

# **“ECONOMIC SCIENCE FOR RURAL DEVELOPMENT”**

Proceedings of the  
International Scientific Conference

**PRIMARY AND SECONDARY PRODUCTION,  
CONSUMPTION**

**№ 16  
2008  
Jelgava**

**TIME SCHEDULE OF THE CONFERENCE:**

1. Preparation – September 2007 - April 2008;
2. Process – April 24-25, 2008

**The Ministry of Agriculture of the Republic of Latvia has supported the publishing of the Proceedings**

- Ministry of Agriculture of the Republic of Latvia, 2008
- Latvia University of Agriculture, 2008
- Technological Educational Institute of Thessaloniki, 2008
- Lithuania University of Agriculture, 2008
- Aristotle University of Thessaloniki, 2008
- Swedish University of Agricultural Sciences, 2008
- University of Helsinki, 2008
- University of Padova, 2008
- University of Venice, 2008
- University of Latvia, 2008
- Austria Federal Institute of Agricultural Economic, 2008
- Agricultural University of Krakow, 2008
- Agricultural University of Szczecin, 2008
- Academy of Agricultural and Forestry Science of Latvia, 2008
- University of Technology and Life Sciences in Bydgoszcz, 2008
- Daugavpils University, 2008
- Estonian University of Life Sciences, 2008
- Latvian State Institute of Agrarian Economics, 2008
- Association of farmers of Latvia, 2008
- Federal Institute for Less-Favoured and Mountainous Areas, Austria, 2008
- Riga Technical University, 2008
- University of Bonn, 2008
- Warsaw University of Life Science, 2008
- Latvia University of Agriculture, Faculty of Economics, 2008
- Kaunas University of Technology, 2008
- Estonian University of Life Sciences, 2008
- Research Institute of Biotechnology and Veterinary Medicine “Sigra” of Latvia University of Agriculture, 2008
- University of Warmia and Mazury in Olsztyn, 2008
- University of Tartu, 2008
- Research Institute of Agriculture Machinery of Latvia University of Agriculture, 2008
- Rēzekne Higher School, 2008

**Printed in Jelgavas tipogrāfija**

**ISSN 1691-3078**

**ISBN 978-9984-9997-0-8**

**Abstracted / Indexed: AGRIS, EBSCO**

## **Programme Committee of International Scientific Conference**

<b>Professor Baiba Rivža</b>	President of the Academy of Agricultural and Forestry Sciences of Latvia; academician of <b>Latvian</b> Academy of Sciences; foreign member of Academy of Agricultural Sciences of Russia; foreign member of Academy Geographily (Italy), foreign member of the Royal Swedish Academy of Agriculture and Forestry
<b>Professor Thomas Kutsch</b>	Dr. Prof. Institute for Food and Resource Economics, Head of Department of Economic Sociology University of Bonn, <b>Germany</b>
<b>Professor Jonas Čaplikas</b>	Dean of the Faculty of Economics of <b>Lithuanian</b> University of Agriculture
<b>Professor Mieczyslaw Adamowicz</b>	Head of the Department of Agrarian Policy and Marketing of Warsaw University of Life Sciences, <b>Poland</b>
<b>Professor Edi Defrancensko</b>	Department of Land and Agroforestry Systems Faculty of Agriculture, (TeSAF), University of Padova , <b>Italy</b>
<b>Associate professor Erwin Schmid</b>	Dr.oec., assoc.prof., Vienna, <b>Austria</b>
<b>Professor Antoni Miciewicz</b>	Head of the Department of Agrarian Business of the University of Agriculture in Szczecin, <b>Poland</b>
<b>Professor Irina Pilvere</b>	Dean of the Faculty of Economics of the <b>Latvia</b> University of Agriculture
<b>Professor Kazimirs Špoģis</b>	Corresponding member of Latvian Academy of Sciences; honorary member of the Academy of Agricultural and Forestry Sciences of Latvia; head of the doctoral programme at the Faculty of Economics of <b>Latvia</b> University of Agriculture
<b>Professor Ingrīda Jakušonoka</b>	Head of the Department of Accounting and Finances at the Faculty of Economics of <b>Latvia</b> University of Agriculture
<b>Professor Voldemārs Striķis</b>	Head of the Department of Agrarian Economic Sciences of the Academy of Agricultural and Forestry Sciences of <b>Latvia</b> ; foreign member of the Royal Swedish Academy of Agriculture and Forestry; foreign member of the Academy of Agricultural Sciences of Russia
<b>Professor Tiiu Ohvril</b>	Director of Studies Institute of Economics and Social Sciences, <b>Estonian</b> University of Life Sciences

