculate it.
- 2) Studies show, North America is ahead of the other countries and it makes it as the world's largest sports market and it suggests that the role of sport will continue to grow and that

sport not only contributes to better health, people's socializing and belonging to the particular team, but it will also make a significant contribution to the regional or national economics.

country's image building, this suggest that the country needs to encourage large, international tournaments organizing.

This means that the hypothesis put forward has been proved.

3) The EuroBasket 2015 case showed that it is in many ways Beneficial event, especially the impact on the economy of Riga and the

In conclusion, there is a wider implication that can be drawn from this study material.

Bibliography

1. *Rio 2016: The Greatest Show on Earth in Stats*. (2016). Retrieved: <http://www.bbc.com/sport/olympics/37148372>. Access: 15.12.2016.
2. Booth, R. (2009). Sports Economics. *The Australian Economic Review*, Volume 42, Issue 3, pp. 377–385.
3. Bryson, A., Frick, B., & Simmons, R. (2015). Sports Economics: It May be Fun but What's the Point? *National Institute Economic Review*, Volume 232, Issue 1, pp. R1–R3.
4. Burns, J. P. A., Hatch, J. H. and Mules, T. J. (eds) 1986, *The Adelaide Grand Prix: The Impact of a Special Event*, Centre for South Australian Economic Studies, University of Adelaide.
5. Christiansen, N. V., Kahlmeier, S., & Racioppi, F. (2014). Sport Promotion Policies in the European Union: Results of a Contents Analysis. *Scandinavian Journal of Medicine and Science in Sports*, Volume 24, Issue 2, pp. 428–438.
6. *European Manifesto on Young People and Sport*. (1995). Retrieved: http://www.coe.int/t/dg4/sport/resources/texts/spmanif_en.asp. Access: 12.12.2016.
7. *Erasmus + Sport*. (2017). Retrieved: <http://eacea.ec.europa.eu/home/erasmus-plus/actions/sport>. Access: 19.11.2016.
8. *European Commission White Paper on Sport*. (2007). Retrieved: http://www.aop.pt/upload/tb_content/320160419151552/35716314642829/whitepaperfullen.pdf. Access: 03.11.2016.
9. *EuroBasket 2015 Hosts Announced*. (2014). Retrieved: http://www.fibaeurope.com/cid_VHACRq3JST668RpnEPBL82.coid_hXEMBL2UIJACgyayS2lyh3.articleMode_on.html. Access: 29.11.2016.
10. Gratton, C. & Taylor, P., *Economics of Sport and Recreation* (2002). Retrieved: <https://books.google.lv/books?id=GmWQAgAAQBAJ&lpg=PA179&ots=YIKIGEPRAY&dq=One%20of%20the%20first%20major%20studies%20in%20this%20area%20was%20the%20study%20of%20the%20impact%20of%20the%201985%20Adelaide%20Grand%20Prix&hl=lv&pg=PA179#v=onepage&q&f=false>. Access: 29.11.2016.
11. Gratton, C., Shibli, S., & Coleman, R. (2006). The Economic Impact of Major Sports Events: A Review of Ten Events in the UK. *Sociological Review*, Volume 54, Issue 2, pp. 41–58.
12. Groothuis, P. A., & Rotthoff, K. W. (2016). The Economic Impact and Civic Pride Effects of Sports Teams and Mega-Events: Do The Public and the Professionals Agree? *Economic Affairs*, Volume 36, Issue 1, pp. 21–32.
13. Ito, T., Iwata, K., Mckenzie, C., Noland, M., & Urata, S. (2016). The Economics of Sport in Asia: Editors' Overview. *Asian Economic Policy Review*, Volume 11, Issue 1. pp. 1-15.
14. Jones, C., Munday, M., & Roche, N. (2010). Can Regional Sports Stadia Ever Be Economically Significant? *Regional Science Policy & Practice*, Volume 2, Issue 1, pp. 63–77.
15. Kehris, E., Reihmanis, R., Stalbergs, T. (2015), *Petijums par EuroBasket 2015 raditajiem ekonomiskajiem ieguvumiem un ietekmizvalsts budzetaienemumiem*. Retrieved: http://i8.tiesraides.lv/files/2015-12/2015-12-17-eb2015_ekonomiskie_ieguvumi-1450359168.pdf. Access: 29.11.2016.
16. Mules, T. 1995, *The Economic Impact of Special Events*, Paper Presented to Regional Economic Issues in Australia Conference, University of Sydney, 2006.
17. Olympic Games (2016). *RIO 2016*. Retrieved: <https://www.olympic.org/rio-2016>. Access: 02.01.2017.
18. *Changing the Game. Outlook for the Global Sports Market to 2015*. (2011). Retrieved: <http://www.pwc.com/gx/en/hospitality-leisure/pdf/changing-the-game-outlook-for-the-global-sports-market-to-2015.pdf>. Access: 10.12.2016.
19. *Riga skaitlos*. (2015). Retrieved: https://pasvaldiba.riga.lv/LV/Channels/About_Riga/Riga_in_numbers/default.htm. Access: 12.11.2016.
20. Ringuet-Riot, C., Carter, S., & James, D. A. (2014). Programmed Innovation in Team Sport Using Needs Driven Innovation. *In Procedia Engineering*. Volume 72, pp. 6.
21. Siegfried, J., & Zimbalist, A. (2006). The Economic Impact of Sports Facilities, Teams and Mega-events. *Australian Economic Review*, Volume 39, Issue 4, pp. 420–427.
22. Szymanski, S. (2001). Economics of Sport: introduction. *The Economics Journal*, Volume 111, Issue February, pp. F1-F3.

23. *Global Sports Market - Total Revenue from 2006 to 2015*. (2015). Retrieved: <https://www.statista.com/statistics/194122/sporting-event-gate-revenue-worldwide-by-region-since-2004/>. Access: 05.11.2016.
24. *The Sports Policy guidelines 2014-2020 (Latvia) (2013)*. Retrieved: http://www.lpkomiteja.lv/lpk/wp-content/uploads/2014/01/IZMPamn_121213_sports.pdf. Access: 02.11.2016.
25. Vrooman, J. (2000). The Economics of American Sports Leagues. *Scottish Journal of Political Economy*, Volume 47, Issue 4, pp. 364–398.
26. Wilson, J. K., & Pomfret, R. (2009). Government Subsidies for Professional Team Sports in Australia. *Australian Economic Review*, Volume 42, Issue 3, pp. 264–275.
27. *World Health Statistics*. (2009). Retrieved: http://www.who.int/whosis/whostat/EN_WHS09_Full.pdf?ua=1. Access: 12.12.2016.

CUSTOMER SATISFACTION WITH MOBILE OPERATORS' SERVICES IN LITHUANIAN RURAL AREAS

Lina Pileliene¹, PhD; Viktorija Grigaliunaite

¹Vytautas Magnus University

Abstract. In tough competitive conditions of Lithuanian mobile services market, customer satisfaction becomes one of the most important factors for customer retention and attraction. Lithuanian mobile market can be described as being in a maturity stage of its life-cycle: the prices and services of different mobile operators are quite similar. However, the network coverage and signal strength differs – main differences can be observed in rural areas of the country. Therefore, the scientific problem solved in the article is: what factors affect customer satisfaction with mobile operators' services in Lithuanian rural areas? The aim of this paper is to assess customer satisfaction with mobile operators' services in Lithuanian rural areas determining its antecedents and consequences. Questionnaire survey is provided to reach the aim. The research results show that the level of customer satisfaction with mobile operators' services in Lithuanian rural areas is moderate. Customer perceived quality and perceived value are found to be two most important factors affecting customer satisfaction with mobile operators' services in Lithuanian rural areas. Despite the moderate customer satisfaction, the level of customer loyalty with mobile operators' services in Lithuanian rural areas is high. Research results indicate that customer expectations and companies' image are managed properly and do not need improvement in order to enhance customer satisfaction and / or loyalty with mobile operators' services in Lithuanian rural areas. Moreover, customer complaints are also managed properly.

Key words: customer satisfaction, Lithuania, mobile operator.

JEL code: M31, L89, O18

Introduction

The topic of customer satisfaction is becoming one of the most widely discussed in marketing scholar as well as business society. Many companies assess their customer satisfaction achieving to improve the services they provide and determine the key failures leading their customers to defect. Based on a bundle of previous researches (Chu-Mei L. et al., 2014), many customer satisfaction index models (i.e. service-specific, industry-specific, country-specific, region-specific, nation-specific etc.) are created in order to enable and facilitate satisfaction measurement. Therefore, specific elements having impact on customer satisfaction are established; however, the size of the impact is situation-specific and has to be analysed in a framework of each particular situation.

Mobile communication market is one of the biggest markets in Lithuania. Based on a smooth development of the sector, the competition is also very tough. Rapidly changing consumer lifestyle and habits determine the steady growth of the demand for mobile services. As the mobile market has already reached the maturity stage of its life-cycle, the prices and services provided are

quite similar. However, the network coverage and signal strength differs. These differences are often more evident in rural areas of Lithuania. As the possibility for customers to change their mobile operator keeping the current phone number forces companies to pay greater attention to customer needs, customer satisfaction becomes a vital factor achieving to retain existing customers; moreover, through the positive word-of-mouth it becomes an important factor leading to new customer attraction. Therefore, the **scientific problem** solved in the article is: what factors affect customer satisfaction with mobile operators' services in Lithuanian rural areas?

The **aim** of this paper is to assess customer satisfaction with mobile operators' services in Lithuanian rural areas determining its antecedents and consequences. Three tasks were set to reach the aim of the article:

- to assess *the level of customer satisfaction* with mobile operators' services in Lithuanian rural areas;
- to determine *the factors affecting customer satisfaction* with mobile operators' services in Lithuanian rural areas;

- to determine *the consequences of customer satisfaction* with mobile operators' services in Lithuanian rural areas.

In order to reach the aim of the article, the questionnaire survey (based on a standard European Customer Satisfaction Index) is provided. Descriptive statistical analysis and structural equation modelling (SEM) using partial least squares (PLS) path modelling methodology were applied for statistical analysis of survey data.

Research results and discussion

To reach the aim of the article, the main part is organized into three chapters: substantiation of the topic; methodology of the research; and research results. The empirical research provides guidelines for mobile operators how to enhance customer satisfaction and loyalty.

1. Substantiation of the topic

According to the data of Communications Regulatory Authority of the Republic of Lithuania (2016), in Lithuania there are three main mobile operators: Omnitel, Tele2, and Bite Lietuva. According to Puras G. (2016), in the beginning of 2015 there were 4184,1 thousand mobile subscribers in Lithuania (144.8 per cent), which is almost twice as many as in a year 2004 (2174 thousands mobile subscribers), and almost

thirteen times as many as in a year 2000 (329 thousands of subscribers). Considering that the amount of mobile subscribers exceeds the population of Lithuania, the market can be called mature.

The services provided by mobile operators can be divided into three main groups. The core services are described by a possibility to send / receive calls and text messages at any time and any place; supplementary services, e.g., internet connection, call forwarding, voice mail, mobile banking, data storage, etc.; changing mobile operator keeping the same phone number. Therefore, the latter kind of services enables customers to defect from their mobile operator at any time without having trouble of changing phone number.

This kind of situation is very convenient for customers who always seek for better prices and services; moreover, it forces mobile operators to keep high service quality and to provide better value for money. Considering the core services provided by mobile operators, the network coverage and signal strength are becoming the most common quality indicators. Network coverage in urban areas of Lithuania is quite well developed, however in rural territories it is still insufficient. Network coverage by operators is provided in Table 1.

Table 1

Network coverage and signal strength

| Mobile operator | Bite Lietuva | | | Omnitel | | | Tele2 | | |
|-------------------------|--------------|----------|--------|---------|----------|--------|--------|----------|--------|
| | Weak | Moderate | Strong | Weak | Moderate | Strong | Weak | Moderate | Strong |
| Lithuanian territory, % | 99-100 | 90-93 | 65-70 | 99-100 | 95-97 | 70-75 | 99-100 | 97-99 | 75-80 |

Source: Communications Regulatory Authority of the Republic of Lithuania (2016)

As it can be seen in Table 1, the network coverage reaches about 100 per cent of the territory of the country; however, in 20-30 per cent of the area signal strength is indicated to be weak. Presumably, the lower coverage and weak signal can be observed in the rural areas of the country.

According to a theory of customer satisfaction, the valuation of all the service-related attributes and features can be performed by applying a customer satisfaction index model. Traditional customer satisfaction index models often contain such variables as customer expectations and perceived quality, which are supposed to affect perceived value; also in addition, company image

can be considered as an antecedent of customer satisfaction. As possible consequences of customer satisfaction in various customer satisfaction indices models can be found such variables as customer loyalty (Ruiz Díaz G., 2017) and customer complaints (Johnson M. D. et al., 2001).

However, the influence of the established factors and their combination is situation-specific. Different factors have to be considered as important according to each situation. Knowing the most important factors affecting customer satisfaction with mobile operators' services in Lithuanian rural areas can help these companies to allocate their investments and key attention areas, thus gaining a competitive advantage in a market.

2. Methodology of the research

For the analysis of customer satisfaction with mobile operators' services in Lithuanian rural areas, standard European Customer Satisfaction Index (Bayol M.-P. et al., 2000) is applied. Latter model contains seven latent variables and is expressed by six structural equations:

- 1) Customer Expectations = $\beta_{20} + \beta_{21} \text{Image} + \zeta_2$;
- 2) Perceived Quality = $\beta_{30} + \beta_{32} \text{Customer Expectations} + \zeta_3$;
- 3) Perceived Value = $\beta_{40} + \beta_{42} \text{Customer Expectations} + \beta_{43} \text{Perceived Quality} + \zeta_4$;
- 4) Customer Satisfaction = $\beta_{50} + \beta_{51} \text{Image} + \beta_{52} \text{Customer Expectations} + \beta_{53} \text{Perceived Quality} + \beta_{54} \text{Perceived Value} + \zeta_5$;
- 5) Customer Complaints = $\beta_{60} + \beta_{65} \text{Customer Satisfaction} + \zeta_6$;
- 6) Customer Loyalty = $\beta_{70} + \beta_{71} \text{Image} + \beta_{75} \text{Customer Satisfaction} + \beta_{76} \text{Customer Complaints} + \zeta_7$.

The chosen measurement model is a reflective one. Each latent variable is measured by corresponding manifest variables, which compose the questionnaire of the research. Hence, questionnaire is comprised of two parts: 1) 21 manifest variables; 2) questions related to respondents' demographic characteristics. During

the research, 10-point evaluation scale was applied for the evaluation of manifest variables.

The research was held in Lithuania in 2016. Only citizens of Lithuania who live in rural areas could participate in the research. Authors applied stratified random sampling method. Since the object of the research relates to Lithuania's level, which is divided into 10 counties, 25 respondents from rural area of each county were surveyed in person. Hence, the total sample size is 250. 56 per cent of female and 44 per cent of male participated in the survey. 30 per cent of the respondents were at the age group of 18-25 years old, 46 per cent – at the age group of 26-35, 24 per cent – at the age group of 36 and more years old.

Descriptive statistical analysis and structural equation modelling (SEM) using partial least squares (PLS) path modelling methodology were applied for statistical analysis. IBM SPSS Statistics V.20 and SmartPLS V.3 (Ringle C.M. et al., 2015) software products were used for the statistical analysis of the research results.

3. Research results

The analysis of the research results includes the evaluation of the reflective measurement model, structural model, testing of research hypotheses and assessment of variables' performance.

As it can be seen from Table 2, all the values of Cronbach's Alpha and Composite Reliability are above the threshold value of 0.7, thus indicating no lack of internal consistency reliability in the measurement model. Moreover, the values of average variance extracted (AVE) are above the threshold value of 0.5, hence the degree of convergent validity is sufficient as well.

For the assessment of individual indicator reliability, indicators' outer loadings are taken into consideration. All of the values of indicators' outer loadings are above the threshold value of 0.7 and statistically significant ($p < 0.05$), indicating that individual indicators are reliable.

For the assessment of discriminant validity in the reflective measurement model, three criteria are applied: Fornell-Larcker criterion, cross-loadings and heterotrait-monotrait ratio of correlations (HTMT^{0.90}). Considering the cross-loadings criteria, all of the indicators' outer loadings with their corresponding latent constructs are greater than their outer loadings with all the remaining constructs. Based on the Fornell-Larcker criterion, each construct's squared root value of average variance extracted is higher than its correlations with all other latent constructs. Considering the HTMT^{0.90} criteria, the values of HTMT are lower than the predefined threshold value of 0.90, substantiating that there is no lack of discriminant validity in the reflective measurement model. Consequently, reflective measurement model is assessed as reliable and valid.

Table 2

Evaluation of reflective measurement model

| Variable | Cronbach's Alpha | Composite Reliability | AVE |
|-------------------|------------------|-----------------------|-------|
| Image | 0.858 | 0.899 | 0.642 |
| Expectations | 0.887 | 0.946 | 0.898 |
| Perceived quality | 0.951 | 0.961 | 0.805 |
| Perceived value | 0.934 | 0.968 | 0.938 |
| Satisfaction | 0.896 | 0.935 | 0.827 |
| Loyalty | 0.862 | 0.935 | 0.878 |

Source: author's elaboration

The evaluation of variance inflation factor (VIF), Cohen f^2 effect size, Stone-Geisser Q^2 , and coefficient of determination (R^2) are made for the assessment of the structural model.

As it can be seen from Table 3 below, the values of coefficient of determination (R^2) are all greater than 25 per cent. The R^2 values of variables satisfaction and loyalty are respectively 84 per cent and 68 per cent, hence indicating that the amount of explained variance of latter variables is large. The R^2 value of variable perceived value is 68 per cent, thus indicating that the amount of explained variance of latter

variable is large as well. The R^2 values of variables expectations and perceived quality are respectively 50 per cent and 39 per cent, hence indicating that the amount of explained variance of latter variables is moderate. Finally, The R^2 value of variable complaints is 25.4 per cent, nevertheless proportion of variance explained by the fit regarding this variable is sufficient.

Table 3

Coefficient of determination

| Variable | R2 |
|-------------------|-------|
| Expectations | 0.495 |
| Perceived quality | 0.393 |
| Perceived value | 0.683 |
| Satisfaction | 0.841 |
| Loyalty | 0.677 |
| Complaints | 0.254 |

Source: author's elaboration

All cross-validated redundancy values (Stone-Geissers' Q^2) for endogenous latent variables are above zero. Consequently, model exhibits predictive relevance. Predictors' variables' variance inflation factor (VIF) is lower than 5; therefore, there is no multicollinearity in the model. The exogenous variable's effect size on the endogenous variables range from small to large, thus exogenous variable is meaningful.

Path coefficients represent the hypothesized relationships among the constructs (see Table 4). As it can be seen, customer expectations have direct, positive and statistically significant influence on perceived quality; nevertheless, expectations have direct, negative and statistically significant influence on perceived value. Image has direct, positive and statistically significant influence on customer expectations and loyalty. Perceived quality has direct, positive and statistically significant influence on customer satisfaction and perceived value. Customer satisfaction has direct, positive and statistically significant influence on customer loyalty and complaints, implying that with the growing satisfaction of customers, their loyalty and perceived complaint handling level also grow.