The chief facilitator and project leader – professor, Dr. **Ingrīda Jakušonoka**

## **Editorial Board**

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

<b>Professor Ingrīda Jakušonoka</b>	Latvia
<b>Associate professor Gunita Mazūre</b>	Latvia
<b>Professor Thomas Kutsch</b>	Germany
<b>Professor Kazimirs Špoģis</b>	Latvia
<b>Professor Antoni Mickiewicz</b>	Poland
<b>Professor Edi Defrancesco</b>	Italy
<b>Professor Kostas Valužis</b>	Lithuania
<b>Professor Marek Klodzinski</b>	Poland
<b>Associate professor Vilija Aleknevičiene</b>	Lithuania
<b>Professor Īrija Vītola</b>	Latvia
<b>Professor Bo Öhlmer</b>	Sweden

Editor – in-chief and responsible  
compiler of the proceedings:  
Assistants to the responsible compiler:

professor **Ingrīda JAKUŠONOKA**  
**Anastasija SVARINSKA**  
**Inese GRUNDŠTEINA**  
**Ingrīda KANTIKE**

Language Editor: **Gunita MAZŪRE**

Layout designer: **Ināra BAJĀRE**

## 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 78 reviewers from scientific and academic institutions of eight countries (Finland, Sweden, Switzerland, Estonia, Greece, Lithuania, Poland and Latvia) have written 200 reviews.

Markku Koskelu	Dr.oec., prof. (Helsinki, Finland)
Dalius Butkauskas	Dr. (Vilnius, Lithuania)
Csaba Jansik	Ph.D. (MTT Agrifood Research, Finland)
Christine Hirszowicz	Dr.,Prof. (Banking, Zurich, Switzerland)
Grzegorz Spychalski	Dr.oec., prof. (Szczecin , Poland)
Voldemārs Strīķis	Dr.agr., prof.(LLU, Latvia)
Julius Urbonas	Dr.soc.sc., assoc.prof. (Kaunas, Lithuania)
Kazimirs Špoģis	Dr.habil.agr., prof. (LLU, Latvia)
Sergejs Boļšakovs	Dr.oec., assist.prof.(RA, Latvia)
Viktors Nešpors	Dr.oec., prof. (RTU, Latvia)
Tomasz Siudek	Dr., prof. (Warsaw, Poland)
Daniel Lunneryd	Dr., (SLU, Sweden)
Valentinas Navickas	Dr.,prof. (Kaunas, Lithuania)
Ingrīda Jakušonoka	Dr.oec., prof. (LLU, Latvia)
Jānis Kaktiņš	Dr.oec., assoc.prof. (LLU, Latvia)
Aina Muška	Dr.oec., assist.prof.(LLU, Latvia)
Anita Auziņa	Dr.oec., assoc.prof. (LLU, Latvia)
Veronika Buģina	Dr.oec., prof. (LLU, Latvia)
Īrija Vītola	Dr.oec., prof. (LLU, Latvia)
Gaida Kalniņa	Dr.oec., assoc.prof (LLU, Latvia)
Aina Dobeļe	Dr.oec., assoc.prof. (LLU, Latvia)
Pawel Mickiewicz	Dr.habil., prof. (Szczecin, Poland)
Andra Zvirbule – Bērziņa	Dr.oec., assoc.prof. (BA Turība, Latvia)
Andris Šnīders	Dr.hab.ing., prof. (LLU, Latvia)
Gunita Mazūre	Dr.oec., assoc.prof. (LLU, Latvia)
Alersander Lewante	Dr.hab.,prof. (Olsztyn, Poland)
Bogusław Stankiewicz	Dr.hab.oec. (Szczecin, Poland)
Aija Eglīte	Dr.oec., assoc.prof. (LLU, Latvia)
Bogdan Klepacki	Dr.hab.,prof. (Warsaw, Poland)
Irina Arhipova	Dr.sc.ing., prof. (LLU, Latvia)
Wojciech Gotkiewicz	Dr.hab.,prof. (Olsztyn, Poland)
Helena Hansson	PhD., ( SLU, Sweeden)
Dzintra Knape	Dr.biol. (VA NBD, Latvia)
Heidi Soe	Ph.D.,assoc.prof. (EULS, Estonia)
Janusz Źmija	PhD., DSc.,prof. (Krakow, Poland)
Stanisław Bogiński	Dr.hab. (Warsaw, Poland)
Leonid Varabyou	Dr.hab.,prof. (Szczecin, Poland)