Perceived value has direct, positive and statistically significant influence on customer satisfaction. Nevertheless, complaints have no statistically significant effect on customer loyalty;

expectations and image have no statistically significant direct effect on customer satisfaction.

Table 4

Path coefficients

| Variables | Path coefficient | Standard Deviation | Confidence Interval (2.5 %) | Confidence Interval (97.5 %) | p value |
|------------------------------|------------------|--------------------|-----------------------------|------------------------------|---------|
| Complaints -> Loyalty | -0.010 | 0.071 | -0.143 | 0.139 | 0.887 |
| Expectations -> Quality | 0.627 | 0.081 | 0.444 | 0.754 | 0.000 |
| Expectations -> Satisfaction | -0.053 | 0.083 | -0.226 | 0.101 | 0.522 |
| Expectations -> Value | -0.246 | 0.068 | -0.391 | -0.135 | 0.000 |
| Image -> Expectations | 0.704 | 0.062 | 0.575 | 0.812 | 0.000 |
| Image -> Loyalty | 0.222 | 0.107 | 0.040 | 0.440 | 0.038 |
| Image -> Satisfaction | -0.023 | 0.099 | -0.202 | 0.195 | 0.820 |
| Quality -> Satisfaction | 0.528 | 0.123 | 0.321 | 0.832 | 0.000 |
| Quality -> Value | 0.958 | 0.061 | 0.850 | 1.074 | 0.000 |
| Satisfaction -> Complaints | 0.504 | 0.089 | 0.323 | 0.671 | 0.000 |
| Satisfaction -> Loyalty | 0.664 | 0.131 | 0.406 | 0.887 | 0.000 |
| Value -> Satisfaction | 0.483 | 0.121 | 0.163 | 0.656 | 0.000 |

Source: author's elaboration

Table 5

Total Effects

| Variables | Total Effect | Standard Deviation | Confidence Interval (2.5 %) | Confidence Interval (97.5 %) | p value |
|------------------------------|--------------|--------------------|-----------------------------|------------------------------|---------|
| Complaints -> Loyalty | -0.010 | 0.071 | -0.143 | 0.139 | 0.887 |
| Expectations -> Complaints | 0.227 | 0.074 | 0.096 | 0.381 | 0.002 |
| Expectations -> Loyalty | 0.296 | 0.096 | 0.125 | 0.496 | 0.002 |
| Expectations -> Quality | 0.627 | 0.081 | 0.444 | 0.754 | 0.000 |
| Expectations -> Satisfaction | 0.449 | 0.116 | 0.218 | 0.674 | 0.000 |
| Expectations -> Value | 0.355 | 0.106 | 0.135 | 0.549 | 0.001 |
| Image -> Complaints | 0.148 | 0.061 | 0.047 | 0.280 | 0.015 |
| Image -> Expectations | 0.704 | 0.062 | 0.575 | 0.812 | 0.000 |
| Image -> Loyalty | 0.416 | 0.103 | 0.210 | 0.613 | 0.000 |
| Image -> Quality | 0.441 | 0.089 | 0.271 | 0.599 | 0.000 |
| Image -> Satisfaction | 0.294 | 0.098 | 0.108 | 0.496 | 0.003 |
| Image -> Value | 0.250 | 0.090 | 0.080 | 0.424 | 0.006 |
| Quality -> Complaints | 0.499 | 0.102 | 0.291 | 0.707 | 0.000 |
| Quality -> Loyalty | 0.653 | 0.134 | 0.374 | 0.881 | 0.000 |
| Quality -> Satisfaction | 0.991 | 0.074 | 0.830 | 1.123 | 0.000 |
| Quality -> Value | 0.958 | 0.061 | 0.850 | 1.074 | 0.000 |
| Satisfaction -> Complaints | 0.504 | 0.089 | 0.323 | 0.671 | 0.000 |
| Satisfaction -> Loyalty | 0.659 | 0.118 | 0.413 | 0.855 | 0.000 |
| Value -> Complaints | 0.243 | 0.074 | 0.079 | 0.367 | 0.001 |
| Value -> Loyalty | 0.318 | 0.073 | 0.135 | 0.434 | 0.000 |
| Value -> Satisfaction | 0.483 | 0.121 | 0.163 | 0.656 | 0.000 |

Source: author's elaboration

Despite the fact that expectations and image have no statistically significant direct effect on

customer satisfaction, the analysis of the total effects (the sum of direct and indirect effects)

reveals that the only one statistically non-significant relationship is the effect of complaints on customer loyalty (Table 5), implying that perceived complaint handling level does not affect customer loyalty. All of the remaining total effects are positive and statistically significant. Hence, customer expectations have positive and statistically significant influence on customer perceived quality, perceived value, satisfaction, loyalty, and complaints. Image of mobile operators has positive and statistically significant influence on customer expectations, perceived quality, perceived value, satisfaction, loyalty, and complaints. Perceived service quality has positive and statistically significant influence on customer perceived value, satisfaction, loyalty, and complaints. Perceived service value has positive and statistically significant influence on customer satisfaction, loyalty, and complaints. Customer satisfaction has positive and statistically significant influence on customer loyalty and complaints.

Hair J.F. et al. (2013) suggest that the total effect for the specific endogenous construct represents the importance of the variable, while the average values of the latent variable scores rescaled to a range of zero and 100 represents the performance of the variable. Hence, the performance values of the variables are presented in Table 6 below.

Table 6

Performance of variables

| Variable | Performance |
|-------------------|--------------------|
| Image | 69.129 |
| Expectations | 70.391 |
| Perceived quality | 65.967 |
| Perceived value | 68.592 |
| Satisfaction | 69.313 |
| Loyalty | 73.262 |
| Complaints | 61.167 |

Source: author's elaboration

As it can be seen, the level of customer satisfaction with mobile operators' services in Lithuanian rural areas is moderate. When

analysing the performance of the variables that influence customer satisfaction, it could be stated that the level of customer expectations and image of mobile operators are relatively high, while the performance of customer perceived quality and perceived value are relatively low.

When compared to the total effects, it could be stated that the most important variable for customer satisfaction – perceived quality, has the lowest performance, hence latter variable is the one to concentrate to in order to enhance customer satisfaction with mobile operators' services in Lithuanian rural areas.

Moreover, perceived value has moderate influence on customer satisfaction (lower than perceived quality) and relatively low performance (higher than perceived quality), thus latter variable becomes the second one that must be managed in order to enhance customer satisfaction with mobile operators' services in Lithuanian rural areas.

Nevertheless, customer expectations have moderate influence on customer satisfaction and relatively high performance, hence it could be stated that customer expectations are managed properly and do not need improvement in order to enhance customer satisfaction with mobile operators' services in Lithuanian rural areas. Despite this, image of the mobile operators has relatively high performance, but low influence on customer satisfaction, thus it does not mean that investments are not required, but they should constitute smaller percentage of total investments allocated to satisfy customers.

The level of customer loyalty with mobile operators' services in Lithuanian rural areas is high. When analysing the performance of the variables that influence customer loyalty, it could be stated that customer satisfaction and perceived quality are the variables that have the highest influence on customer loyalty, but again perceived quality has relatively low performance, hence latter variable is the one to concentrate to in order to enhance customer loyalty. Moreover,

improving perceived quality would result in enhanced satisfaction as well, thus latter variable becomes of the first importance in order to enhance customer satisfaction and loyalty with mobile operators' services in Lithuanian rural areas.

Customer expectations have low influence on customer loyalty and relatively high performance, hence it substantiates the recommendation that customer expectations are managed properly and do not need improvement in order to enhance customer satisfaction and loyalty with mobile operators' services in Lithuanian rural areas.

Image of the mobile operators has moderate influence on customer loyalty and relatively high performance. Bearing in mind that when seeking to improve customer satisfaction image should constitute smaller percentage of total investments allocated to satisfy customers as it has low influence on satisfaction, it could be stated that when the level of satisfaction will be improved, then image of mobile operators can constitute a bigger percentage of total investments allocated to enhance customer loyalty. As the research results reveal, improving image is not of the first priority.

Perceived value has moderate influence on customer loyalty and relatively low performance, thus latter variable must be managed in order to enhance customer loyalty with mobile operators' services in Lithuanian rural areas.

Finally, as complaints (perceived complaint handling level) do not influence customer loyalty, the lowest performance of latter variable makes no difference; hence complaints do not require improvement in order to enhance customer loyalty.

Conclusions, proposals, recommendations

1) In the information age, new information and communication technologies in everyday life, customers require best services especially regarding communication technologies. Consequently, mobile operators' services are

expected to be of the best quality. Despite this, the analysis of the research results revealed that the level of customer satisfaction with mobile operators' services in Lithuanian rural areas is moderate.

2) In order to enhance customer satisfaction with mobile operators' services in Lithuanian rural areas, perceived quality is the most important and the first variable to concentrate to in order to enhance customer satisfaction with mobile operators' services. Perceived value is the second variable that must be managed in order to enhance customer satisfaction with mobile operators' services in Lithuanian rural areas. Customer expectations are managed properly and do not need improvement in order to enhance customer satisfaction with mobile operators' services in Lithuanian rural areas. Despite this, investments into the image of mobile operators should constitute smaller percentage of total investments allocated to satisfy customers.

3) The level of customer loyalty with mobile operators' services in Lithuanian rural areas is high. Nevertheless, improving perceived quality would result in enhanced satisfaction and loyalty, thus latter variable is substantiated to be of the first importance in order to enhance customer satisfaction as well as loyalty with mobile operators' services in Lithuanian rural areas. Perceived value is the second variable that must be managed in order to enhance customer loyalty with mobile operators' services in Lithuanian rural areas. Regarding customer loyalty, customer expectations are again substantiated to be managed properly and do not need improvement in order to enhance customer satisfaction and / or loyalty with mobile operators' services in Lithuanian rural areas. As the research results reveal, improving image is not of the first priority, hence when the level of satisfaction will be improved, then a bigger percentage of total investments

allocated to enhance customer loyalty can be spend on improving image of mobile operators. Finally, complaints do not require improvement in order to enhance customer loyalty.

- 4) By following the provided recommendations mobile operators can improve customer satisfaction and loyalty with mobile operators' services in Lithuanian rural areas by investing into variables that are important, but of low

performance, instead of allocating investments into variables that do not affect customer satisfaction and loyalty or are already of high performance. Hence, these recommendations may result in the balance between the importance and performance of factors affecting customer satisfaction and loyalty with mobile operators' services in Lithuanian rural areas.

Bibliography

1. Bayol, M.-P., Foye, A., Tellier, C., Tenenhaus, M. (2000). Use of PLS Path Modelling to estimate the European Consumer Satisfaction Index (ECSI) model. *Statistica Applicata*, Volume 12, No. 3, pp. 361-375.
2. Communications Regulatory Authority of the Republic of Lithuania (2016). Retrieved: <http://www.rrt.lt>.
3. Chu-Mei, L., Chien-Jung, H., Mei-Liang, C. (2014). Relational Benefits, Customer Satisfaction, and Customer Loyalty in Chain Store Restaurants. *International Journal Of Organizational Innovation*, Volume 7, No. 1, pp. 46-56.
4. Hair, J. F., Ringle, C. M., Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, Volume 46, No. 1-2, pp. 1-12.
5. Johnson, M. D., Gustafsson, A., Andreassen, T. W., Lervik, L., Cha, J. (2001). The Evolution and Future of National Customer Satisfaction Index Models. *Journal of Economic Psychology*, Volume 22, pp. 217-245.
6. Puras G. (2016). Development of Lithuania's communications sector 2000-2015: pres-accession challenges and current achievements. Retrieved: http://www.rrt.lt/lt/pranesimai_296/2016.html.
7. Ringle, C.M., Wende, S., Becker, J.-M. (2015). SmartPLS 3. Bonningstedt: SmartPLS. Retrieved: <http://www.smartpls.com>. Access: 14.05.2016
8. Ruiz Díaz, G. (2017). The influence of satisfaction on customer retention in mobile phone market. *Journal of Retailing and Consumer Services*, Volume 36, pp. 75-85.

REAL ESTATE DEVELOPERS' POSSIBILITIES OF INCREASING COMPETITIVENESS IN THE GLOBAL ENVIRONMENT CONDITIONS

Inara Repsa¹, MBA; Rosita Zvirgzdina², Dr.oec.

Abstract. In the era of globalization, the efficiency of production and demand is the sole criterion of circulated goods competitiveness. General globalization involved in the international circulation such goods as real estate, the production of which in the essence is construction.

This study aims to look at real estate developers' opportunities to improve their competitiveness in a globalizing world. In the study, globalization and competitiveness will be characterized in the context of the real estate market globalization, as well as the authors will give insight into the real estate market development and examine housing fund renovation in Latvia. In the final section, the authors will discuss and set out the main conclusions of real estate developers' competitiveness promotion in the global environment.

Key words: real estate market, competitiveness, globalization.

JEL code: F63

Introduction

Globalization became the modern world system, which specifies the development of civilization. This process cannot be suspended or revoked, even with all the strengths and weaknesses; it is a historical fact. General globalization involved in the international circulation such immovable product as real estate, which became the object of international investment.

Some authors (Vassilieva and Glebova, 2010) indicate that in Latvia external environment is made up of public policy, including investment policy, which is one of the external factors that seriously affect the company's competitiveness improvement opportunities.

To increase the competitiveness in Latvia, real estate developers use amendments to the Immigration Law adopted on July 1 2010 in the framework of the investors' programme, which allows foreigners to obtain a temporary residence permit in Latvia for the investments in the real estate of the Republic of Latvia with this more involving Latvian real estate market in the globalization process.

The aim of this research is to look at real estate developers' opportunities to improve their competitiveness in a globalizing world. To achieve the aim, the following tasks are set:

1) to describe the real estate market in the circumstances of competitiveness of globalization;

2) to take an insight into the real estate development in Latvia;

3) to explore the housing fund renovation possibilities in Latvia.

The study is based on the data and reports of the State Central Statistical Bureau, Office of Citizenship and Migration Affairs (OCMA), overviews provided by the State Land Service (SLS). The following research methods are used: monographic, analysis and synthesis, graphic and logical constructive method.

The real estate market competitiveness in a globalizing world

Competitiveness is one of the most important characteristic categories in goods and services markets as well as one of the most important factors in business affecting any operating companies in the economic sector (Fedotova, Geipele, 2009).

There are many different explanations and definitions of competitiveness, and according to Ketel, there may be disagreement and confusion in the research of this phenomenon, in the absence of a common language, a clear understanding of what is competitiveness. He also notes that the conceptual definition of the term of competitiveness cannot be true or false in the absolute sense; its compliance can be considered in relation with specific issues of research or policy. A common definition of

¹Tel.: +371 25495472. E-mail address: inara.repsa@gmail.com

²Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

competitiveness thus also reflects the common view of what will be used in the analysis (Ketel, 2006).

Competition, as competition between producers of goods, providers of the possibility of increased productivity and profits in the relevant market, is viewed at different levels - business, industry, regional, national level.

One of the worldwide-recognized scientists, the Nobel Prize winner in economics Krugman, P. believes that it is only possible to speak about the company's competitiveness, because at national level discussions on competitiveness can lead to pointless spending money, increasing corruption, besides public administration employees may lack expertise in providing effective policy. Krugman, P. argues that the concept of region's competitiveness is nothing more than just a competitiveness of enterprises in the region (Krugman, 1994). Krugman, P. believes that areas do not compete with each other directly, but are competing against other companies located within certain areas, thus seeing more usefulness to study the competitiveness of enterprises, rather than national competitiveness (Krugman, 1996).

Despite the fact that competition and competitiveness issue is widely discussed in scientific researches, Porter, M., the founder of the theory of competitiveness, notes that "competitiveness remains a concept that is not well understood, despite widespread acceptance of its importance" (Porter, 2004).

There is currently no single "competitiveness" definition. The main factors that allow diverse interpretation of that concept must be assessed by the researchers from different views, as well as the fact that the manufacturers are considered individual companies, sectors or the state economy as a whole.

Competitiveness is a relative concept, as a product or service that successfully competes in one market, in another market will not be competitive. This creates a need to set out the

competitiveness in the internal and external market.

Consequently, in the overall formation of the competitiveness concepts, it is necessary to take into account all these phenomena parties. However, considering the experience of other countries, international competition is based on internal market competitiveness (Zaharov, Zokin, 2004).

By contrast, in the circumstances of globalization, business efficiency and uttering demand for the product is the sole criterion of competitiveness. Competitiveness is one of the most important categories characterizing goods and services market, as well as one of the most important factors in business affecting any economic sector in the business, defining the company's own competitiveness, including companies operating in the real estate market.

The real estate market development was traditionally viewed separately from the processes of globalization. It is set due to the features of the real estate - it is impossible to move it and sell abroad.

Modern communication technologies, the Internet, telecommunications unified claims on real estate objects; there were discovered similar trends in various state housing market development speeds.

According to expert assessment, real estate globalization takes place in the following directions:

- investment migration related to the real estate market opening for transnational investors (investors leave overheated markets);
- foreign buyers entering the market (in all countries);
- private investors enter the market (through real estate investment funds);
- rapid exchange of experiences, management, standards, technologies from developed markets to development (universality of scientific and technical ideas and standards);

¹Tel.: +371 25495472. E-mail address: inara.repsa@gmail.com

²Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

- globalization ideology in architecture and construction (the same architects, engineers, designers design, build, decorate the buildings and manage them over all continents) (Brett, Schmitz, 2009).

These factors seriously affect national real estate markets.

The process of globalization, by interaction of different material markets, with a common raw material base use, enabled the establishment of relations as well as production, trade and financial inter-networking. Consequently, all of the processes that take place in the global economy affect each national market, including the market of Latvia.

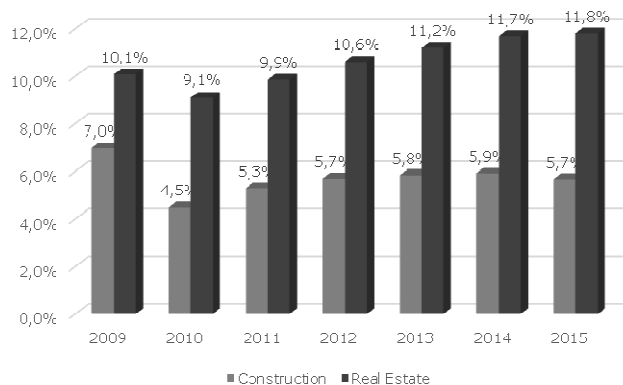
The real estate market growth takes an important place in any country's economic development. The real estate market development is also dependent on the construction industry development (Geipele, 2014), since real estate's production is essentially construction. Latvian construction industry's competitiveness largely depends on the accessibility of raw materials that are produced in other countries.

By contrast, construction is one of the basic sectors of the economy. Development of this sector means a lot to the country and society, as it determines the availability of housing fund in the country. Ensuring access to housing is one of the most important tasks of the state social policy. It is necessary to carry out regular monitoring of the housing market situation for the timely adoption of the decision, which focuses on the development of the market.

Insight into the real estate market development in Latvia

Taking into account the background, the real estate and construction sector have to be seen in the interaction. By making a small insight into the real estate market development in Latvia, the author concludes that after calculation of macroeconomic development indicators of Latvia both industries take an important place.

Construction and real estate sector's proportion to the Gross Domestic Product (GDP) is reflected in Figure 1. In 2015, the total sector proportion accounted for 17.5 % of GDP, which is almost 1/5 of the total national GDP.

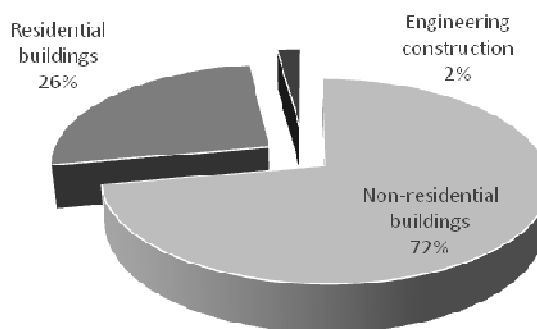


Source: authors' construction based on the CBS data

Figure 1. Construction and real estate sector proportion to GDP (at current prices)

As mentioned above, the availability of housing fund is one of the most important tasks of the national social policy.

The State Land Service's construction report for 2015 provides information on the construction division in the Republic of Latvia and its administrative areas of their main ways of use. According to the information provided, the housing fund makes up more than 1/4 (26 %) of the total number of buildings (Figure 2).



Source: authors' construction based on the SLS data

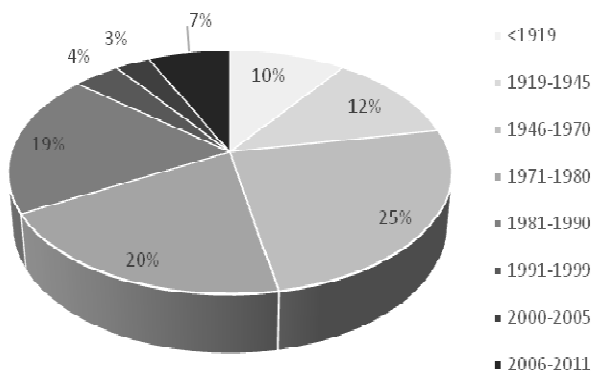
Figure 2. Building distribution by the use in the Republic of Latvia 01/01/2016 (The data from cadastral information system; % of the total number of buildings)

By contrast, the housing structure in Latvia is presented in Figure 3 and shows that the vast majority (25 %) of Latvian residential buildings were built in the period from 1946 to 1970, followed by residential buildings built in the period from 1971 to 1980 with 20 % share and

¹Tel.: +371 25495472. E-mail address: inara.repsa@gmail.com

²Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

19 % of residential buildings built in the period from 1981 to 1990. Most (86 %) of residential buildings in Latvia were built in the period up to 1990.



Source: authors' construction based on Brick&Smiles property brokers' data

Figure 3. Residential building age structure in Latvia (%)

Only 10 % of residential buildings have been built from 2000 to 2011, which means that the housing fund in Latvia is changing and evolving relatively slowly, and the existing dwelling is getting older.

According to the Cabinet Regulations No.907 "Regulations Regarding the Survey, Technical Servicing, Current Repairs and Minimal Requirements for Energy Efficiency of the Residential House" of 28 September 2010 is specified an average lifetime for the mass production residential buildings. Depending on the type of the project series, it is 50 to 70 years, which means that for some of these buildings lifetime has already expired or will expire soon.

This finding calls for national policies to find ways to improve and develop the housing market, particularly - new projects in construction due to the structure age of apartment houses because the issue of the renewal of housing fund each year becomes more urgent.

Possibilities of housing fund reconstruction in Latvia

The housing fund reconstruction is possible both by constructing new residential buildings and renovating the existing ones. By contrast,

the real estate market development requires investment, including foreign investment.

Keynes, J.M. believes that the state should stimulate investment, including foreign. He proved that the state expenditure raise would be compensated by the new tax payments, which would form under the influence of the production scale and employment growth (Olevskis, 2000).

In order to increase the attractiveness of the real estate market of Latvia to foreign investors, it is necessary to carry out package of foreign investment attraction measures, including the regulatory framework to promote the attractiveness.

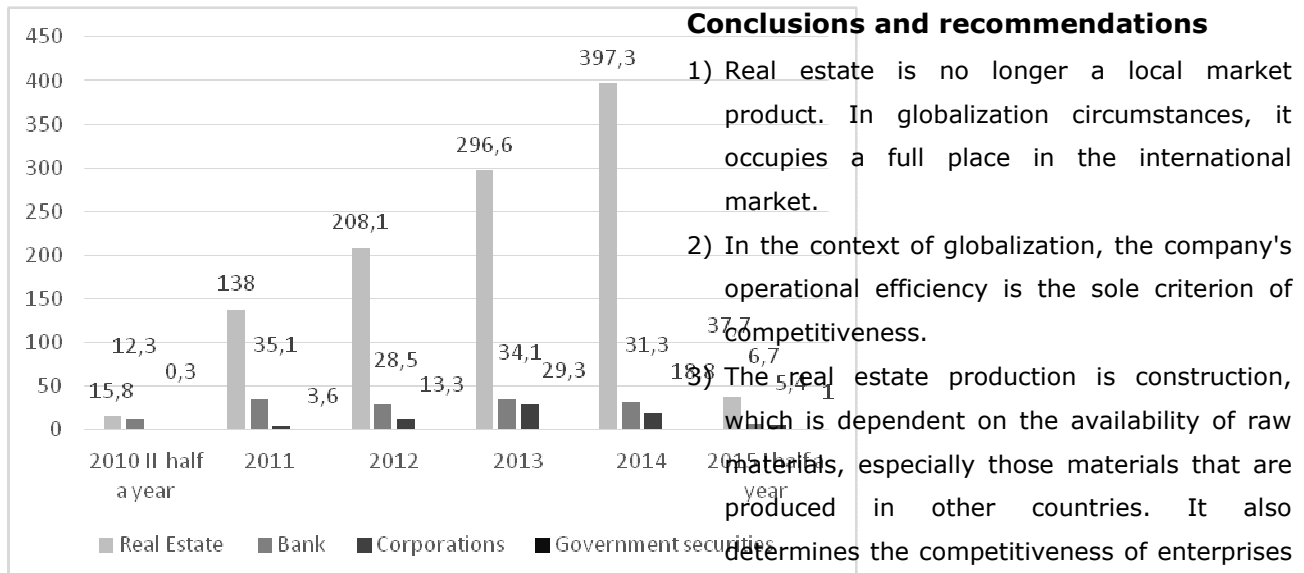
In the framework of the Investor support program on 1 July 1 2010 were adopted amendments to the Section 23 of the Immigration Law, which allow foreigners to obtain temporary residence permit (TRP) in Latvia by investments in economy of Latvia, including investments in the real estate in the Republic of Latvia.

Foreign state investments in the most affect new housing projects, mostly apartment houses. That is due to aliens who bought new projects, both in terms of TRP and without them, were completed new projects started during the crisis (Aliens effect ..., 2014).

In turn, Porter, M. emphasizes that competitiveness can also affect state policy change (Porter, 1990). During these years, the Immigration Law was amended several times, specifying the conditions for issuing temporary residence permits to foreign investors. Changes in the Law conditions also changed the amount of investment, especially in real estate investments, which are seen in Figure 4.

¹Tel.: +371 25495472. E-mail address: inara.repsa@gmail.com

²Tel.: +371 26408253. E-mail address: Rosita@turiba.lv



Source: authors' construction based on OCMA data

Figure 4. Investment volume in the framework of TRP programme (mil EUR)

These amendments to the Immigration Law from the public and market participants are evaluated differently. A part of the real estate developers believe that this programme is a "Success story" that has allowed developers not to go bankrupt, for those which had launched housing projects, but their trade due to the 2008 crisis stopped. Thanks to this programme, not only the already started projects were completed, but also new ones were developed. The opposite view is represented by the arguments that the programme was designed as a short-term economic support programme; from the economic nature, it is not sustainable.

Conversely, without the economic dimension in society it is widely discussed about social and political side effects. It voiced the opinion that the programme must be terminated completely, not only by building "barriers" or by limiting buyers.

Robust enterprise driven competitiveness increase can only be ensured in long-term and by continuously improving competitiveness determinants (factors) (Gabibova, 2015). Taking into account that construction is a long process, continuous legislative amendments do not allow the real estate industry to build a sustainable concept of competitive improvement.

Conclusions and recommendations

- 1) Real estate is no longer a local market product. In globalization circumstances, it occupies a full place in the international market.
- 2) In the context of globalization, the company's operational efficiency is the sole criterion of competitiveness.
- 3) The real estate production is construction, which is dependent on the availability of raw materials, especially those materials that are produced in other countries. It also determines the competitiveness of enterprises in the real estate sector.
- 4) The development of the real estate and construction industry is very important to the country; these sectors' total proportion of GDP on average over the years is almost 1/5 of the total national GDP.
- 5) The real estate and construction industry's development is also important for the public, because it determines the availability of housing fund in the country, which is one of the most important tasks of the national social policy.
- 6) 86 % of the Latvia's housing fund was built before 1990 and only 14 % of apartment houses have been built between 1990 and 2011, which means that the housing fund in Latvia is changing and evolving relatively slowly, and the existing dwelling is getting old.
- 7) One of the housing fund renewal options is attraction of investment. In the framework of Investor support programme, in Latvia in 2010 there were adopted amendments to the Immigration Law, which allowed foreigners to obtain temporary residence permits for the investments in Latvian real estate. The amendments to the law successfully operated until 2014, when next amendments were adopted to the Law.
- 8) Continually legislative amendments do not allow the real estate industry to build a sustainable competitive improvement concept.

¹Tel.: +371 25495472. E-mail address: inara.repsa@gmail.com

²Tel.: +371 26408253. E-mail address: Rosita@turiba.lv

- 9) These conclusions encourage finding ways in public policy to improve and develop the legislation as well as the housing market, particularly - in new project construction because of apartment houses' age structure.
- 10) The legislator should make gradual changes in legislation related to the real estate development area, allowing entrepreneurs to plan their work in the long-term.

current techniques to attract foreign investment in real estate development, the author believes that this study should be continued and more comprehensive analysis must be carried out to determine how much contribution temporary residence permits' issuing provides for investment in real estate business to increase the competitiveness of the national economy as a whole.

Considering the real estate globalization process as well as the public debate on the

Bibliography

1. Arvalstnieku ietekme uz nekustama ipasauma tirgu majoklu segmenta (Foreigners impact on the real estate market housing segment) 2011.g. – 2014.g. I–III ceturksnis / VZD 2014/2 Viewed on: 04.01.2017. Available: <http://www.vzd.gov.lv/>
2. Brick&Smiles property brokers, Pardosanas tirgus parskats (Brick & Smiles property brokers, sales market report) 05.10.2012. Viewed on: 04.01.2017. Available: <http://www.bands.lv>
3. Centrala statistikas parvalde (Central Bureau of Statistics - CBS) Viewed on: 09.01.2017. Available: <http://www.csb.gov.lv/>.
4. Deborah, L. Brett, Adrienne Schmitz. (2009). Real Estate Market Analysis: Methods and Case Studies. Washington, D.C. : Urban Land Institute p. 271.
5. Fedotova, K., Geipele, I. (2009). Konkuretspejas paaugstinanas iespējas mainīgos vides apstākļos (Possibilities to Increase Competitiveness in Changing Environmental Conditions) / RTU IEVF Ekonomikas un uzņēmējdarbības zinātniska konference (SCEE'2009), 2009, Latvija, Rīga: RTU Izdevniecība, 74 p.
6. Gabibova M. (2015). Пути повышения конкурентоспособности предприятия (Ways to Improve the Competitiveness of Enterprise), Актуальные вопросы экономики и управления: III Междунар. науч. конф., p. 87.
7. Geipele, S. (2014). Nekustama ipasuma tirgus attīstības vadīšanas sistēma Latvija (The Real Estate Market Development Management System in Latvia) - Rīga: RTU Izdevniecība, p. 30 pp.
8. Informatīvais ziņojums par Imigrācijas likuma 23.pantā pirmās daļas 3., 28., 29., 30. un 31.punkta paredzēto noteikumu īstenošanas gaitu un rezultātiem (Informative Report about the Immigration Law...) 2015 Viewed on: 09.01.2017. Available: <http://titania.saeima.lv/>
9. Ketels, C. H. M. (2006). Michael Porter's Competitiveness Framework-Recent Learnings and New Research Priorities. Journal of Industry, Competition & Trade, Vol. 6, pp.115–136.
10. Krugman, P.R. (1994) "Competitiveness: a Dangerous Obsession", Foreign Affairs, Vol. 73(2), pp.28-44.
11. Krugman P.R. (1996). Making sense of the competitiveness debate, Oxford Review of Economic Policy, Vol. 12, No.3, pp.17-25.
12. MK 28.09.2007. noteikumi Nr.907 "Noteikumi par dzīvojamās mājas apsekosanu, tehnisko apkopi, kartejo remontu un energoefektivitātes minimalajam prasībam"// Latvijas Vestnesis, 156 (4348), 01.10.2010.
13. Olevskis G. (2000) Starptautiska ekonomika (International Economics), Jana Rozes apgads, 188 lpp.
14. Pilsonības un migrācijas lietu pārvalde (The Office of Citizenship and Migration Affairs – OCMA) (2016). Viewed on: 27.12.2016. Available: <http://www.pmlp.gov.lv/>
15. Porter M. (1990) The Competitive Advantage of Nations. –New York: The Free Press. A Division of Macmillan, Inc. p.27.
16. Porter M.E. (2004). Building the Microeconomic Foundations of Prosperity: Findings from the Business Competitiveness Index, In the Global Competitiveness Report 2003-2004, p. 30.
17. Valsts zemes dienests (State Land Service - SLS), Latvijas Republikas būvju pārskats (Latvian Republic building review) 2015. Viewed on: 04.01.2017. Available: <http://www.vzd.gov.lv/>
18. Vasiljeva, L., Glebova, A. (2010). Razosanas uzņēmumu konkuretspejas nodrošināšana Latvija (Ensuring Competitiveness to Production Companies in Latvia). Ekonomiskie pētījumi uzņēmējdarbībā. Nr. 8, p. 52.
19. Zaharov A.N., Zokin A.A. (2004). Конкурентоспособность предприятия: сущность, методы оценки и механизмы увеличения (The Competitiveness of the Enterprise: Essence, Evaluation Methods and Mechanisms in Increase) Viewed on: 20.12.2016. Available: http://www.logistics.ru/scm/9/2/i20_64.htm

FOOD SECURITY IN THE EUROPEAN UNION: CASE STUDY OF LAMB MARKET**Tomasz Rokicki¹**, PhD¹Warsaw University of Life Sciences

Abstract. The concept of food security emerged in the second half of the twentieth century and has been subject to evolution. At the beginning of the twenty-first century, it meant the availability of food in terms of quantity, quality, both economic and social. The aim of the paper is to provide food security in the lamb market in the EU, where there are shortages. The research period covered the time from 2005 to 2013. The sources of the materials include literature and data of FAPA and EUROSTAT. The study used descriptive, tabular and graphical methods and the Pearson linear correlation coefficient. It was found that the production of lamb meat in 2005-2013 decreased as volume of import and consumption per person decreased, while the share of self-supply increased. Security in quantitative terms, however, has improved. There was a significant positive correlation between the volume of production of lamb and beef and pork consumption (consumption of these meats fell). The consumption of lamb was affected by the economic situation in the EU and prosperity of its citizens. Similar situation was observed in the case of lamb imports. Heavy lamb prices rose sharply and found a strong significant negative correlation with the volume of production of this type of meat in the EU, the consumption of lamb per person and imports of the lamb. Lamb has become a rare product; hence its price has increased. Lamb ensures food security, because it has valuable nutritional properties and health benefits.

Key words: food security, EU, lamb meat, meat consumption.

JEL code: E21, F15, Q02

Introduction

For centuries, food security has been understood as a degree of self-sufficiency of the country, i.e. its ability to meet the nutritional needs on its own in the long term. Along with the general globalisation, free trade and international specialisation, access to food has become easier. Therefore, rich countries are able to purchase almost any amount of food on the international market (Wilkin, 2009). The issue of food security was tackled already in 1798 by Th. R. Malthus, in his static theory of resources, according to which growing human population, combined with a constant supply of land, could lead to a decline in labour productivity in agriculture. Food production will not be able to keep the pace with population growth, resulting in starvation, and consequently, decrease in the human population to a level ensuring its nutrition (Landreth and Colander, 2005). However, Malthus underestimated the role of technological progress in agricultural production. The experience of various countries already in the early nineteenth century showed that agricultural production could increase rapidly. On the other hand, human population did not grow as quickly as expected (List and Colwell, 1856). In the interwar period

and in the first several years after World War II, we witnessed a revival of his theory, i.e. the so-called neo-Malthusianism. The reason for the revival was the excessive growth of population in colonial and post-colonial countries. There were fears for the survival of these societies and the world in general. One of the ways of dealing with the existing threat was to allocate aid to developing countries in order to support their efforts aimed at weakening the dynamics of population growth (Wicksell, 1951; Notestein, 1953; Thompson and Lewis, 1965). Ehrlich (1968) assumed that within fifteen years after the publication of his book, a demographic disaster would result in global famine. In another publication, the author predicted the exhaustion of the nutritional capacity of the Earth within the next 100 years (Meadows et al., 1972). In a report prepared for the US President, the authors stated that with the current trends in its development, the world in 2000 would be more populated and more polluted than the world at the time of the report (Barney, 1982). There were also theories which defied neo-Malthusianism. The Boserup model was based on the assumption that population growth contributed to advancement in economy and

¹ Corresponding author. E-mail address: tomasz_rokicki@sggw.pl

civilisation. In this model, food production is growing faster than population, and this is due to innovation and technological progress (Boserup, 1981). In accordance with the ultimate resource theory, supply and demand operate on the principle of a natural mechanism for preventing crisis in the availability of natural resources. The reduction in the renewable resources of the raw material increases its prices, which in turn contributes to the search for new resources of the raw material or innovation aimed at replacing the raw material with something else (Simon, 1998).

The first definition of food security was formulated in 1974, at the World Food Conference. Food security was defined as the state of the economy where the needs, deemed socially acceptable, of all people could be met (Oleszko, 2006). In 1981, A. K. Sen (1981) expanded this concept and stated that although food might be widely available, not everyone was able to buy it. Accordingly, in 1983, another definition was formulated; this time it was presented by FAO (Food and Agriculture Organisation of the United Nations). According to the definition, food security involved "ensuring that all people at all times have both physical and economic access to the basic food that they need" (Maxwell, 1996). In the 1990, attention was drawn to another aspect of food security, namely the aspect related to the nutritional value of food. The new FAO food security definition of 1998 drew attention to such additional aspects as food safety in terms of health, content of the optimal amount of nutrients, catering for nutritional needs and preferences, thus allowing for an active and healthy lifestyle (Mechlem, 2004). In 2009, the definition was supplemented with social aspects. The authors of the definition stated that the prevailing cultural and social standards could prevent people's access to food, notwithstanding the fulfilment of the condition of economic availability (Pinstrup-Andersen, 2009).

Thus, the concept of food security is multifaceted and constantly evolving.