Sofija Ruskule	Dr.oec.,assit.prof. (LLU, Latvia)
Dariusz Strzebicki	Dr. (Warsaw, Poland)
Constantinos-Vasilios Priporas	Ph.D. (Greek Open University, Greece)
Vilija Aleknevičiene	Dr.oec., assoc.prof.(LUA, Lithuania)
Aivars Strautnieks	Dr.oec., assoc.prof. (LLU, Latvia)
Uno Silberg	PhD, assoc.prof. (EULS, Estonia)
Alla Serjogina	Dr.oec.,assit.prof. (TSI, Latvia)
Aldona Zawojaska	Dr. (Warsaw, Poland)
Anastasija Vilciņa	Dr.oec., prof. (LLU, Latvia)
Ainārs Galiņš	Dr.sc.ing., assoc.prof. (LLU, Latvia)
Uldis Ivans	Mg.oec., assoc.prof.(LLU, Latvia)
Pēteris Rivža	Dr.hab.sc.ing., prof. (LLU, Latvia)
Vulfs Kozlinskis	Dr.oec., prof. (LLU, Latvia)
Irina Pilvere	Dr.oec., prof. (LLU, Latvia)
Baiba Rivža	Dr.oec., prof. (LLU, Latvia)
Rita Liepiņa	Dr.oec., prof. (RA, Latvia)
Viktorija Raņķevica	Dr.oec., assoc.prof. (BA, Latvia)
Elita Jermolajeva	Dr.oec., assoc.prof. (DU, Latvia)
Evelīna Špakoviča	Dr.oec., assoc.prof. (LLU, Latvia)
Leonārs Svarinskis	Dr.oec., prof. (RA, Latvia)
Arnis Kalniņš	Dr.hab.oec. (LLU, Latvia)
Andris Sproģis	Dr.oec., prof. (LU, Latvia)
Jaan Leetsar	Dr.oec., assoc.prof. (EULS, Estonia)
Ināra Jurgena	Dr.oec.,assoc. prof. (LLU, Latvia)
Juris Saulītis	Dr.oec., prof. (RTU, Latvia)
Jānis Ābele	Dr.oec., assoc.prof. (LLU, Latvia)
Aleksandrs Gailums	Dr.oec.,assoc. prof. (LLU, Latvia)
Andris Miglavs	Dr.oec., (LVAEI, Latvia)
Aleksandrs Adamovičs	Dr.agr., prof. (LLU, Latvia)
Ilmārs Kālis	Dr.oec., prof. (LU, Latvia)
Anda Zvaigzne	Dr.oec., assist.prof. (LLU, Latvia)
Voldemārs Bariss	Dr.phil., as.prof. (LLU, Latvia)
Alina Danilowska	PhD.,hab. (Warsaw, Poland)
Anda Jankava	Dr.oec., prof. (LLU, Latvia)
Roberts Škapars	Dr.oec., prof. (LU, Latvia)
Modrīte Pelše	Dr.oec., assist.prof. (LLU, Latvia)
Evija Kopeika	Dr.oec., lect.. (LLU, Latvia)
Zinta Gaile	Dr.agr., prof. (LLU, Latvia)
Biruta Sloka	Dr.oec., prof. (LU, Latvia)
Baiba Briede	Dr.paed., prof. (LLU, Latvia)
Agita Līviņa	Dr.oec., assoc.prof. (VIA, Latvia)