In order to increase food supply, some countries import food from abroad. This contributes to ensuring balance on the internal (domestic) market. Thus, the supply of agricultural products is affected by the production capacity of the country and the foreign trade policy applied by it. In order to reduce their deficit in the balance of payments, many famine-stricken countries export large quantities of their agricultural products. However, such measures lead to the lack of self-sufficiency of the internal market in terms of food (Poczta et al., 2008). With its economically developed member states, the European Union (EU) should not be facing any food security problems. With regard to specific products, Common Market operates within the framework of the EU. This market provides uniform competitive conditions for all participants. In addition, the products offered on the market should meet certain quality standards (Szczepaniak, 2005). To a greater or lesser degree, the individual markets are subject to an active EU intervention policy. Such direct and indirect support is aimed at providing market operators with conditions for operating and competing in domestic and foreign markets (Nosecka et al., 2011). Due to the recent economic crisis (2009), many countries have decided to achieve self-sufficiency in the production of basic foods, even if they lack comparative advantages in this respect. However, such measures are only justifiable in the case of strategic products (Grochowska et al., 2013). Self-sufficiency differs from the concept of food security. Self-sufficiency is related to the domestic economy and the optimum response to the demand for selected products. On the other hand, food security relates directly to human nutritional needs (Malysz, 1998; Rokicki, 2016). In terms of agricultural production aspect, the European Union is mostly self-sufficient, although deficiencies have been observed in the case of

durum wheat, rye, corn, sugar, rape, soybean, rapeseed and sunflower oils, fruit, mutton and goat meat (Baer-Nawrocka, 2014). The sheep meat market is the only market without self-sufficiency. Despite the low levels of consumption, amounting to less than 3 kg per capita, the production of lamb within the Community covered only 80 % of the reported demand. Imports of substantial quantities of lamb proved necessary (Rokicki, 2005; Rokicki, 2016).

Many EU regulations contain provisions on the common organisation of the sheep meat markets. The current legislation in this regard is included in the provisions of the Regulation of the European Parliament and of the Council (EU) No 1308/2013 of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulation (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007. The common organisation of the sheep and goat meat market consists of the internal market system and trading system (Rozporządzenie ..., 2013).

Intervention on the market in sheep meat may be launched in case of difficult market conditions. Usually, the reason is a decline in market prices for sheep meat in the EU and the region below 90 % of the seasonally adjusted-base price or the reference price drop below 70 % of the basic price. The decision on the launch of this instrument is the responsibility of the European Commission. In addition, it is possible to support private storage, but only in the case of carcasses and half-carcasses of young lambs, i.e. up to 1 year old. Subsidies are paid to producers storing meat at their own expense, for a predetermined time and under specified conditions. Storage is carried out in licensed cold storage facilities for at least 3 months. The amount of subsidy is determined by the Commission of the EU (Klepacki and Rokicki, 2006).

Materials and methods

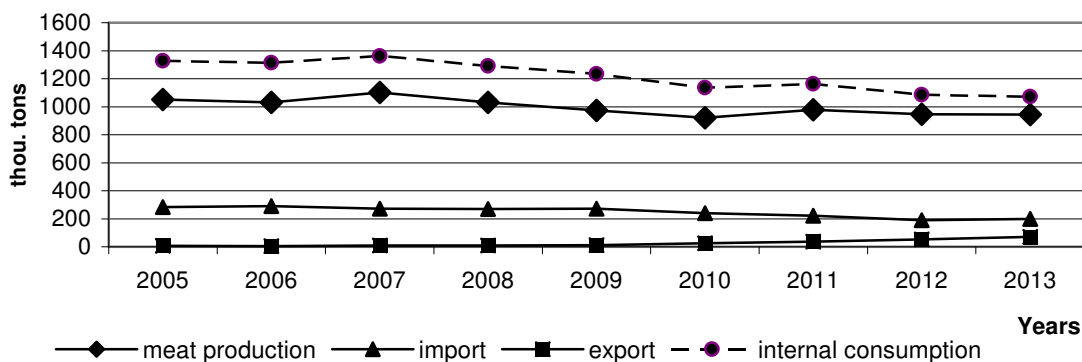
The purpose of the article is to discuss food security, understood as physical, economic and useful availability, on the lamb market in the EU. In addition, the paper also presents specific objectives. Such objectives include: presentation of the key concepts associated with food security and the lamb market; presentation of the data related to production and consumption of lamb in the EU; its consumption per capita as well as indication of the main import sources and an analysis of lamb prices in terms of economic availability. The research covered the period between 2005 and 2013, i.e. before, during and after the recent economic crisis and the subsequent economic upturn. The sources of materials included Polish and foreign literature as well as figures provided by FAPA (Foundation of Assistance Programmes for Agriculture) and EUROSTAT. The paper uses the following methods: descriptive, tabular, graphical, and the Pearson linear correlation coefficient.

Research results and discussion

In its basic meaning, food security could be defined as ensuring the right amount of food. The production of lamb in the EU countries does not meet the internal demand (Figure 1). The one might also observe a downward trend in the production, as in 2005 it amounted to 1051 thousand tons, and in 2013, it was only 944 thousand tons. In terms of the internal consumption of lamb, there was also a definite decline: from 1328 thousand tons in 2005 to 1073 thousand tons in 2013. At the same time, there was a decrease in the quantity of lamb which needed to be imported from outside of the EU in order to secure the internal market. In 2005, self-sufficiency stood at 79 %, and in 2013 – already at 88 %. Shortages were supplemented by imports, which also reported a decrease from 283 thousand tons in 2005 to 200 thousand tons in 2013. Despite domestic shortages, lamb is also sold outside the EU. The scale of such exports was rather limited, but it continued to grow in

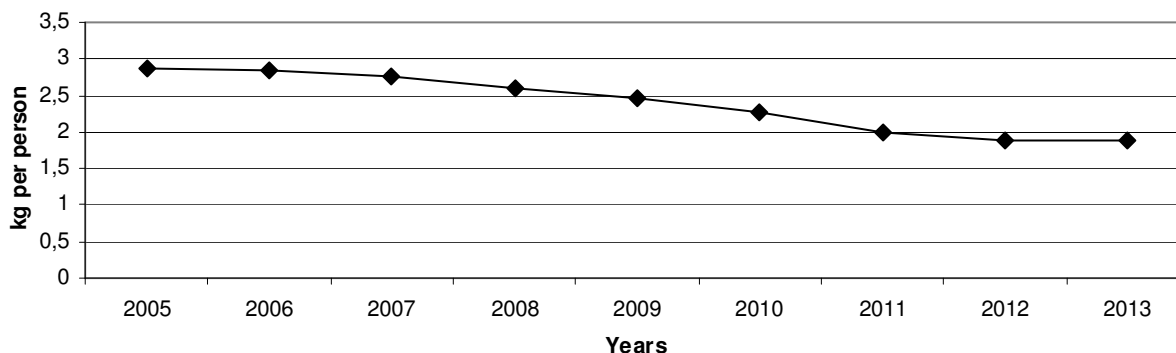
each subsequent year: in 2005 it amounted to approx. 6 thousand tons, and in 2013 - 70 thousand tons. A strong, significant correlation was determined - between the volume of lamb production and the volume of poultry production in the EU ($r=-0.87$, $p=0.01$), consumption of beef per capita ($r=0.83$, $p=0.01$), consumption of pork per capita ($r=0.75$, $p=0.02$), and the

internal demand for sheep meat in the EU ($r=0.92$, $p=0.001$). There were no significant dependencies between the volume of lamb production in the EU and the level of GDP per capita in the EU ($r=-0.35$, $p=0.35$), and the gross value added of agriculture ($r=-.02$, $p=0.94$).



Source: author's elaboration on the basis of FAPA data

Fig. 1. The balance of lamb meat in the European Union in 2005-2013 (thou. tons)



Source: author's elaboration on the basis of FAPA data

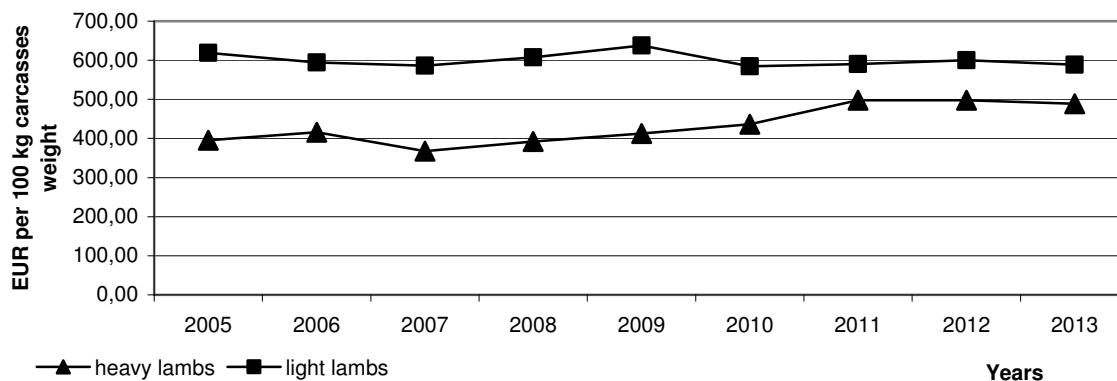
Fig. 2. Consumption of lamb meat in the European Union in 2005-2013 (kg per person)

Table 1

The main directions of lamb meat imports to the European Union in 2005-2013

| Specification | Imports of lamb meat in years (thou. tons) | | | | | | | | | |
|---------------|--|-------|-------|-------|-------|-------|-------|-------|-------|--|
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | |
| New Zealand | 236.7 | 241.3 | 243.2 | 230.3 | 227.9 | 211.3 | 192.9 | 169.6 | 178.7 | |
| Australia | 19.7 | 19.7 | 21.48 | 20.0 | 19.2 | 22.0 | 21.1 | 17.6 | 19.6 | |
| Uruguay | 5.7 | 6.0 | 6.0 | 5.9 | 5.7 | 4.5 | 5.0 | 3.4 | 3.3 | |
| Argentina | 8.9 | 8.1 | 5.5 | 5.6 | 7.2 | 6.0 | 4.3 | 1.9 | 1.1 | |
| Chile | 4.3 | 4.8 | 4.6 | 3.8 | 5.7 | 5.9 | 5.3 | 3.2 | 4.0 | |

Source: author's elaboration on the basis of FAPA data



Source: author's elaboration on the basis of FAPA data

Fig. 3. Prices of lamb meat in the European Union 2005-2013 (EUR per 100 kg carcasses weight)

Consumption of lamb gradually decreased (Figure 2). In 2005, it amounted to 2.9 kg per person, and in 2013 – only 1.8 kg per person. Despite the decline in its consumption, the production of lamb was still insufficient. The correlation between the level of lamb consumption per capita and selected parameters was examined. The most significant proved to be the correlation between consumption of lamb in the EU and its production ($r=0.80$, $p=0.01$), consumption of beef ($r=0.97$, $p=0.001$) and the GDP per capita in the EU ($r=0.74$, $p=0.02$).

The main sources of lamb imported to the EU have remained the same for many years (Table 1). Most lamb has been imported to the European Union market from New Zealand, followed by Australia and South American countries. However, it should be noted that in the case of most of these countries, between 2005 and 2013, the imported quantities gradually decreased. In terms of lamb imports, the so-called Community tariff quotas were applied. Until 2011, such quotas were determined annually, but since 2012 long-term EU quotas have been applied. In most countries, these quotas were not utilised in full. A strong, significant correlation was determined between the volume of imports of lamb in the EU and the volume of production of this type of meat in the EU ($r=0.72$, $p=0.03$), consumption of lamb per person ($r=0.97$, $p=0.001$), GDP per capita in the

EU ($r=-0.77$, $p=0.02$), and the gross value added of agriculture ($r=0.66$, $p=0.05$).

Broadly understood, food security focuses also on economic availability, which depends on the purchasing power and the prices of the food product. Lamb reference prices are quoted separately for light and heavy lambs (Figure 3). Production of light lambs (up to 22 kg of live weight) dominates in Greece, Italy, Portugal, Cyprus and Hungary, and production of heavy lambs (22-40 kg) – in the UK, France, Germany, Austria and Poland. In the years 2005 -2013, the average reference prices for heavy lambs stood at the level of EUR 368 – 498 per 100 kg of carcass weight, and in the case of light lambs – at the level of EUR 586 – 638 per 100 kg of carcass weight. As a rule, in the case of light lambs, the prices gradually increased over the period in question, and in the case of heavy lambs, they reached their peak in 2009, and continued to decrease thereafter. A strong, significant correlation was established between the price of heavy lambs in the EU and the volume of production of this type of meat in the EU ($r=-0.77$, $p=0.02$), consumption of lamb per person ($r=-0.92$, $p=0.001$), and imports of lamb ($r=-0.89$, $p=0.001$). The prices of light lambs were not correlated with any of the tested parameters.

In the broadest sense, food security focuses on providing people with useful products, characterised by proper nutritional and health

values. With its properties, lamb qualifies as food with extremely valuable benefits for human health, which fits well with the current approach to food security. From the biological and medical point of view, lamb is a phenomenon in itself because to date, no malignant tumour has been discovered in sheep. In the body of the animal, scientists have discovered a protective agent in the form of orotic acids, which are also used for the production of anti-cancer medicinal preparations and drugs. Orotic acids prevent obesity, inhibit the development of osteoporosis, stimulate the immune system, and demonstrate anti-atherosclerotic and anti-cancer activity. Vitro studies on human cells have proved that orotic acids inhibit the development of malignant melanomas as well as colon, rectum, lung, breast and nipple cancers. Therefore, consumption of lamb is beneficial for human health (Klepacki and Rokicki, 2005).

Conclusions

- 1) The concept of food security has evolved over centuries, and in the early twenty-first century, apart from providing an adequate amount of food, this concept also involves the proper quality of food in nutritional and health terms and its economic availability, regardless of the prevailing cultural and social standards.
- 2) One of the few EU markets affected by shortages is the lamb market. In the period between 2005 and 2013, sheep meat production decreased with the simultaneous increase in the share of self-supply as well as decrease in imports and consumption of lamb per capita. In quantitative terms, food security improved. The conducted studies helped to determine the correlation between lamb production and the tested parameters. The volume of lamb production was associated with other types of meat. A significant positive

correlation was determined between lamb production and consumption of beef and pork (there was a drop in the consumption of these types of meat). At the same time, a significant, negative correlation was determined between the production of lamb and the production of poultry, which competes with lamb while offering lower prices.

- 3) The relationship between consumption of lamb in the EU and its production and the level of GDP per capita in the EU proved to be of essence. Lamb is one of the most expensive types of meat. Whenever the economic situation in the EU deteriorated, European consumers tended to give up lamb and chose other types of meat, e.g. poultry. A significant correlation was found between the volume of lamb imported to the EU and the volume of its production in the EU, consumption of lamb per person and GDP per capita in the EU. The volume of imports was determined annually in the form of quotas. Since the calculations were based on the demand reported in the market, these dependencies do not seem to be strange. Lower imports may be due to the deterioration of the economic situation in the EU.
- 4) In economic terms, food security has been associated with the purchasing power of the society and the prices of lamb. Heavy lamb prices rose sharply and a significant negative correlation was found between the prices and the volume of production of this type of meat in the EU, lamb consumption per capita and imports of the meat. Lamb became a rather rare product, hence the prices continued to increase. As far as light lamb is concerned, no significant correlation of this type has been established between its prices and any of the tested parameters.

Bibliography

1. Barney, G. O., (1980). The Global 2000 Report to the President: Entering the Twenty-First Century. Volume One - The Summary Report.
2. Baer-Nawrocka, A., (2014). Zmiany w spożyciu i stopniu samowystarczalności żywnościowej w Unii Europejskiej (Changes in Consumption and Degree of Food Self-sufficiency in the European Union). *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 360, pp. 19-27.
3. Boserup, E., (1981). *Population and Technological Change: A Study of Long-term Trends*.
4. Ehrlich, P. R. (1968). *The Population Bomb*. New York: Ballantine.
5. Grochowska, R., Lopaciuk, W., Rosiak, E., Szajner, P., (2013). Światowa produkcja biopaliw w kontekście bezpieczeństwa żywnościowego (Global production of biofuels in the context of food security). *Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej-Państwowy Instytut Badawczy*.
6. Klepacki, B., Rokicki, T., (2005). Na zdrowie (For one's health), *Farmer*, 3, p. 14.
7. Klepacki, B., Rokicki, T., (2006). Prowadzenie efektywnych gospodarstw owczarskich po przystąpieniu Polski do UE (Conducting Efficient Sheep Farms after the Polish Accession to the EU). *Technologie produkcji owczarskiej*. Warszawa: Polskie Towarzystwo Zootechniczne.
8. Landreth, H., Colander, D. C., (2005). *Historia myśli ekonomicznej (History of Economic Thought)*, wyd. II uzupełnione. PWN.
9. List, F., Colwell, S., (1856). *National System of Political Economy*. JB Lippincott & Company.
10. Malysz, J., (1998). Bezpieczeństwo żywnościowe. W *Encyklopedia agrobiznesu. (Food security. In Encyclopaedia of Agribusiness.)*. Fundacja Innowacja, WSS-E, Warszawa.
11. Maxwell, S., (1996). Food Security: a Post-Modern Perspective. *Food Policy*, 21(2), pp. 155-170.
12. Meadows, D. H., Meadows, D. L., Randers, J., Behrens, W. W., (1972). *The Limits to Growth*. New York, p. 102.
13. Mechlem, K., (2004). Food Security and the Right to Food in the Discourse of the United Nations. *European Law Journal*, 10(5), pp. 631-648.
14. Nosecka, B., Pawlak, K., Poczta, W., (2011). Wybrane aspekty konkurencyjności rolnictwa (Selected aspects of the competitiveness of agriculture). *Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej-Państwowy Instytut Badawczy*.
15. Notestein, F. W., (1953). *Economic Problems of Population Change*. London: Oxford University Press, pp. 13-31.
16. Oleszko, A., (2006). *Prawo żywnościowe wspólnotowego rynku rolnego (Food Law Community Agricultural Market)*. Wolters Kluwer.
17. Pinstrup-Andersen, P., (2009). Food security: definition and measurement. *Food security*, 1(1), pp. 5-7.
18. Poczta, W., Pawlak, K., Dec, M., (2008). Determinanty sytuacji żywienia ludności świata (Determinants of the Situation of Alimentation of the World's Population). *Wies i Rolnictwo*, 2 (139), pp. 9-25.
19. Rokicki, T., (2005). Regulacje rynku mięsa baraniego i jagnięcego w Unii Europejskiej (Sheepmeat Market Regulations in European Union). *Roczniki Naukowe SERiA t. VII z. 2*, pp. 188-193.
20. Rokicki, T., (2015). Economic Results of Sheep Farms in Poland, *Economic Science for Rural Development, Economic Science for Rural Development. Proceedings of the International Scientific Conference*, No 37, pp. 86-92.
21. Rokicki, T., (2016). Sustainable Development in Energy Sector in the European Union Countries, *Economic Science for Rural Development. Proceedings of the International Scientific Conference*, No 43, pp. 108-116.
22. Rozporządzenie Parlamentu Europejskiego i Rady (UE) nr 1308/2013 z dnia 17 grudnia 2013 r. ustanawiające wspólną organizację rynków produktów rolnych oraz uchylające rozporządzenia Rady (EWG) nr 922/72, (EWG) nr 234/79, (WE) nr 1037/2001 i (WE) nr 1234/2007 (Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 Establishing a Common Organisation of the Markets in Agricultural Products and Repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007).
23. Sen, A., (1981). *Poverty and Famines: an Essay on Entitlement and Deprivation*. Oxford University Press.
24. Simon, J. L., (1998). *The Ultimate Resource 2*. Princeton University Press.
25. Szczepaniak, I., (2005). Ocena konkurencyjności polskich producentów żywności. (Assessment of Competitiveness of Polish Food Producers) *Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej-Państwowy Instytut Badawczy*.
26. Thompson, W. S., Lewis, D. T., (1965). *Population Problems*. New York: McGraw-Hill.
27. Wicksell, K., (1956). *Lectures on Political Economy (Vol. 1)*. Ludwig von Mises Institute.
28. Wilkin, J., (2009). Uwarunkowania rozwoju polskiego rolnictwa w kontekście europejskim i globalnym. Implikacje teoretyczne i praktyczne. (Conditions for Development of Polish Agriculture in the European and Global Context. The Implications of Theoretical and Practical). In *Polityka gospodarcza a rozwój kraju*, pp. 305-325.

SUSTAINABLE CONSUMPTION AS A BEHAVIOUR MODEL OF HOUSEHOLDS

Agnieszka Siedlecka¹

¹Pope John Paul II State School of Higher Education in Biala Podlaska

Abstract. The problem of sustainable consumption is an interdisciplinary issue. It constitutes an important element of interest in the area of sustainable development. Households, as the most numerous consumers in the national economy, creating various models of consumption can aim at positive influence over the natural environment, the sustainable use of possessed resources. The purpose of the study is to indicate differences in the attitude towards sustainable consumption on the basis of the declared consumer's attitude of a head of a household in relation to the natural environment. The declared attitude was presented through a subjective opinion of respondents in the scope of approach to purchase decisions in the context of the natural environment. To achieve such a goal, the following research questions were asked: whether households headed by respondents with the pro-ecological attitude more often took actions indicating for the implementation of sustainable consumption and whether there was a significant percentage of entities not implementing sustainable consumption among respondents who had declared the neutral attitude in all the examined behaviours. For the purpose of the study, survey research was conducted on the group of 100 heads of households chosen with the use of targeted choice method.

Key words: a household, sustainable consumption, consumer's attitude.

JEL code: D1, D12, Q01

Introduction

The issue of Sustainable Consumption and Production (SCP) is the centre of interests of sustainable development since the conference which took place in Rio in 1992. It was defined in 1995 as "the use of goods and services which meet the basic needs and improve the quality of life with the simultaneous minimization of the use of natural resources, toxic materials and waste as well as the emission of pollution in the life cycle in order not to threaten the fulfilment of needs of future generations" (Lawrence, McManus, 2008). Sustainable consumption is the consumption which meets our needs without the destruction of the environment or the excessive use of natural resources and, as the result, without causing hazard to the potential of future generations to satisfy their needs (Mortensen, 2006).

A. Tukker and others indicate that sustainable consumption and production can be implemented with the use of various solutions introduced in the economic system. Those strategies can include the following solutions (Tukker et al., 2010):

1) the greening of production by among others minimization of intensity of influence of mining and production activity by the

implementation of end-of-pipe technology (the technique of purification in the output);

- 2) the production of pro-ecological products and services by minimization of the use of materials and the use of energy per functional unit;
- 3) the intensification of usage by encouraging to more effective introduction of products and services (for example by promoting actions such as car-pooling);
- 4) pro-ecological patterns of consumption by redirecting expenditure in order to reduce the influence of alternative products and services;
- 5) the reduction of the amount of use (consumption) with the preservation of life quality.

Sustainable consumption is the process of satisfaction of needs striving to raise the quality of life with the simultaneous use of possessed resources and preservation of the ability to use them by future generations. The implementation of sustainable consumption is connected with raising ecological awareness of the society. One of the elements of ecological awareness is ecological sensibility understood as an interest in the issue of the natural environment (Siedlecka, 2015).

The aim of the study is to present differences in the approach to sustainable consumption

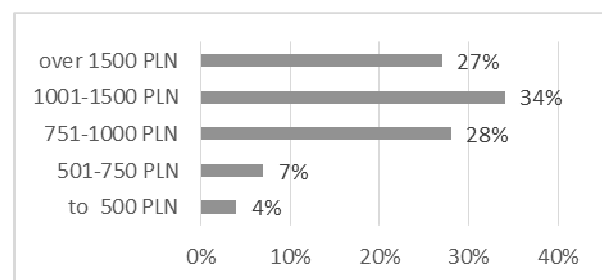
according to the declared consumer's attitude towards the natural environment. To attain such an objective, the following research questions were asked. 1. Do households headed by respondents with the pro-ecological attitude more often take actions indicating for the implementation of sustainable consumption? 2. Was there a significant percentage of entities not implementing sustainable consumption among respondents who had declared the neutral attitude in all the examined behaviours? To achieve the goals of the study, survey research was conducted on the group of 100 heads of households. The choice of the research sample was conducted with the use the method of targeted choice (non-probabilistic) - the snowball method. The main premise in the choice of respondents was the fact that they make purchases in the households. The research was conducted in the period April-June 2016.

Research results and discussion

The examined households were headed equally by women (51 %) and men (49 %). The age of participants was at the level of 30.97 years, with a standard deviation of 9.57 (the coefficient of variation 30.9). The vast majority of heads of households were persons with higher education - 76 % (including 35 % with a bachelor degree, 32 % with a master degree and 9 % who declared degree in engineering). One of the factors influencing the level of consumption is an income in a household. In Analysing the average monthly net incomes per one person in a household in the last year, it should be noticed that respondents declared their various levels (Fig. 1).

Under current socio-economic conditions, more houses are being built. Although they are inhabited by a lower amount of people, they consume more electric energy and energy used for heating. The total amount of energy used for heating rises systematically (Mortensen, 2006). Such a problem applies also to the surveyed households since they possess houses with a

large usable area. This feature is characterized by a high coefficient of variation - over 60 %, which makes it impossible to use an average as a cognitive measure. However, it should be noted that the minimal size of a house/a flat indicated by respondents was 20m² while maximal 800m². The number of rooms in respondents' houses and flats is also highly diversified. The average number of rooms reached the level of 5.27 with a standard deviation of 2.43 (the coefficient of variation 46 %). It should be indicated that the vast majority of respondents' households inhabit houses with a basic infrastructure.



Source: author's calculations based on research results

Fig. 1. The average monthly net incomes per one person in a household in the last year

Consumers' attitudes

Consumers' attitudes are shaped by a number of various factors, however the most characteristic ones are attitudes which take into account environmental issues, values of the environment and the care for it. The parameter of the declared consumers' attitude was constructed on the basis of three variables obtained from opinions of heads of households. Respondents indicated if:

- their daily purchase decisions are made taking into account the care for the natural environment and if they have knowledge of its basic problems;
- they pay attention to the influence made by purchased products on the natural environment;
- they choose a service provider on the basis of its attitude towards the natural environment and if it is important that the service provider uses products and devices which are environmentally friendly.

Obtained answers allowed distinguishing three types of attitudes: **neutral** to the issues of the natural environment; **non-extreme** - respondents were unable to unambiguously indicate if their consumers' decisions are made on the basis of pro-environmental issues and the ecological attitude or not. In the last case, the most significant factor which respondents take into account by making decisions are aspects of the natural environment both in the context of daily decisions as well as the influence of service providers on the nature. Such an attitude was defined as **pro-environmental**. On the basis of that division there was made an analysis of

respondents' opinions connected with actions in the scope of consumption.

One of the areas that indicate at an endeavour to sustainable consumption is a proper use of resources as well as an approach to purchases of goods and services on the market. Among activities characterizing consumers' attitudes connected with pro-environmental attitudes, the most frequent ones were: the use of energy saving bulbs (99 % of households), the use of environmentally-friendly shopping bags (76 %) or the segregation of municipal waste (71 %) - table 1.

Table 1

The implementation of activities in respondents' households

| Specification | Total | Neutral | Non-extreme | Pro-environmental | |
|---|-------|---------|-------------|-------------------|---|
| the use of energy saving bulbs | 99.0 | 100.0 | 97.7 | 100.0 | p=0.512 |
| the use of environmentally-friendly shopping bags | 76.0 | 56.7 | 79.1 | 92.6 | p=0.005 chi-square=10.445 V-Cramera=0.323 |
| the segregation of waste | 71.0 | 36.7 | 79.1 | 96.3 | p=0.000 chi-square=26.926 V-Cramera=0.519 |
| the prevention of waste production in a household | 70.0 | 53.3 | 67.4 | 92.6 | p=0.005 chi-square=10.665 V-Cramera=0.327 |
| the avoidance of objects and packaging containing toxic substances | 69.0 | 50.0 | 67.4 | 92.6 | p=0.002 chi-square=12.138 V-Cramera=0.348 |
| disconnection of electric appliances from a power source after the end of work | 69.0 | 40.0 | 76.7 | 88.9 | p=0.000 chi-square=17.994 V-Cramera=0.424 |
| the reduction of water consumption | 60.0 | 40.0 | 60.5 | 81.5 | p=0.006 Chi-square=10.195 V-Cramera=0.319 |

Source: author's calculations based on research results

In fewer cases, the heads of households indicated use of energy from renewable sources (19 %) or the choice of means of transport taking into account the ecological criterion (31 %). In analysing implementation of examined activities in the context of sustainable consumption, it should be indicated that there were statistically significant differences between the declared consumers' attitude and the implementation of some activities.

The most frequent activity connected with the effective use of resources is the reduction of consumption of energy, water or gas. Energy consumption in households (electric energy, gas etc.) and the energy used by cars constitute a share? of energy use (about 35 %) (Moll, 2005). A vast majority of examined households used energy saving bulbs in their houses (99 %). Also in this case, there were not statistically important differences in consumption between the groups of households (p=0.512). In both the households

which heads presented the pro-environmental attitude as well as in the neutral households such an activity was implemented. Likewise, statistically important differences did not occur in the area of declarations connected with an energy-efficient heating and the type of the attitude ($p=0.372$). The lack of such a dependency is also visible in case of using renewable sources of energy in the examined households. However, it should be noted that in case of households of respondents whose attitude was defined as pro-environmental there occurred a significantly higher percentage of households using such a form of energy production (33.3 %) - table 2.

Climate changes have a significant influence on the policy of countries in the scope of electric energy. It is a particular priority in relation to households since they use 1/3 of energy in developed countries (Gram-Hanssen, 2009). The consumption in the stand-by mode was identified as a new challenge in 1990. During analyses, the attention was paid to "energy leakage". On

average, 20 % of energy consumption in a household is used by electric devices as well as information and communication technologies (ICT). The half of this value is consumed in the stand-by mode. Due to the fact that the number of household appliances and consumer electronics, which constitute the equipment of households, rises, it is an important problem (Gram-Hanssen, 2009). This is the reason why a meaningful form of energy saving is disconnecting electric appliances from a power source after the end of work. Such an activity was taken in 69 % of examined households, among which the significant share was constituted by households with the head whose attitude was characterized as pro-environmental (88.9 %). There occurred a statistically significant dependence between the endeavour to save energy by disconnecting electric appliances left in the stand-by mode and the declared consumers' attitude ($p=0.000$; chi-square 17.994). The correlation between these variables was moderate (V-Cramera 0.424).

Table 2

The implementation of activities in respondents' households

| Specification | Total | Neutral | Non-extreme | Pro-environmental | |
|--|-------|---------|-------------|-------------------|---|
| the avoidance of an excess of packages | 60.0 | 30.0 | 62.8 | 88.9 | $p=0.000$ chi-square=20.778 V-Cramera=0.456 |
| the reduction of gas consumption | 48.0 | 33.3 | 46.5 | 66.7 | $p=0.041$ chi-square=6.393 V-Cramera=0.253 |
| the use of the most environmentally friendly packaging | 45.0 | 3.3 | 44.2 | 92.6 | $p=0.000$ chi-square=45.765 V-Cramera=0.676 |
| the energy-efficient heating | 39.0 | 30.0 | 39.5 | 48.1 | $p=0.372$ |
| taking activities connected with the elimination of environmental damage | 32.0 | 10.0 | 34.9 | 51.9 | $p=0.003$ chi-square=11.727 V-Cramera=0.342 |
| the choice of means of transport taking into account the ecological criterion | 31.0 | 16.7 | 32.6 | 44.4 | $p=0.074$ |
| the use of energy from renewable sources | 19.0 | 13.3 | 14.0 | 33.3 | $p=0.085$ |

Source: author's calculations based on research results

In case of other resources such as water and gas, respondents more often declared the endeavour to the effective use of water (60 %) than gas (48 %). However, taking into account

the fact that water resources in the global, worldwide scale are unsustainable, such amounts are unsatisfactory. Having regard to obtained data indicating that decisions on the reduction of

the use of both water and gas are more frequently taken by the heads of households who have the pro-environmental attitude, it should be considered how to aim at rising an amount of households taking active participation in the scope of consumption of resources they are in charge of.

There did not occur the statistically important difference between households characterized by three declared consumers' attitudes and the choice of means of transport by taking into account the ecological criterion ($p=0.074$). However, it should be mentioned that the phenomenon of sharing economy is becoming more and more popular in Poland. It includes a number of various phenomena for example BlaBlaCar (Jaros, 2016). It is a social network based on trust which connects drivers who have empty seats with passengers travelling in the same direction (<https://www.blablacar.pl>). R. Botsman indicates that it is used by 2 millions of people per month (Botsman). Such phenomena allow effective use of means of transport and, as a result, reduce its negative influence over the natural environment.

Another problem which is faced by households and enterprises in the context of environmental issues is waste. The production of waste in households is connected with the style of consumption. There is a relation between waste production and changes in consumption patterns (Tudor et al., 2011). Waste was once perceived as a burden to industry and societies. Changing attitudes, understanding of the problem of global warming and the loss of resources led to identification of waste as a valuable resource. The resource which requires proper collection, separation, management and recovery in order to be reused (Lehmann, 2011). In analysing obtained research results, it should be indicated that about 70 % of households' heads declared the endeavour to prevent waste production in a household as well as to segregate them. Taking into consideration the approach to the problem in

three groups of households in relation to declared consumers' attitudes, it should be noted that significantly more frequent activities in this scope were taken by respondents declaring the pro-environmental attitude than in other groups. Over 90 % of households' heads who declared the pro-environmental attitude indicated that they aim at the reduction of waste production and segregate them. In case of households' heads whose attitude was described as neutral, these values were significantly lower (merely 36.7 % declared the segregation of waste in a household, while 53.3 % declared activities reducing their production - table1).

Currently, there can be observed a growing number of enthusiasts who aim at the reduction of waste, the minimization of the use of food, clothing and house goods purchases as well as the use of reusable packaging or even buying products without packaging (Blumenfeld, 2015). Among matters being the object of research, there was the choice of respondents in the scope of the avoidance an excess of packages, the avoidance of objects and packaging containing toxic substances and taking into account the influence of packaging on the natural environment. In all of these aspects, there were statistically significant differences in the approach to this issue by three types of households ($p<0.005$ - table 2). Frequently, the decisions on the choice of products in packaging which is less detrimental for the environment were made in households headed by a person with the pro-environmental attitude (92.6 %), while only 3.3 % of households' heads with the neutral attitude answered that they paid attention to abovementioned issues. In this case we can speak of a strong dependence between the type of the attitude of a household's head and actions in this scope ($V\text{-Cramera}=0.676$). In other two cases (the avoidance of an excess of packages, the avoidance of objects and packaging containing toxic substances), the differences are lower, however they still indicate for significant

discrepancies in the activities taken in households - table 2. The matter connected with packaging issue is the use of reusable shopping bags. The usage of such a type of shopping bags indicates for the level of ecological awareness but is also dependant on financial factors. Currently in Poland, one-time bags are paid at the points of sale. There are being elaborated the amendments to the Act of 13 June 2013 on the management of packaging and packaging waste, which will lead to the considerable rise of their price. Such a solution may have an important influence on the resignation from buying them and the use of reusable shopping bags. The planned maximum price for a light plastic one-time bag is at the level of 1 zloty (currently, it is for example 0.08 zlotys). In the examined group, 76 % of respondents indicated that they use environmentally-friendly shopping bags. Nonetheless, it is possible to say that there is a statistical dependence between households ($p=0.005$). Households headed by persons with the pro-environmental attitude more often use reusable bags (92.6 %), in comparison to neutral households (56.7 %) and non-extreme ones in their attitude (79.1 %). After analysing the frequency of their use, it can be indicated that households' heads whose attitude was characterized as pro-environmental much more often declared their usage - average 4.89 with a standard deviation of 1.01. In case of other groups, the average was at the level of 3.83 for the neutral attitude and 4.53¹ for the non-extreme one.

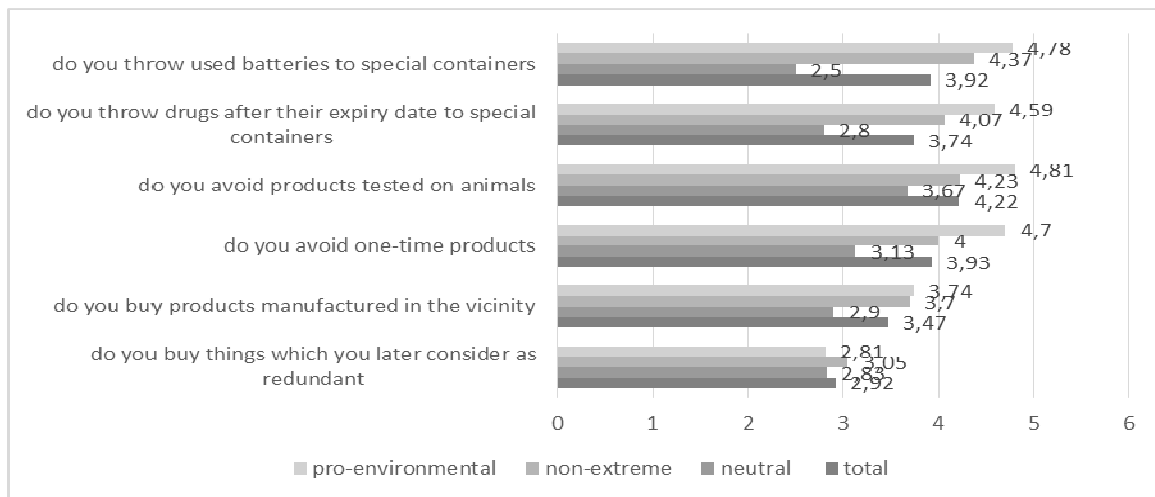
The use of reusable bags and the reduction of water, energy or gas consumption are activities which have an indirect influence on the natural environment. The other area of households' activities is taking actions directed towards the elimination of environmental damage. It can take various forms such as participation in non-governmental organizations dealing with

problems of the natural environment, forests cleaning. Such a form of activity is not the object of interest of examined respondents. Only 1/3 of households' heads with the non-extreme consumers' attitude and 10 % of neutral ones indicated that there are any activities in this scope taken in their households. In case of households' heads with the pro-environmental attitude, such a percentage reached the level of 51.9 % (table 2)

Another area enabling to analyse consumers' behaviours in the scope of the attitude towards sustainable consumption is the consideration of frequency of activities taken by respondents.