## Foreword

Every year the Faculty of Economics, Latvia University of Agriculture holds the international scientific conference “Economic Science for Rural Development” and publishes internationally reviewed papers of scientific researches, which are presented at the conference. Many economic scientists from different European countries participate in the conference. The themes of the conference are very closely connected with the current situation, therefore even three volumes of the conference proceedings are published – 15, 16 and 17. The first volumes of scientific conference proceedings were published already in 2000. **The Ministry of Agriculture of the Republic of Latvia supports the organisation of the conference and the publication of scientific proceedings.**

This year international scientific conference on April 24-25 is organised by the Department of Accounting and Finances of the **Faculty of Economics**, Latvia University of Agriculture. Every year the number of participating universities and scientific institutes increases. Professors, associate professors, assistant professors, PhD students and other researchers from the following higher education institutions participate in this conference and present their results of scientific researches:

1. Latvia University of Agriculture
2. Technological Educational Institute of Thessaloniki
3. Lithuania University of Agriculture
4. Aristotle University of Thessaloniki
5. Swedish University of Agricultural Sciences
6. University of Helsinki
7. University of Padova
8. University of Venice
9. University of Latvia
10. Austria Federal Institute of Agricultural Economics
11. Agricultural University of Krakow
12. Agricultural University of Szczecin
13. Academy of Agricultural and Forestry Sciences of Latvia
14. University of Technology and Life Sciences in Bydgoszcz
15. Daugavpils University
16. Estonian University of Life Sciences
17. Latvian State Institute of Agrarian Economics
18. Association of Farmers of Latvia
19. Federal Institute for Less-Favoured and Mountainous Areas, Austria
20. Riga Technical University
21. University of Bonn
22. Warsaw University of Life Sciences
23. Latvia University of Agriculture, Faculty of Economics
24. Kaunas University of Technology
25. Estonian University of Life Sciences
26. Research Institute of Biotechnology and Veterinary Medicine “Sibra” of Latvia University of Agriculture
27. University of Warmia and Mazury in Olsztyn
28. University of Tartu
29. Fulda University of Applied Sciences
30. Research Institute of Agriculture Machinery of Latvia University of Agriculture
31. Rēzekne Higher School.

The international scientific conference was announced in June, 2007. All the proceedings are arranged according to 10 thematic units:

1. Efficiency of production in primary and secondary sectors of agriculture;
2. Rural development and globalization;
3. The effects of financial support;
4. Regional agriculture in the contexts of specialisation and globalisation;
5. Cooperation and integration;
6. Rural mentality and development of the culture in rural areas;
7. The role of information in rural development;
8. Management of rural development;
9. Quality of life and environment in rural areas;
10. Changes of consumption in rural areas.

These themes are arranged in three volumes.

To ensure that only high-level scientific and methodological research results, meeting the requirements of international standards, are presented at the conference, comprehensive reviewing of submitted scientific articles has been performed on international and inter-university level. The majority of reports are in English.

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 the authors of the report. Every reviewer received manuscripts without the authors' names, while every author received the reviewers' comments and objections.

After receiving the improved (final) version of the manuscript the Editorial Board of this conference evaluated each report.

All the papers of the international scientific conference "Economic Science for Rural Development" are arranged into the following thematic volumes:

- 15. Regional and Rural Development;**
- 16. Primary and Secondary Production, Consumption;**
- 17. Finances, Taxes, Investment and Support Systems.**

The researches and their results of the conference proceedings are now available to a wide circle of readers in the European Union. We hope that the readers will enhance the possibilities of the new EU countries. The publishing of the proceedings before the conference will also promote this process, exchange of opinions and collaboration of economic scientists on international level. The proceedings can be used by students and any interested person.