Respondents were asked to specify the frequency of six activities. They made an assessment with the use of the six-level scale from 1 to 6, where 1 meant that the activity was never exercised, while 6 meant that it was exercised very often. Among the examined activities the most popular one was the avoidance of purchasing products tested on animals (average 4.22; standard deviation 1.21). The renouncement of buying products tested on animals is a feature which is recognized by researchers as the factor determining behaviours of aware consumers. J. Lehota and others took that feature into account in relation to the style of Hungarian consumers (Lehota et al., 2012). However, referring to the results of research on three groups of households there are visible only slight differences in the declared frequency of that activity. Definitely, more often such products were not purchased by the members of households in which the head had declared the pro-environmental consumer's attitude (average 4.81; standard deviation 1.10).

¹ the assessment was made by respondents in the scale from 1 to 6, where 1 meant never, while 6 very often.



* the assessment was made by respondents in the scale from 1 to 6, where 1 meant never, while 6 very often.

Source: author's calculations based on research results.

Fig. 2. The average frequency of taking actions*

Households produce three main fractions of regular waste: kitchen, packaging and other raw materials, hygienic waste and others. The rest part of waste produced irregularly is among others: ashes and cinders from boiler-houses, green waste, large-scale waste, used electrical and electronic equipment as well as hazardous waste (Golen, 2014). Among hazardous waste there should be listed first and foremost batteries and accumulators as well as drugs after their expiry date. In the examined group of households' heads, the respondents with the pro-environmental attitude throw used batteries and drugs to special containers much more often than others – Fig. 2. Such an activity was far less popular in households in which their heads had declared the neutral attitude towards the natural environment. Differences between these two groups are major, which indicates that the use of specially labelled containers allowing separation of batteries from other waste, despite social campaigns, is not exercised by a large group of consumers. Throwing drugs together with other waste is also a hazardous phenomenon due to the issues of the natural environment itself as well as the risk of their uncontrolled consumption.

One of areas of sustainable consumption is the approach to one-time products. Taking into account their variety and availability on the

market (e.g. packages, vessels) consumers have a wide range of choices. In the vast majority of examined consumers, such goods are avoided. Most often one-time products are avoided by households' heads with the pro-environmental attitude (average 4.70; standard deviation 1.07). Respondents whose attitude was qualified as neutral more often used such products more often (average 3.13; standard deviation 0.8). Another important aspect connected with sustainable consumption is the endeavour to purchase products (mainly food) produced by local manufacturers. However, as it was noted by B. Kryk, it is hard to unambiguously answer the question if their purchase is connected with the growth of ecological awareness and sustainable consumption or economic and marketing factors. Advertisements of well-known shopping chains Biedronka and Lidl in their promotional activities use information about selling products from local manufacturers (Kryk, 2013). Among examined households', those heads who had declared pro-environmental and non-extreme attitudes more often aimed at purchasing such products (Fig. 2). However, such a phenomenon may be connected with issues concerning the availability of ecological products produced in the vicinity of households as well as other food products of which supplier is known.

The large availability of products and services owing to globalization is the factor influencing consumers' behaviours on the market. Currently, one of the attitudes visible on the market is consumption model. A household follows the theory of the consumer rational behaviour aims at achieving the highest level and standard of life (Siedlecka, 2015). One of its forms are consumer activities for showing off, which includes buying everything what is or is not needed. The purpose of such behaviour is the desire to show off (Włodarczyk, 2015). In the examined group of 100 heads of households, only 11 of them indicated that they never did that. The average frequency of purchasing redundant goods which are later classified by respondents as unnecessary reached the level of 2.92 (standard deviation 1.02). Taking into account the fact that the assessment was made in the scale from 1 to 6 (where 6 meant very often phenomenon, while 1 - it never occurred), the obtained result indicates that such a phenomenon is frequent. It was less often declared by households in which the pro-environmental attitude that was declared by the heads of households (average 2.81; standard deviation 0.7). However, differences between three types of households are minor.

Conclusions

- 1) The conducted analysis of the primary data makes it is possible to speak of differences in purchasing behaviours according to the declared consumers' attitude. The respondents with the pro-environmental approach more often implemented activities indicating the direction towards sustainable consumption. However, it should also be mentioned that in case of respondents whose attitude was neutral, the percentage of positive answers was also high.
- 2) The conducted statistical analyses of obtained data indicated that there did not occur statistically significant differences between the type of a household taking into account the declared attitude of a household's head and

certain activities indicating for sustainable consumption (the use of energy saving bulbs, the energy-efficient heating, the choice of means of transport paying attention to the ecological criterion or the use of energy from renewable sources). It means that in the examined group such activities are taken regardless of the consumer's attitude towards the natural environment. Oftentimes it is assumed that pro-environmental activities are undertaken in households if there is an opportunity to gain financial benefits. Interestingly, statistical differences occurred in other cases enabling respondents to make savings in relation to the reduction of water and gas consumption. A particularly interesting phenomenon is the fact that it is possible to speak of statistically significant differences among examined households in reducing the use of energy connected with the stand-by mode of domestic appliances. Therefore, it is possible to assume that the economic factor is not the only determinant influencing activities connected with the environment protection, sustainable consumption activities.

- 3) The obtained research results indicate for the need to search for factors which allow answering the question: what has an influence on the shaping of pro-environmental attitudes in households. The conducted analyses do not expose decisive discrepancies between the gender or the education of respondents and the presented attitude.
- 4) The surveyed respondents declared that they had bought products which they later considered as redundant and unused. It is possible to assume that there is a need to build consumers' awareness in the context of the analysis of possessed resources and their influence on the natural environment in order to implement sustainable consumption based on the effective use of owned assets.

Bibliography

Journal papers

1. Blumenfeld, J. (2015). Out of the Wasteland. The Zero-waste Movement is Changing How We Buy, Eat and Live. Here's How to Join in. *Delicious Living*, November 1, pp. 19-21.
2. Golen, M. (2014). Problemy kształtowania przez gminy opłat za gospodarowanie odpadami komunalnymi w świetle nowelizacji ustawy o utrzymaniu czystości i porządku w gminach. (Municipal Waste Charges Set by Municipal Authorities in the light of the Amendment to the Act on the Maintenance of Cleanliness and Order in Municipalities). *Studia i Prace Kolegium Zarządzania i Finansów*, No. 138, pp. 125-141.
3. Gram-Hanssen, K. (2009). Standby Consumption in Households Analysed With a Practice Theory Approach. *Journal of Industrial Ecology*, Volume 14, No 1, pp. 150-165.
4. Jaros, B. (2016). Bariery i pozytywne tendencje w rozwoju zrównowazonej konsumpcji w Polsce. (Obstacles and the Positive Tendencies in the Development of Sustainable Consumption in Poland). *Ekonomia i Środowisko* 2(57), pp. 24-36.
5. Kryk, B. (2013). Zrównowazona jakość życia a zrównowazona konsumpcja i zachowania ekologiczne polskich konsumentów. (Sustainable Quality of Life vs Sustainable Consumption and Environmental Consumer Behaviour). *Handel Wewnętrzny*, No (6), pp. 5-19.
6. Lawrence, K., McManus, P. (2008). Towards Household Sustainability in Sydney? Impacts of Two Sustainable Lifestyle Workshop Programs on Water Consumption in Existing Homes. *Geographical Research*, 46(3), pp. 314-332.
7. Lehota, J., Horvath, A., Racz, G. (2012). The Methodological and Practical Issues of Lifestyle Segmentation in Hungary, *Hungarian Research Agricultural, Journal of the Ministry of Rural Development Hungary*, September 2012, p. 19.
8. Moll, H.C., Noorman, K.J., Kok, R., Engstrom, R., Throne-Holst, H., Clark, C. (2005). Pursuing More Sustainable Consumption by Analysing Household Metabolism in European Countries and Cities. *Journal of Industrial Ecology*, Volume 9, No 1-2, pp. 259-275.
9. Mortensen L.F. (2006). Sustainable Household Consumption in Europe?. *Consumer Policy Review*, Volume 16, No 4, pp. 141-147.
10. Tudor, T., Robinson, G.M., Riley, M., Guilbert, S., Barr S.W. (2011). Challenges Facing the Sustainable Consumption and Waste Management Agendas: Perspectives on UK Households, *Local Environment*, Volume 16, No. 1, pp. 51-66.
11. Tukker, A., Cohen, M. J., Hubacek, K., Mont, O. (2010). The Impacts of Household Consumption and Options for Change. *Journal of Industrial Ecology*, Volume 14, No. 1, pp. 13-30.
12. Siedlecka, A. (2015). Degree of Meeting the Needs of Households from Valuable Natural Areas of the Lublin Voivodeship, *Economic Science for Rural Development*, No. 40, LLU ESAF, pp. 64-71.
13. Włodarczyk, K. (2015). Nowe kierunki i zjawiska w zachowaniach rynkowych polskiego społeczeństwa w XXI wieku. (New Tendencies and Phenomena in Market Behaviour Displayed by Polish Society in the 21st Century). *Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania*, Volume 2, No. 41, pp. 391-400.

Books

14. Siedlecka, A. (2015). Środowiskowe aspekty funkcjonowania wiejskich gospodarstw domowych na obszarach przyrodniczo cennych województwa lubelskiego. (Environmental aspects of the functioning of rural households in environmentally valuable areas Lublin province). Wydawnictwo PSW JPPII, Biała Podlaska, p. 138.

Internet sources

15. *Changing Patterns. UK Government Framework for Sustainable Production and Consumption 2003*, Department for Environmental, Food and Rural Affairs, London, s. 12. Retrieved: <http://collections.europarchive.org/tna/20060810193049/http://www.defra.gov.uk/environment/business/scp/pdf/changing-patterns.pdf>. Access: 14.12.2016.
16. Botsman, R. The Power of Sharing: How Collaborative Business Models are Shaping a New Economy, http://ebooks.capgemini-consulting.com/interviews/Rachel_Botsman_Interview.pdf. Access: 9.12.2016.
17. Lehmann, S. (2011). Resource Recovery and Materials Flow in the City: Zero Waste and Sustainable Consumption as Paradigms in Urban Development. *Sustainable Development Law & Policy*, Volume 11: Iss. 1, Article 13. Retrieved: <http://digitalcommons.wcl.american.edu/sdlp/vol11/iss1/13>. Access: 9.12.2016.
18. <https://www.blablacar.pl/o-nas>. Access: 9.12.2016.

EMPIRICAL METHODOLOGY OF MODERN MONOPOLISATION PROCESS ASSESSMENT: AN EXTENDED COMMENTARY

Dmitrijs Skoruks¹, Mg.oec., Maija Senfelde², Dr.oec.

^{1, 2}Faculty of Engineering Economics and Management, Riga Technical University

Abstract. The research "Empirical Methodology of Modern Monopolisation Process Assessment: an Extended Commentary" is an elaborated continuation of a study, previously conducted by the Authors (Skoruks, Senfelde, 2015), which capitalises on the relevant retrospective findings and delivers a multi-perspective in-depth description of the nature, the occurrence sources, the progression algorithm and the internal conjuncture specifics of the contemporary monopolisation process, while providing an example of market trend-detecting econometrical method implementation within a unified framework of competition analysis. The main scope of the research is devoted to developing and further enhancing the existing monopolistic trend detecting practices via quantitative analysis and multi-perspective examination of monopolisation effects, observed in modern globalized markets. The current research employs a system of monopolisation process progression describing quantitative indicators, based on authentic calculations, conducted within the framework of competition structure analysis in several industries over a five sequential year period, perceived through the prism of market power distribution between the involved supply-side market actors.

Key words: monopolisation process, econometrical modelling, competition level analysis, market conjuncture.

JEL codes: D42, D43, D52

Introduction

With the vast development of the modern business and trade, numerous former unquestioned and unchallenged visions of the market functioning paradigms, mechanisms and conformity of natural conducts are being transformed, re-evaluated and analysed from a strictly economic perspectives. Based on the classic A. Smith's theory, J. M. Keynes (Keynes, 1937); Dimand, 1955; Foster, McChesney, Jonna, 2011) alternative approach and works of P. Samuelson (Samuelson, 1939) as well as contribution from such notable authors as E. Chamberlin (Chamberlin, 1947), J. Robinson (Robinson, 1932), R. Coase (Coase, 1937, 1972), economic research is developing further along with the entire society, causally following and quickly reacting to newly emerging social trends. It states in "An Inquiry into the Nature and Causes of the Wealth of Nations" Book IV, Chapter VIII: "Consumption is the sole end and purpose of all production and the interest of the producer ought to be attended to, only so far as it may be necessary for promoting that of the consumer". Thus, the inventor of "invisible hand" concept underlines that no form of competition, regardless of its specifics and market conjuncture composition, is free from or can neglect the

maximum level of consumption capacity, made available by the current demand (Smith, 2007). As additionally argued by P. Samuelson: "Every good cause is worth some inefficiency" (The Independent, 2009). Thus, it may be argued that for the sake of economic stability maintenance and social utility maximization, a shift from perfect or near – perfect competition can and to some extent, should be made. Furthermore, as put by J. M. Keynes: "The difficulty lays not so much in developing new ideas as in escaping from old ones" (Keynes, 2011). Consequentially, these undoubtedly widely respected authors suggest a non – conventional approach to implementing new elements into the modern day economic theory while being able to take a fresh, innovative look at the seemingly common aspects of market interactions.

Nevertheless, there is one particular existing field of economic evaluation that has not seen any changes in the public opinion since the mid XIX century. It is still as well as more than a hundred years before, being seen as concentration of "capitalism evil" that brings only losses (Motta, 2004) and price increasing to all members of the society. The currently addressed phenomenon is a legal equity, profiting from the position of absolute monopoly, so attractive and

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

wanted by any actively functioning company, influencing all aspects of modern day economic processes, significantly changing the composition of any given market conjecture and reshaping all forms of business conduction possibilities (Skoruks, Senfelde, 2015).

The above mentioned position is being obtained via the process of monopolisation – one of the most topical phenomena of both developed and developing economies of the current century, significantly rising in importance of full understanding within the context of the world financial crisis aftermath. The composing element of any national economy, namely, markedly involved companies are forced to adapt to the process of globalization through finding new, sometimes quite unorthodox ways of securing the conducted business profitableness and liquidity (Dierker, Grodal, 1996), thus, consequentially increasing competition within any given market that frequently leads to the increase of market consolidation tendency, while excluding a large portion of inefficient companies from the market, leading to natural increasing of the industry monopolisation level (Skoruks, 2014).

The research objective of the current research, taking into consideration modern day economic challenges and above described tendencies, is to conduct a full – scale study on the nature of monopolisation process, detect its appearance sources, define the caused effect on modern economic systems as well as analyse and evaluate the main monopolisation influence factors that shape conduction of the process according to specifics of various industries' market conjecture.

The research hypothesis of the current study may be defined as follows: contemporary small open economies undergo a natural, economic reality-shaping factor-based and internal competition supported by market consolidation process, which leads to the acceleration of individual monopoly power concentration in specified niches, particularly in those industries

and relevant markets, which are excluded from participation in international trade and are therefore constrained in the scale of positive regional convergence and cross-border entrepreneurial cooperation effects, delivered by the interconnectedness of the modern global economy.

The research object of the current research is defined as five industries of Latvian national economy, their market conjunctures and specifics of competition conduction as well as revealed monopolisation trends and its development algorithm.

The main goals of the current research may be defined as follows:

- defining the existence substantiations, causes and consequences of monopolisation process;
- conducting a study of the process of monopolisation, its structured development and composition algorithm with the use of the developed model;
- development of an innovative methodology for quantitatively assessing the contemporary monopolisation process, which considers both the current level of market power concentration and its prevalent redistribution trends;
- testing the applicability of the developed methodology via its practical implementation under dynamic and mutually substantive condition of several distinct economic environments;
- elaboration on and enhancing of the previously conducted research.

The current research employed statistical analysis, comparatively–economical, coherently–logical and economic index analysis methods.

1. Concept of the developed monopolisation process evaluation methodology

A variety of singularised methods of monopolisation level assessment currently exists, the Lerner Index (Lerner, 1934) and the Herfindal – Hirshman Index (U.S. Department of

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

Justice...,2010) being of particular popularity. However, the above mentioned methods are either focused on single legal equity's individual market power measurement or are based on a zero-momentum, "time-frozen" market cluster analysis, which in either case of the distinct, formidable and undoubtedly revolutionary indexes seems to reflect a strategic focus on the current state of affairs rather than an approach, suited for evaluation of medium-term industry-level monopolisation trend. Thus, it would be rational and beneficial for both private market actors and public supervisory/regulatory bodies to have access to a quickly disposable, scientifically robust and easily applicable quantitative model, enabling a swift and resource-wise conduction of monopolistic trend analysis of an industry/relevant market level providing both numerical benchmarks and their corresponding qualitative interpretation.

The developed model will combine existing methods of both specialized monopoly and empirically-econometrical data assessment with authors' proposed innovation, consequentially designing a combined quantitatively - qualitative tool with cheap installation, easy implementation and demonstrative result outputs, suitable for use in both state sector for regulatory reasons and private equities with the goal of business planning or managerial tasks' performance improvement.

The use of already existing methods will allow to prosper from previously gained international experience, while implementation of newly developed correlations and additional influence factors shall provide a topical transformation of the necessary nature, inflicted by globalized units of merging market clustered composition, thus, creating a synergetic effect, consequentially improving the existing approaches while preventing innovative tool of assessment from untested and questionable fluctuation, reasoning scientific heritage with rational updates on a

scalar scale, reaching far more flexible, fundamental and coherent model composition.

The main foundation of the developed complex model of monopolisation process evaluation is the step-by-step assessment of available data from econometrical perspective with the perspective acquired scalar results of the conducted qualitative evaluation, allowing the conduction of a complex, multi-scale analysis, suitable for all economic field of activity, meaning that the current model shall be suitable for evaluations of any national economy industry.

The developed model composition will be further described in the following sections in order to provide a complete insight and sufficient understanding of the internal quantitative correlations between the model's composing structural elements as well as working out a steady implementation algorithm, while creating a qualitative interpretation methodology for assessing the quantitative scalar outputs of the conducted multi-factor analysis.

In order to verify the research hypothesis of the current study, consequentially approve or decline its conceptual formulation, the developed model shall be implemented, tested and statistically leveraged in order to prevent any minor calculation imprecision on the five following industries of the national economy of Latvia:

- industries, unaffected by import flows: mobile communication market, banking sector and multi-purpose retail trade market;
- industries, affected by import flows: brewing industry and pharmaceuticals production market.

The reason for selecting the above mentioned industries is the need for various situations' testing of the developed model, which can be reached only by its implementation within the framework of different and partially unrelated sectors of the economy, while defining the effect of import on market consolidation processes and,

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

consequentially, more rapid escalation and strengthening of monopolisation trend.

2. Quantitative functioning principles of the developed methodology

Reiterating the empirically-theoretical concept mentioned in the first section of the current research, individual market power of an enterprise consists of its ability to unilaterally implement an independently-favourable pricing policy and its current market share, defined as a fraction of the market short-term equilibrium total consumption capacity, composed of the corresponding supplier's economic activities within the mentioned relevant market. Therefore, an in-depth analysis of the two relevant crucial factors would greatly benefit the incorporation of assessment of market power phenomenon in the addressed broader problematic of monopolisation trend detection in modern globalised open markets.