**The abstracts of the conference proceedings provided in English are submitted to international databases: AGRIS (*International Information System for the Agricultural Sciences and Technology*) and EBSCO, which is one of the largest electronic resource databases in the USA.**

We thank all the authors, reviewers, members of the Editorial Board and supporting staff. Especially we want to thank the Ministry of Agriculture of the Republic of Latvia, the Rural Support Service and the printing house "Jelgavas tipogrāfija" for the comprehensive support in publishing the scientific proceedings and organisation of international conference.

On behalf of the conference organisers

**INGRĪDA JAKUŠONOKA**

**professor of the Faculty of Economics, Latvia University of Agriculture**



## **Priekšvārds**

Latvijas Lauksaimniecības universitātes (LLU) Ekonomikas fakultātē līdz ar ikgadējo, tradicionālo starptautisko zinātnisko konferenci „**Ekonomikas zinātne lauku attīstībai**” iznāk tajā prezentējamo pētījumu starptautiski recenzētie zinātniskie raksti. Šo konferenču rīkošana kļuvusi regulāra. Tajās piedalās liels skaits ekonomikas zinātnieku no daudzām Eiropas valstīm. Konference veltīta aktuālai lauku attīstības tematikai, tādēļ iznāca trīs secīgi laidieni (Nr.15., 16. un 17.). Šādu zinātnisko rakstu pirmais laidiens iznāca 2000. gadā.

**Konferences rīkošanu un zinātnisko rakstu izdošanu atbalstīja Latvijas Republikas Zemkopības ministrija.**

**2008. gada 24. un 25. aprīļa starptautiskajā zinātniskajā konferencē piedalās** un savus zinātnisko pētījumu rezultātus prezentē profesori, zinātņu doktori, asociētie profesori, docētāji, doktoranti un citi pētnieki no šādām augstskolām un zinātniski pētnieciskajām iestādēm:

- Latvijas Lauksaimniecības universitātes
- Saloniku Tehnoloģiju institūts
- Lietuvas Lauksaimniecības universitātes
- Saloniku Aristoteļa universitāte
- Zviedrijas Lauksaimniecības zinātņu universitātes
- Helsinku universitātes
- Padujas universitāte
- Venēcijas universitāte
- Latvijas Universitātes
- Austrijas Lauksaimniecības agrārās ekonomikas institūts
- Krakovas Lauksaimniecības universitātes
- Ščecinas Lauksaimniecības universitātes
- Latvijas Lauksaimniecības un Meža zinātņu akadēmijas
- Bydgoszcz Tehnoloģiju un dzīvības zinātņu universitāte
- Daugavpils universitātes
- Igaunijas Dzīvības zinātņu universitātes
- Latvijas Valsts agrārās ekonomikas institūta
- Austrijas Mazāk labvēlīgo un kalnaino apgabalu institūts
- Rīgas Tehniskās universitātes
- Bonnas universitātes
- Varšavas Dzīvības zinātņu universitāte
- Latvijas Lauksaimniecības universitātes Ekonomikas fakultātes
- Kauņas Tehnoloģiju universitātes
- Igaunijas Dzīvības zinātņu universitāte
- LLU Biotehnoloģiju un Veterinārmedicīnas pētniecības institūts „Siga”
- Varmijas un Mazūrijas universitātes Olzstinā
- Tartu universitātes
- Fuldas profesionālās universitātes
- LLU Lauksaimniecības mašīnu pētniecības institūts
- Rēzeknes augstskola.

Starptautiskā zinātniskā konference tika izsludināta 2007. gada jūnijā. Tai izvēlēti 10 aktuāli temati:

11. Ražošanas efektivitāte lauksaimniecības primārajā un sekundārajā sfērā
12. Lauku attīstība un globalizācija
13. Lauku ekonomiskā un sociālā attīstība
14. Finansiālā atbalsta efektivitāte
15. Reģionālā lauksaimniecība specializācijas un globalizācijas kontekstos

16. Kooperācija un integrācija
17. Lauku mentalitāte un kultūras attīstība laukos
18. Informācijas loma lauku attīstībā
19. Lauku attīstības menedžments
20. Dzīves un vides kvalitāte laukos
21. Patēriņa izmaiņas lauku attīstībā

Šie temati ietilpināti trīs zinātnisko rakstu laidienos.

Starptautiskās zinātniskās konferences zinātniskuma un starptautiskiem standartiem atbilstošu zinātnisko darbu prezentēšanas nodrošināšanai veikta vispusīga iesniegto zinātnisko rakstu starptautiska un starpaugstskolu recenzēšana. Šajā nolūkā lielākā daļa zinātnisko rakstu ir angļu valodā.

Katru iesniegto zinātniskā raksta manuskriptu vērtēja (recenzēja) parasti viens autora valsts recenzents un otrs – citas valsts vai citas augstskolas recenzents. Pretrunīgu recenziju gadījumā darbs tika nodots vēl trešajam recenzentam. Recenzenti darbu autoriem bija anonīmi, arī redkolēģija recenzentiem nodeva darbus bez autoru uzvārdiem.

Katram autoram tika nosūtīti recenzentu iebildumi vai ieteikumi. Pēc uzlabotā (galīgā) varianta un autora paskaidrojuma saņemšanas katru zinātnisko rakstu vērtēja šīs konferences zinātnisko rakstu redkolēģija.

Starptautiskās zinātniskās konferences „Ekonomikas zinātne lauku attīstībai” visi zinātniskie raksti sakārtoti trijos tematiskos rakstu laidienos:

**Nr. 15. Reģionālā un lauku attīstība**

**Nr. 16. Primārais un sekundārais sektors, ražošana, patēriņš**

**Nr. 17. Finanses, nodokļi, investīcijas un atbalsts**

Zinātniskajos rakstos izklāstītie pētījumi un to rezultāti kļūst pieejami plašam interesentu lokam Eiropas Savienības telpā. Ceram, ka tie aktualizēs jauno Eiropas Savienības valstu iespējas. Rakstu publicēšana pirms konferences sekmēs tās norisi, domu apmaiņu, ekonomikas zinātnieku starptautisko sadarbību. Rakstus varēs izmantot studējošie un visi interesenti.

**Konferences zinātnisko rakstu kopsavilkumi angļu valodā tiek izsūtīti starptautiskām datu bāzēm: AGRIS (*International Information System for the Agricultural Sciences and Technology*) un EBSCO - vienu no lielākajām ASV elektronisko resursu datu bāzēm.**

Ceram saņemt atsauksmes un priekšlikumus turpmāko zinātnisko rakstu izdevumu sagatavošanai un starptautisko zinātnisko konferenču rīkošanai.

Pateicamies visiem rakstu autoriem, recenzentiem, programmas komitejai, redkolēģijai un tehniskajam personālam. Sevišķs paldies Latvijas Republikas Zemkopības ministrijai, Lauku atbalsta dienestam un Jelgavas tipogrāfijai par vispusīgu atbalstu zinātnisko rakstu izdošanā un starptautiskās konferences rīkošanā.