Individual supply amount is critically affected by the existing or potential demand amount, with both of the mentioned fundamental economic factors being equalised or, econometrically speaking, mutually balances out by the common denominator of competitive market price. Therefore, it may be concluded that the effective size of an enterprise, measured by its presence in a market, is determined by the symbiosis of its individual supply amount and the corresponding sale price. It may be deduced that the individual supply amount multiplied by the relevant existing sale price would equal the turnover of the mentioned enterprise over a defined timeframe.

Therefore, if analysis of an industry level market's power distribution is being conducted or the required perspective dictates an evaluation, only focusing on a certain product type or non-supplementary market structures, the turnover of the supply-constituting enterprises shall deliver the required accurate and objective results (Dierker, Grodal, 1996).

In cases of imperfect or as defined by Chamberlin, monopolistic competition

(Chamberlin, 1947), which is the source of monopolisation process development and monopolistic trend emergence, market power is unevenly distributed between the suppliers, active in a relevant market, and the trend of exercising the available influence causally derives from the ability to either neglect or predetermine the retaliation actions of the existing effective competitors, which consequentially leads to monopolistic trend strengthening and potential establishing of a dominant position. Following such logic, the ratio of cumulative individual distribution of market power in case of the existing monopolistic competition to the equivalent value in situation of perfect competition would objectively and rationally reflect on the current state of monopolistic trend development and, if a dynamic trend is analysed, enable the calculation of such occurrence future emergence probability. A detailed elaboration on the current issue may be found in the authors' previously conducted research. (Skoruks, Nazarova, Senfelde, 2016).

3. Implementation of the developed methodology in the context of the defined research hypothesis verification

The calculations were conducted in a manner, adherent to the principles and methods, described in the previous research (Skoruks, Senfelde, 2015) and were based on the available statistical data (CSB, 2015; Lursoft data base, 2015; SAM, 2015) for the relevant analytical period. It would be rational to analytically summarize the acquired results of the conducted experimental implementation of the developed methodology in order to transparently compare both quantitative and qualitative aspect of the introduced models' applicable functionality. The quantitative results of the developed methodology's experimental implementation are reflected in Table 1.

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

Table 1

The quantitative results of the conducted experimental modelling

| | Indicator group average value over 2010-2014 | | |
|---|--|----------------------------------|------------------------------------|
| | Current level of monopolisation | Further monopolisation potential | Cumulative level of monopolisation |
| Industry, used in the model implementation experiment | | | |
| Mobile communication market | 35.08 % | 15.62 % | 28.27 % |
| Banking sector | 31.37 % | 25.53 % | 29.32 % |
| Multi-purpose retail trade market | 29.81 % | 20.13 % | 26.42 % |
| Brewing industry | 11.96 % | 11.94 % | 11.95 % |
| Pharmaceuticals production market | 6.97 % | 8.93 % | 7.66 % |

Source: compiled by the authors based on previously conducted research (Skoruks, Senfelde, 2015), (Skoruks, Nazarova, Senfelde, 2015), (Skoruks, Nazarova, Senfelde, 2016)

With the goal of creating a comparison between the results of the conducted quantitative experiment in a transparent and comprehensible manner, the developed model had been supplemented by a qualitative interpretation scale of the aforementioned numerical outputs. The qualitative interpretation of the quantitative values, taken by the indicators employed in the developed model, is disclosed in Table 2:

The information given in Table 2 verifies that the level of monopolisation in the mobile communication, multi-purpose retail trade markets and banking sector had a considerably higher current level of monopolisation than the brewing industry and pharmaceuticals production market. This indicates that those of the analysed industries, which had a significant amount of imports, tended to have a visibly lower total level of monopolisation, thus upholding the theory of international trade playing a positive role in development of competition environments, hence the process of monopolisation if addressed through the prism of econometric analysis as an economically natural, ever present phenomenon, may be considered as the regressive counterpart or "the flip side" of competition, meaning that

both monopolistic trend escalation and competitive strive strengthening are simultaneously present in every truly market economy and its industries (except for the public monopoly cases), while being directly-proportionately reversely orientated in terms of their maturity and conduct.

Table 2

The quantitative results of the conducted experimental modelling

| | Indicator group average value over 2010-2014 | | |
|---|--|----------------------------------|------------------------------------|
| | Current level of monopolisation | Further monopolisation potential | Cumulative level of monopolisation |
| Industry, used in the model implementation experiment | | | |
| Mobile communication market | 35.08 % | 15.62 % | 28.27 % |
| Banking sector | 31.37 % | 25.53 % | 29.32 % |
| Multi-purpose retail trade market | 29.81 % | 20.13 % | 26.42 % |
| Brewing industry | 11.96 % | 11.94 % | 11.95 % |
| Pharmaceuticals production market | 6.97 % | 8.93 % | 7.66 % |

Source: compiled by the authors based on previously conducted research (Skoruks, Senfelde, 2015), (Skoruks, Nazarova, Senfelde, 2016)

The fact that had proven to be even more intriguing is the acknowledgement that even mild presence of imports (as in the case of Latvian brewing industry) seems to stimulate a higher level of competition and a significantly diminished strive for monopolistic tendency progression, which may be explained by the fact that the presence of imports not only indicates a sufficient degree of market openness to new entry, but, more importantly, delivers a clear message of actual involvement into cross-border economic activity and at least regional trade, thus making the relevant market a more attractive option for international investment and further non-domestic market actor involvement. Sustainable business environments emergence, rational functioning and constituent development within modern, converging and financially attracting industries, which are simultaneously competitive,

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

diverse and adaptive in terms of their macroeconomic conjuncture structuring, is, therefore, a direct derivative of the scale of involvement in cross-border economic activities and international trade.

Conclusions

Taking into account the conduct, results and findings of the current research, one may conclude the following:

- 1) the process of monopolisation is a natural economic phenomenon, emerging from and simulated by competing enterprise strive for business process profitability, market position strengthening and gaining the desired entrepreneurial competitive advantages;
- 2) Monopolisation trends are most likely to emerge in situations of disproportionate individual market power distribution between supply-side market actors, engaged in economic activities within a defined relevant market and mutually competing while implementing price-related engagement strategies;
- 3) contemporary macroeconomic condition enable the emergence of an empirical

situation in which small open economies undergo a business environment (including its cyclical competent) factor-based and internal competition-driven process of market consolidation, which leads to an accelerated concentration of individual monopoly power in specified niches, particularly in those industries and relevant markets, which are excluded from participation in international trade and are therefore constrained in the scale of positive regional convergence and cross-border entrepreneurial cooperation effects, delivered by the interconnectedness of the modern global economy;

- 4) monopolisation tendencies may be detected through the analysis of mutual compensation effect of individual market power in the context of the aforementioned business cycle evolution;
- 5) applying harmonised quantitatively-analytical methods and their qualitative interpretation algorithms in the context of synergetic econometric modelling proved to be an efficient methodological approach of detecting, recording and evaluating contemporary monopolisation trends.

Bibliography

1. Chamberlin, E. H. (1947). *The Theory of Monopolistic Competition*. Fifth edition. Cambridge, Harvard University Press. pp. 30-116.
2. Coase, R. (1972). Durability and Monopoly. *Journal of Law and Economics*, Volume 15, Issue 1, pp. 143-149.
3. Coase, R. H. (1937). The Nature of the Firm. *Economica*, New Series, Vol. 4(16), pp. 386-405.
4. Database of the Central Statistical Bureau of the Republic of Latvia (CSB) (2015) [online]. Annual data on beer import and export flows. Retrieved: Available at: http://data.csb.gov.lv/pxweb/lv/atirdz/atirdz___detalizeta/?rxid=cdbc978c-22b0-416a-aacc-aa650d3e2ce0. Access: 17.07.2016.
5. Dierker, E., Grodal, B. (1996) Profit Maximization Mitigates Competition. *Economic Theory*, Volume 7, Issue 1, pp. 139-160
6. Dimand, R. W. (1955). Macroeconomics With and Without Keynes. *History of Economics Review*, Vol. 24(1), pp. 23-42.
7. Foster, J. B., McChesney, R. W., Jonna, R.J. (2011). Monopoly and Competition in Twenty First Century Capitalism. *Monthly Review*, Volume 62, Issue 11. Retrieved: <http://monthlyreview.org/2011/04/01/monopoly-and-competition-in-twenty-first-century-capitalism/>. Access: 29.11.2014
8. Keynes, J. (2011). *The General Theory of Money, Interest and Employment*. London: Macmillan. pp. 289-315.
9. Keynes, J. M. (1937). *The General Theory of Employment*. *The Quarterly Journal of Economics*, Vol. 51(2), pp. 209-223.
10. Lerner, A. P. (1934). The Concept of Monopoly and the Measurement of Monopoly Power. *The Review of Economic Studies*, Vol. 1(3), pp. 157-175.
11. Lursoft data base (2015). *Statistika Latvijas novadu/pilsetu griezuma (Latvian Region and City Statistics)*. Retrieved: Available at: <https://www.lursoft.lv/lursoft-statistika/Statistika-Latvijas-novadu-pilsetu-griezuma&id=515>. Access: 31.07.2016.
12. Motta, M. (2004). *Competition Policy. Theory and Practice*. Cambridge: Cambridge University Press. pp. 40 -55.

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

13. Robinson, J. (1932). Imperfect Competition and Falling Supply Price. *The Economic Journal*, Vol. 42(168), pp. 544–554.
14. Samuelson, P. A. (1939). Interactions between the Multiplier Analysis and the Principle of Acceleration. *Review of Economic Statistics*, Volume 21, Issue 1, pp. 75–78.
15. Skoruks, D. (2014). Complex Econometric Model of Monopolisation Process Evaluation. *Procedia - Social and Behavioral Sciences*, Volume 110, Issue 1, pp. 202-214.
16. Skoruks, D., Nazarova, J., Senfelde, M. (2015). Monopolistic Trend Analysis in the Context of Efficient Entrepreneurial Decision Making. *Journal of System and Management Sciences*, 2015, Vol.5, No.2. pp. 33-58.
17. Skoruks, D., Nazarova, J., Senfelde, M. (2016) Detecting Monopolisation Tendencies in the Context of Modern Business Cycles: a Quantitative Perspective. Jelgava: Latvia University of Agriculture, *Economic Science for Rural Development*, No.43, pp.197-205.
18. Skoruks, D., Senfelde, M. (2015) The Empirical Methodology of Modern Monopolization Process Assessment as a Sustainable Consumption Insurance Tool. Jelgava: Latvia University of Agriculture, *Economic Science for Rural Development*, No.40, pp. 14.-26.
19. Smith, A. (2007). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Books I, II, III, IV and V. Lausanne: MetaLibri. pp. 347-351.
20. State Agency of Medicines of the Republic of Latvia (SAM) (2015). *Statistics of Medicines Consumption (2009-2014)*. Retrieved: <https://www.zva.gov.lv/?id=99&sa=99&top=5>. Access: 31.07.2016
21. *The Independent* (2009). Paul Samuelson: Nobel Prize-winner widely regarded as the most important economist of the 20th century. Retrieved: <http://www.independent.co.uk/news/obituaries/paul-samuelson-nobel-prize-winner-widely-regarded-as-the-most-important-economist-of-the-20th-1841902.html>. Access: 30.07.2015.
22. U.S. Department of Justice and the Federal Trade Commission. (2010). *Horizontal Merger Guidelines*. Washington, D.C. pp. 16-19. Retrieved: <http://www.justice.gov/atr/public/guidelines/hmg-2010.html#5b>. Access: 29.11.2014.

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

DETECTING MONOPOLISATION TENDENCIES IN THE CONTEXT OF MODERN BUSINESS CYCLES: ELABORATION VIA IMPLEMENTATION

Dmitrijs Skoruks¹, Mg.oec.; Jekaterina Nazarova², Mg.oec.; Maija Senfelde³, Dr.oec.

^{1, 2, 3}Faculty of Engineering Economics and Management, Riga Technical University

Abstract. The research "Detecting monopolisation tendencies in the context of modern business cycles: elaboration via implementation" is the next step in empirical evidence gathering and applicability verification of a methodological framework, developed and disclosed in previously conducted study by the authors (Skoruks, Nazarova, Senfelde, 2016), aimed at providing new quantitative methods of monopolistic trend analysis, while simultaneously considering the economic effects, induced by modern business cycle progression. The research provides a multi-perspective in-depth description of the nature, the occurrence sources, the development procedure and the internal conjuncture specifics of the present day monopolisation process as well as provides an example of modern econometrical method application within a unified framework of market competition analysis for the purpose of conducting a quantitative competition evaluation of an industry – level, resulting in applicable outcomes, suited for both private and public actors in terms of investment/business activity strategic analysis for the former and policy/regulatory action planning for the latter. The main scope of the aforementioned research is devoted to developing and further enhancement of monopolistic tendencies' detecting and quantitative analysis practices, while simultaneously considering the broader context of macroeconomic volatility and the corrective market effects, occurring within various stages of business cycle development. The current research employs a system of economic situation – reflecting ratios based on authentic calculations, conducted within the framework of the chosen industry's structural conjuncture analysis, described through the prism of market power distribution between the involved supply – side actors, while attempting to conduct a robustness and applicability verification test of the empirical methodology via its practical implementation.

Key words: monopolisation process, market power, business cycle, competitive environment, methodology testing.

JEL codes: D42, D43, D47, D52, E32

Introduction

With the vast development of modern business practices and the advent of the globalised trade system, numerous formerly unquestioned and unchallenged visions of the economy functioning paradigms, market mechanisms and causality of business conduction processes had already been and still find themselves in a stage of productive transformation, re-evaluated and positively – critical analysis from various scholarly as well as professional perspectives. Based on the classic Adam Smith's theory (Smith, 2007), John Maynard Keynes (Keynes, 2011) alternative approach and works of Paul Samuelson (Samuelson, 1939), economic research is continuously developing along with the endlessly flexible social and market agenda, causally following and quickly reacting to newly emerging global and regional challenges. While considering the research, conducted by some of the most notable scholars of modern day economic theory, one may reasonably argue that certain aspects of

market interaction are justly defined as empirically – fundamental and thus may not be subjected to any sort of revisionary agendas, which occasionally do find their way onto the discussion issue lists of the modern economist community. Without prejudice to acknowledging certain areas of economic analysis, such as the demand – supply based market equilibrium or the law of diminishing returns, as indubitably empirical, a certain area of market functioning is indeed being addressed diversely by various scholars, professionals and interest group representatives due to the structural controversy, imbedded in the very essence of the relevant phenomenon. The issue in point is the process of monopolisation, taking place in an open market economy and seemingly contradicting with both the economic reasoning for competition – bases resource utilization, product distribution as well as means of production allocation, and the core benefit to society, brought by consumer choice possibilities, namely, needs' satisfaction in the context of market functioning efficiency.

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Jekaterina Nazarova, Tel.: +(371)29946837, E-mail address: Catherine.Nazarova@gmail.com;

³Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

As it had been previously argued, while the presence of a truly full monopoly undoubtedly brings unrecoverable (deadweight) losses to the society (Motta, 2004), the process of monopolisation is a natural state of affairs, based on both resource limitations and enterprise struggle for profitability, with the mentioned tendencies becoming excessively persistent and particularly visible in times of economic downslide and external shock occurrences (Skoruks, 2014), (Skoruks, Nazarova, Senfelde, 2016). The first deviation from the situation of competition, sufficient in terms of intensity and efficiency, is the obtaining of a dominant market position, which is recognized by the European Union Competition Law as not an infringement per se but rather as a potentially risky situation of possible future negative market trend development. As defined in the Article 102 of the Treaty on the Functioning of the European Union: "any abuse by one or more undertakings of a dominant position within the common market or in a substantial part of it shall be prohibited as incompatible with the common market insofar as it may affect trade between Member States" (TFEU, 1958). Therefore, it may be concluded that monopolisation tendencies constitute a potentially negative economic development, forever, in certain situation, such state of affairs may be "the least of two evils" in regards to the only remaining economically efficient option being a public body interference or even nationalisation, the latter being highly incompliant with the current developments in the European single market.

The question arises in defining the limits of monopolisation process remaining an economically natural and mostly tolerable, in terms of market functioning efficiency, development, adjusted by the consideration of the present stage of business cycle evolutionary maturity and the correspondently generated economic shocks, both endogenous and exogenous, and defining a boundary, which, if

crossed, leads the industry down the path of excessive market power concentration and counterproductive entrepreneurial practices, thus creating a sufficient basis for interference of competition monitoring public body with the goal of deterring further escalation of unfavourable monopolisation process.

The objective of the current research is the conduction of a study on the nature of monopolisation process, the role of market power concentration in monopolisation tendencies' progressive escalation and the defining of the degree of external factor influence in accelerating the mentioned occurrences, contextualised within the existing business cycle theories.

The hypothesis of the current research may be defined as follows: monopolisation tendencies in modern open market economies are driven by excessive individual market power concentration and may be detected and quantitatively measured by evaluating the relevant competition environment, while taking into account the relevant external influence of the business cycle evolutionary progression.

The scientific object of the current research may be defined as market power, perceived as an economic phenomenon, affected by both the internal competitive environment of a modern open market economy and the external influence of constituent business cycle evolution.

The main goals of the current research may be defined as follows:

- description and assessment of the existing substantiations, causes and consequences of modern monopolisation process with an emphasis on evaluation and explanation of the role, taken by market power as an economic phenomenon in the development and evolution of the empirical monopolisation process;
- development of a quantitative methodology of monopolisation process assessment, which considers both the current level of market

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Jekaterina Nazarova, Tel.: +(371)29946837, E-mail address: Catherine.Nazarova@gmail.com;

³Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

power concentration and its prevalent redistribution trends;

- incorporation of business cycle delivered adjustments to market power de facto distribution patterns, which reshapes the final evaluative perception of monopolisation process development in a relevant market into the structure of the previously mentioned methodology;
- testing the robustness and applicability of the developed methodology via its practical implementation in a challenging economic environment.

The following assessment methods shall be used in order to conduct the current research: monographic analysis, econometrical modelling, mathematical criteria analysis, quantitative economic pattern analysis, analysis of qualitative indicator structure and value ranges as well as data grouping method.

1. Theoretical basis of the developed methodology

In terms of economic evaluation, a monopoly is defined as a specific market situation that enables the obtaining of a higher profitability level of economic activity on the behalf of price growth and production cost cutting with the use of the so-called monopoly position advantages (Freedman, 1962). A vast variety of singularised methods of monopolisation level assessment currently exist and are widely implemented for a variety of analytical purposes, such as, for example, the Lerner Index (Lerner, 1934), the Herfindal – Hirshman Index (U.S. Department of Justice..., 2010) or the evaluation of price elasticity. However, the above mentioned methods are either focused on a single legal equity individual monopoly power measurement or target a zero-momentum, "time-frozen" market cluster, which, in both cases, is inappropriate for conduction of a medium-term industry-level holistic monopolisation trend evaluation. Furthermore, the mentioned methods are often mutually in compliant and lack

synergetic capacities, while remaining highly useful in terms of unilateral application (Skoruks, 2014), (Skoruks, Nazarova, Senfelde, 2016).