Konferences orgkomitejas vārdā

**INGRĪDA JAKUŠONOKA**

**Latvijas Lauksaimniecības universitātes Ekonomikas fakultātes profesore**

## **CONTENT**

<b>1. Astra ASEJEVA, Nikolajs KOPIKS, Dainis VIESTURS</b>	<b>14</b>
<b>Application of economic-mathematical simulation for the choice of the technical support of technologies of agricultural crops</b>	
<b>2. Aina BRIGE</b>	<b>20</b>
<b>Development of Study Process and Human Resources – Main Factors for the Provision of University Education Quality</b>	
<b>3. Katarzyna BRODZIŃSKA</b>	<b>27</b>
<b>Conditions of Agri-environmental Programme Implementation in Poland</b>	
<b>4. Veronika BUĞINA, Kristīne MUKTUPĀVELA</b>	<b>33</b>
<b>Assessment of Agricultural Development in the Region of Latgale</b>	
<b>5. Marta DOMAGALSKA-GRĘDYS</b>	<b>44</b>
<b>Use of Checklists Method for an Assessment of the Stages of Organizational Development</b>	
<b>6. Barbara GOŁĘBIEWSKA</b>	<b>49</b>
<b>Rural Tourism as a Form of Non-farming Business Activity in the Polish Countryside</b>	
<b>7. Jarosław GOŁĘBIEWSKI</b>	<b>56</b>
<b>Marketing Channels on the Food Market in Poland (on the Example of Cereal Sector and Vegetables Fats)</b>	
<b>8. Uldis IVANS</b>	<b>63</b>
<b>Research on 5 Dimensions Cultural Model in the Regions of Latvia</b>	
<b>9. Uldis IVANS</b>	<b>70</b>
<b>Land Market in Zemgale Region</b>	
<b>10. Kristīne JARVE, Ineta GEIPELE</b>	<b>75</b>
<b>Recently Implemented Inflation Combating Measures and their Impact on Rural Development in Latvia</b>	
<b>11. Eva LIEPIŅA</b>	<b>83</b>
<b>Development of the Pharmaceutical Network in Rural Regions of Latvia and Pharmaceutical Reimbursement</b>	

12.	<b>Heikki MÄKINEN, Matti YLÄTALO</b>	<b>91</b>
	<b>Strategic Orientation behind the Success of Finnish Family Farms</b>	
13.	<b>Monika MEJSZELIS</b>	<b>100</b>
	<b>Influence of the Bonitation Value and Sold Area on the Single Price of Arable Lands Sold from the Resources of State Agricultural Property</b>	
14.	<b>Ligita MELECE, Dina ROMANOVA</b>	<b>108</b>
	<b>Implementation Issues of Genetically Modified Organism's, the EU Policy and Development of Biosafety System in Latvia</b>	
15.	<b>Ligita MELECE, Dina ROMANOVA, Aleksandrs GOLOVČENKO</b>	<b>115</b>
	<b>Food Consumption Trends and its Influencing Factors in Latvia</b>	
16.	<b>Malgorzata MICHALCEWICZ</b>	<b>123</b>
	<b>Methods of Professional Activation for the Unemployed in Agricultural Areas within the Project of the Community Initiative EQUAL (Part 2)</b>	
17.	<b>Antoni MICKIEWICZ , Bartosz MICKIEWICZ</b>	<b>129</b>
	<b>Meaning of Transborder Cooperation in the Development of Western Borderland in Poland</b>	
18.	<b>Maire NURMET, Anne PÕDER, Jüri LEHTSAAR, Rando VÄRNIK, Enn PLAAN, Peedu ZEIGER, Ülar LOOLAID</b>	<b>134</b>
	<b>Awareness and Managing of Agricultural Cross-compliance Standards in Estonia</b>	
19.	<b>Baiba OŠMANE, Sallija CERIŅA</b>	<b>142</b>
	<b>Influence of Cows Keeping Way on Feed Making Expenses</b>	
20.	<b>Inese OZOLA</b>	<b>148</b>
	<b>Opportunities for Raising the Labour Market Offerings in Latgale within the Framework of the Centres of Regional Meaning</b>	
21.	<b>Irina PILVERE</b>	<b>157</b>
	<b>The Profile of Agriculture and its Largest Enterprises in Latvia</b>	
22.	<b>Agnese RADŽELE-ŠULCE, Kazimirs ŠPOĢIS</b>	<b>165</b>
	<b>Application of Logistics Methods and Instruments in the Forestry Products Circulation</b>	