In this respect, it is important to note that the European Union Competition Law in the form of the European Commission Regulations and the European Court of Justice Decisions, addresses the issue of competition enhancements and the counterfactual process of monopolisation, defined as market consolidation, via the prism of the relevant market definition, emerging from the mutual overlapping of geographical and relevant product markets (European Commission, 1997). As it may be deduced from the previously stated information and additionally conducted legal text analysis (The Council of the European Union, 2004), the main emphasis in the European Union Competition Law is based on the effective and/or potential competition distortion mitigation, which is strictly prohibited as in compliant with the conditions of the Treaty on Functioning of the European Union and the conditionality of the Single Market functioning (TFEU, 1958). However, it is crucially important to underline the fact that even a case of *de facto* dominant position acquisition by a private organization is not a per se violation of the legislation in place – only the proven abuse of such position generated advantages forms a sufficient legal basis for public body interference. Therefore, it may be concluded that certain market imperfections are considered less harmful by the European Commission that direct administrative action caused distortion of natural economic process conduction (Council of the European Union, 2003). Consequentially, the current European context defines the necessity of quantitatively analysing monopolisation tendencies within relevant markets with a notion of tolerance for minor and, more importantly, economic by their nature cases of market power distribution imperfections, to an extent of accepting a dominant market position, obtained via good willed and fair competition, compliant with the

¹Dmitrijs Skoruks, Tel.: +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Jekaterina Nazarova, Tel.: +(371)29946837, E-mail address: Catherine.Nazarova@gmail.com;

³Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

rules, regulating the functioning of the European Single Market.

If addressing monopolisation trend quantitative detection through the prism of market power distribution, concentration and reconfiguration, one must first define the relevant phenomenon and describe its crucial, influence-shaping characteristics. The definition of market power varies among scholars and professionals, being interpreted according to individual commentators' experience, background and affiliation (White, 2012; Council of the European Union, 2004; OECD, 1993). However, several parallels may be drawn, in particular, regarding descriptive features of market power phenomenon and its essential economic structural components, leading to an empirical conclusion that market power enables enterprises to grow their presence in the relevant market and to an extent which is directly proportionate to the market power volume in point, unilaterally alter price levels.

2. Elaboration on the concept of the developed empirical methodology

Reiterating the empirically-theoretical concept mentioned in the first section of the current research, individual market power of an enterprise consists of its ability to unilaterally implement an independently-favourable pricing policy and its current market share, defined as a fraction of the total short-term equilibrium consumption capacity of the market, composed of the corresponding supplier's economic activities within the mentioned relevant market. Therefore, an in-depth analysis of the two relevant crucial factors would greatly benefit the incorporation of market power phenomenon assessment in the addressed broader problematic of monopolisation trend detection in modern globalised open markets.

Individual supply amount is critically affected by the existing or potential demand amount, with both of the mentioned fundamental economic factors being equalised or, econometrically

speaking, mutually balances out by the common denominator of competitive market price. Therefore, it may be concluded that the effective size of an enterprise, measured by its presence in a market, is determined by the symbiosis of its individual supply amount and the corresponding sale price. It may be deduced that the individual supply amount multiplied by the relevant existing sale price would equal the turnover of the mentioned enterprise over a defined timeframe.

Therefore, if an industry level market power distribution analysis is being conducted or the required perspective dictates an evaluation, only focusing on a certain product type or non-supplementary market structures, the turnover of the supply-constituting enterprises shall deliver the required accurate and objective results. (Dierker, Grodal, 1996).

In cases of imperfect or as defined by Chamberlin, monopolistic competition (Chamberlin, 1947), which is the source of monopolisation process development and monopolistic trend emergence, market power is unevenly distributed between the suppliers, active in a relevant market, and the trend of exercising the available influence causally derives from the ability to either neglect or predetermine the retaliation actions of the existing effective competitors, which consequentially leads to monopolistic trend strengthening and potential dominant position establishing. Following such logic, the ratio of cumulative individual market power distribution in case of the existing monopolistic competition to the equivalent value in situation of perfect competition would objectively and rationally reflect on the current state of monopolistic trend development and, if a dynamic trend is analysed, enable the calculation of such occurrence future emergence probability. A detailed elaboration on the current issue may be found in the authors' previously elaborated works (Skoruks, Nazarova, Senfelde, 2016).

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Jekaterina Nazarova, Tel.: +(371)29946837, E-mail address: Catherine.Nazarova@gmail.com;

³Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

3. The quantitative modifications to the structure and functioning principles of the developed methodology

The further introduced indicator of market power concentration distribution is based on measuring the state of de facto market conditions being divergent from those of a perfectly competitive situation, while taking into account the objective mutual interconnectedness of competing enterprise in the context of supply-side of the general market equilibrium. While presuming that each enterprise is rationally motivated to exploit their maximum market power on a largest possible scale and that every enterprise in a competitive environment theoretically engages every other opponent with the synergetic effect of marker power being a holistic economic phenomenon, the aggregated disproportionality of market power distribution in a relevant market may be determined as the opposite of simultaneous individual market power cumulative mutual compensation, to be more precise, its excessive amount, which is not being cancelled out by a pro rata competitor influence. Therefore, mutual cumulative individual market power compensation may be reflected by what for the purpose of the current research shall be further referred to as the mutual compensation index, which may be calculated in the quantitative fashion, described in the authors' previously developed research paper (Skoruks, Nazarova, Senfelde, 2016).

Business cycle development and constituent maturity stages may be evaluated in various manners, depending on the preferred economic paradigm or the prevalent common practices, dominant in a certain institution, organization or region (Hansen, 1985; Kitchin, 1923; Lee, 1955, Heijdra, 2009; Nazarova, 2014). However, certain approaches had proven themselves as specifically efficient in terms of industry level development analysis in a macroeconomic cycle context (Long, Plosser, 1983; Plosser, 1989; Romer, 2011, Nazarova, Dovladbekova, 2015; Skoruks, Nazarova, Senfelde, 2015). The initial five economic indicators, which had been chosen to represent the external effect the maturity and development of the general business cycle inflicts on internal market power distribution conjuncture, for the purpose of the current research and due to available macroeconomic data credibility issues had been recalibrated to become four methodology-comprising element: (1) market consumption capacity dynamics of the analysed industry; (2) dynamics of employment in the analysed industry; (3) dynamics of the share of the analysed industry in the GDP of the relevant national economy; (4) market capacity dynamic of the analysed industry relative to GDP of the relevant national economy. Correspondingly, the modified external adjustment ratio (Skoruks, Nazarova, Senfelde, 2016) may be calculated in the manner, reflected in Formula 1:

$$K = \frac{\sum_{t=1}^n \frac{MCC_t}{MCC_{t-1}}}{n} * \frac{\sum_{t=1}^n \frac{EMP_t}{EMP_{t-1}}}{n} * \frac{\sum_{t=1}^n \frac{GDP_{Pr,t}}{GDP_{Pr,t-1}}}{n} * \left[\left(\frac{\sum_{t=1}^n \frac{MCC_t}{MCC_{t-1}}}{\sum_{t=1}^n \frac{GDP_{Pr,t}}{GDP_{Pr,t-1}}} \right) * n - 1 \right] \quad (1)$$

where

K – external adjustment ratio, scalar values;

MCC – market consumption capacity, currency values;

EMP – employment in the analysed industry, scalar value;

GDP_{Pr} – real gross domestic product, currency values;

t – sliding consistent annual analytical period, years

n – cumulative timeframe of the conducted analysis, years.

As reflected by Formula 1, the external macroeconomic pressure alters the value ranges, further defined in Table 1, thus adjusting the qualitative interpretation of the affected qualitative reference benchmarks, while enabling

¹Dmitrijs Skoruks, Tel.: +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Jekaterina Nazarova, Tel.: +(371)29946837, E-mail address: Catherine.Nazarova@gmail.com;

³Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

a more accurate analytical perception of the addresses issue to be implemented as a coherent methodological approach.

Consequentially, monopolisation trend presence in a relevant market may be quantitatively detected by employing the proposed method, further referred to as the competition level index, which may be calculated in the manner, presented in Formula 2 as well as in the previously conducted research (Skoruks, Nazarova, Šenfelde, 2016) (also refer to for elaboration on qualitative interpretation of the acquired quantitative value ranges):

$$CLI = \frac{N^2 - \frac{N}{MCI \cdot K}}{N^2} = \frac{N^2 - X}{N^2} \quad (2)$$

where

CLI – competition level index, %;

N – median number of suppliers in the market within the analytical period, scalar values;

MCI – average mutual compensation index, scalar values;

K – external adjustment ration, scalar values;
X – market power x – factor: the quotient of N and the product of MCI and K, scalar values.

In order to verify the practical applicability of the developed methodology, its quantitative composition had been tested via its implementation in the Latvian mobile communication market, which had been in a state of a three supplier-based oligopoly, undergoing a continuous price war since at least 2010. A calculation, adhering to the principles, laid out in the developed methodology and based on the available macroeconomic statistics (CSB, 2016a, 2016b) as well as on THE annual reports of the relevant enterprises (Lursoft data base, 2016a, 2016b, 2016c), was conducted, generating intriguing results, which had been summarised in Table 1.

Table 1

Results of the conducted experiment: analytical summary

| Indicator | 2012/2011 | 2013/2012 | 2014/2013 | 2014/2011 |
|------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| N | 3 | 3 | 3 | 3 |
| MCL | 0.751503 | 0.787279 | 0.826801 | 0.755768266 |
| K | 1.233877 | 0.992597 | 1.114451 | 1.183149567 |
| CLI | 64.05 % | 57.34 % | 63.82 % | 62.72 % |
| Form of competition | Volatile progressive competition | Volatile progressive competition | Volatile progressive competition | Volatile progressive competition |
| Monopolistic trend endurance | Emerging | Emerging | Emerging | Emerging |

Source: compiled by the authors

As it may be seen from Table 1, the number of suppliers remained unchanged during the entire analytical period of four sequential years, so did the form of competition and monopolistic trend endurance qualitative indicators, implying that the relevant market remains in a constant competitive clinch, which, given its oligopolistic nature, leads to a state of price war continuation and price-based competition tool utilization. The MCL had reflected some minor fluctuation, generally revolving around ~0.75577 in terms of the relevant indicator's quantitative value, disclosing a situation of aggressive competition

and sharp mutual engagement between the suppliers, suggesting that consumer prices may generally be lower than they would have been if no price war had existed below its current scale and magnitude. The external adjustment ration had reflected a visible level of volatility, especially in 2012-2013 period, mostly due to a slowdown in both GDP and market consumption capacity growth, creating a paradigm of limited new competitor entrance possibilities, thus further entrenching the existing oligopolistic market structure. The competition level index had revealed a state of consistency in

¹Dmitrijs Skoruks, Tel.: +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Jekaterina Nazarova, Tel.: +(371)29946837, E-mail address: Catherine.Nazarova@gmail.com;

³Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

progressivity and volatility of the current competitive environment, which if seeming biased at the first glance, corresponds fully to a situation of competition being driven by a price war in a lasting oligopoly, meaning that the mentioned competition stays progressive and beneficial for consumers for as long as the price-based suppliers' individual market share redistribution's practices are adhered to by the involved service providers (the "progressivity" component), while presenting a significant risk of situation's stabilisation with possible eventual stagnation if the price-war is replaced with a "price-truce" (the "volatility" component). As a side note, it must be mentioned that the acquired results of the conducted experiment generally correspond and do not contradict the findings of the Latvian Competition Council's conducted inquiry into the competitive environment of the relevant market (CC, 2015). Therefore, it may be stated that the developed methodology had been proven to generate both quantitative outputs and qualitative outcomes, which are empirically logical and scientifically correct, while remaining statistically significant and clear in terms of their interpretation.

Conclusions

Taking into account the conduct, results and findings of the current research, one may conclude the following:

- 1) monopolisation tendencies are most likely to emerge in situations of disproportionate

- individual market power distribution between suppliers, conducting economic activities within a defined relevant market and may be altered by business cycle-caused external economic pressure and general macroeconomic development trends;
- 2) monopolisation tendencies may be detected through the analysis of individual market power mutual compensation effect in the context of the aforementioned business cycle evolutionary progression, specifically by applying harmonised quantitatively-analytical methods and their qualitative interpretation algorithms in the context of synergetic econometric modelling;
- 3) the developed methodology proved to be a robust and efficient approach to monopolisation trend detection, recording and evaluation, which performed well under challenging economic and market structuring conditions;
- 4) furthered implementation and testing of the developed methodology may positively contribute to enhancing its analytical record and functional credibility;
- 5) furthered implementation and testing of the developed methodology should be conducted under different economic and market structuring conditions that were described in the current research in order to make a positive contribution to the empirical credibility of the relevant analytical approach.

Bibliography

1. Chamberlin, E. H. (1947). *The Theory of Monopolistic Competition. Fifth edition.* Cambridge, Harvard University Press. pp. 30–116.
2. Competition Council of the Republic of Latvia (CC) (2015). *Market Inquiry into the Mobile Telecommunication Retail Tariffs.* Retrieved: <http://kp.gov.lv/documents/ce6dff5eda1e0e7895117b10842562a26f045429>. Access: 31.03.2016.
3. Council of the European Union (2003). Council Regulation (EC) No 1/2003 of 16 December 2002 on the Implementation of the Rules on Competition Laid Down in Articles 81 and 82 of the Treaty. Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003R0001&from=EN>. Access: 13.08.2015.
4. Council of the European Union (2004). *Council Regulation (EC) No 139/2004 of 20 January 2004 on the Control of Concentrations between Undertakings.* Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0139&from=EN>. Access: 13.08.2015.
5. Database of the Central Statistical Bureau of the Republic of Latvia (CSB) (2016a). *Gross Domestic Product – Key Indicators.* Retrieved: <http://www.csb.gov.lv/en/statistikas-temas/gross-domestic-product-key-indicators-30517.html>. Access: 17.07.2016

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Jekaterina Nazarova, Tel.: +(371)29946837, E-mail address: Catherine.Nazarova@gmail.com;

³Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467

6. Database of the Central Statistical Bureau of the Republic of Latvia (CSB) (2016b). *Employment and Unemployment – Key Indicators*. Retrieved: <http://www.csb.gov.lv/en/statistikas-temas/employment-and-unemployment-key-indicators-30679.html>. Access: 17.07.2016
7. Dierker, E., Grodal, B. (1996) Profit Maximization Mitigates Competition. *Economic Theory*, Volume 7, Issue 1, pp. 139-160
8. European Commission (1997). *Commission Notice on the Definition of Relevant Market for the Purposes of Community Competition Law*. Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31997Y1209%201%29&from=EN>. Access: 13.08.2015.
9. Hansen, G. D. (1985). Indivisible Labor and the Business Cycle. *Journal of Monetary Economics*, Volume 16, Issue 3, pp. 309–327.
10. Heijdra, B. (2009). Real Business Cycles. *Foundations of Modern Macroeconomics* (2nd ed.). Oxford: Oxford University Press. pp. 495–552.
11. Keynes, J. (2011). *The General Theory of Money, Interest and Employment*. London: Macmillan. pp. 289–315.
12. Kitchin, J. (1923). Cycles and Trends in Economic Factors. *Review of Economics and Statistics*, Volume 5, Issue 1, pp. 10–16.
13. Lee, M. W. (1955). *Economic Fluctuations*. Homewood, IL: Richard D. Irwin, pp. 2-25.
14. Lerner, A. P. (1934). The Concept of Monopoly and the Measurement of Monopoly Power. *The Review of Economic Studies*, Volume 1, Issue 3. Pp. 157–175.
15. Long, J. Jr., Plosser, Ch. (1983). Real Business Cycles. *Journal of Political Economy*, Volume 91, Issue 1, pp. 39-69.
16. Lursoft data base (2016a). *Enterprise annual reports: 2009-2014*. Retrieved: <http://www.lursoft.lv/uznemumazzina/?code=000305093>. Access: 31.08.2016.
17. Lursoft data base (2016b). *Enterprise annual reports: 2009-2014*. Retrieved: <http://www.lursoft.lv/uznemumazzina/?code=000327285>. Access: 31.08.2016.
18. Lursoft data base (2016c). *Enterprise annual reports: 2009-2014*. Retrieved: <http://www.lursoft.lv/uznemumazzina/?code=000374242>. Access: 31.08.2016.
19. Motta, M. (2004). *Competition Policy. Theory and Practice*. Cambridge: Cambridge University Press. pp. 40 –55.
20. Nazarova, J. (2014). Portfolio Structure Planning and Its Future Price Forecasting Model. Vilnius: Vilnius Gediminas Technical University, *Business and Management*, pp. 290–297.
21. Nazarova, J., Dovladbekova, I. (2015) Investment Planning in the Context of Volatile Business Cycles. Jelgava: Latvia University of Agriculture, *Economic Science for Rural Development, No.37*. pp. 180-189.
22. Organisation for Economic Cooperation and Development (OECD) (1993). *Glossary of Industrial Organisation Economics and Competition Law*. Paris, pp. 57. Retrieved: <http://www.oecd.org/regreform/sectors/2376087.pdf>. Access: 13.08.2015.
23. Plosser, C. (1989). Understanding Real Business Cycles. *Journal of Economic Perspectives*, Volume 3, Issue 1, pp. 51–77.
24. Romer, D. (2011). Real-Business-Cycle Theory. *Advanced Macroeconomics* (Fourth edition). New York: McGraw-Hill. pp. 189–237.
25. Samuelson, P. A. (1939). Interactions between the Multiplier Analysis and the Principle of Acceleration. *Review of Economic Statistics*, Volume 21, Issue 1, pp. 75–78.
26. Skoruks, D. (2014). Complex Econometric Model of Monopolisation Process Evaluation. *Procedia - Social and Behavioral Sciences*, Volume 110, Issue 1, pp. 202-214.
27. Skoruks, D., Nazarova, J., Senfelde, M. (2015). Monopolistic Trend Analysis in the Context of Efficient Entrepreneurial Decision Making. *Journal of System and Management Sciences*, 2015, Vol.5, No.2. pp. 33-58.
28. Skoruks, D., Nazarova, J., Senfelde, M. (2016) Detecting Monopolisation Tendencies in the Context of Modern Business Cycles: a Quantitative Perspective. Jelgava: Latvia University of Agriculture, *Economic Science for Rural Development, No.43*, pp.197-205.
29. Smith, A. (2007). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Books I, II, III, IV and V. Lausanne: MetaLibri. pp. 347-351.
30. Treaty on the Functioning of the European Union (TFEU) [Consolidated version] (1958). Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:12012E/TXT&from=EN>. Access: 13.08.2015.
31. U.S. Department of Justice and the Federal Trade Commission. (2010). *Horizontal Merger Guidelines*. Washington, D.C. pp. 16-19. Retrieved: <http://www.justice.gov/atr/public/guidelines/hmg-2010.html#5b>. Access: 29.11.2014
32. White, L. (2012). Market Power: How Does It Arise? How Is It Measured? New York: *New York University, Leonard N. Stern School of Business, Department of Economics, Working papers, EC-12-06*. Retrieved: http://webdocs.stern.nyu.edu/old_web/economics/docs/workingpapers/2012/White_MarketPowerRiseandMeasure.pdf. Access: 13.08.2015

¹Dmitrijs Skoruks, Tel. +(371)27638384, E-mail address: Dmitry.Skoruk@gmail.com;

²Jekaterina Nazarova, Tel.: +(371)29946837, E-mail address: Catherine.Nazarova@gmail.com;

³Maija Senfelde Tel.: +(371)29184578. E-mail address: Maija.Senfelde@rtu.lv, fax +(371) 67089467