23.	<b>Baiba RIVŽA, Maiga KRŪZMĒTRA, Dace VĪKSNE</b>	<b>174</b>
	<b>Attractiveness of Living Space and Regional Higher Education Institutions</b>	
24.	<b>Sanita SPRUĢE</b>	<b>181</b>
	<b>Systems of Ecolabelling in Latvia and the EU</b>	
25.	<b>Elżbieta SZYMAŃSKA</b>	<b>188</b>
	<b>Sources of Feed Supply in Comparison with the Effectiveness of Pig Production</b>	
26.	<b>Eve TOMSON, Andro ROOS</b>	<b>196</b>
	<b>Importance of Estonian Forest Management Societies in the Context of New Political Economy</b>	
27.	<b>Seppo VEHKAMÄKI, Matti YLÄTALO, Eetu ARO</b>	<b>203</b>
	<b>Resource Use and Entrepreneurship on Dairy Farms in South Ostrobothnia (Finland)</b>	
28.	<b>Anastasija VILCIŅA, Linda GRINĒVIČA</b>	<b>210</b>
	<b>Problems of Attracting Employees and their Solution at Bread Producing Enterprises</b>	
29.	<b>Līga VINDELE, Veronika BUĢINA</b>	<b>217</b>
	<b>Evaluation Methods of Natural Resources in Latvia</b>	
30.	<b>Ira Irena VĪTIŅA, Vera KRASTIŅA, Jānis MIČULIS, Sallija CERIŅA</b>	<b>229</b>
	<b>Economic Aspects for the Application of Extruded Rapeseed Oilcake in Poultry Feeding</b>	
31.	<b>Ludwik WICKI</b>	<b>235</b>
	<b>Seed Market in Poland - Brilliant Future or Stagnation</b>	
32.	<b>Małgorzata ZAJDEL</b>	<b>242</b>
	<b>Methods of Professional Activation for the Unemployed in Agricultural Areas within the Project of the Community Initiative EQUAL (Part 1)</b>	
33.	<b>Andra ZVIRBULE-BĒRZIŅA, Aldis GAILĪTIS</b>	<b>248</b>
	<b>Assessment of the Possibilities to Use Outsourcing in Production of Food Products</b>	

## **Application of Economic-mathematical Simulation for the Choice of the Technical Support of Technologies of Agricultural Crops**

Astra Asejeva, Department of Business and Management, Latvia University of Agriculture  
Nicolajs Kopiks, Dainis Viesturs, Research Institute of Agriculture Machinery, Latvia University of Agriculture,  
e-mail: [uzc@delfi.lv](mailto:uzc@delfi.lv)

### **Abstract**

The article deals with the issue how to choose a tractor aggregate by means of the method of economic-mathematical simulation; a model is presented in which energetic indices are considered, which allow to take into account the energy balance (the capacity of the tractor required for the agricultural machine) when the optimum costs are determined. This provides a possibility to consider the optimum load of the tractor engine, its efficiency and the fuel economy in the optimisation process. A computer software MS Excel Solver was used for the calculation of the mathematical model solving it as an optimisation task of nonlinear programming. The choice of a tractor aggregate is discussed as an example for the preparation of soil under cereals using machines from the TopDown range (the VÄDERSTAD Company).

**Key words:** Optimisation, specific costs, operating width, aggregate, economic-mathematical simulation

### **Introduction**

In order to effectuate the cultivation technology of agricultural crops, an optimum technical support is necessary. The results of its implementation will depend, to a great extent, on how valid is the choice of the tractor aggregates with an aim to ensure the best agrotechnical terms, the quality of work, high efficiency, lower fuel consumption, reduction of costs and economic efficiency.

To solve this task, the method of economic-mathematical simulation may be applied, which is used for the optimisation of agricultural processes.

### **Materials and methods**

The aim of the present study is to develop a method, as well as an economic-mathematical model, for the choice of optimum variants of tractor aggregates taking into account the energy balance (the capacity of the tractor required for the agricultural machine) according to the criteria of optimum costs. Another aim of this article is to offer information to the producer of agricultural products so that he could make more valid choice of a tractor aggregate taking into account the requirements and conditions of his farm when modifying and adapting new cultivation technologies of agricultural crops.

To build an economic-mathematical model, a method of parametrical optimisation of functional dependencies was applied reflecting the character of the investigated process [1, 2]. The functional dependencies were established on the theoretical basis of completing machine-and-tractor aggregates [3].

### **Results and discussion**

The offered method for the choice of the technical support of a technology presumes a selection of aggregates from the entire possible range in order to perform technological operations based on technical characteristics according to the following diagram (Fig. 1).

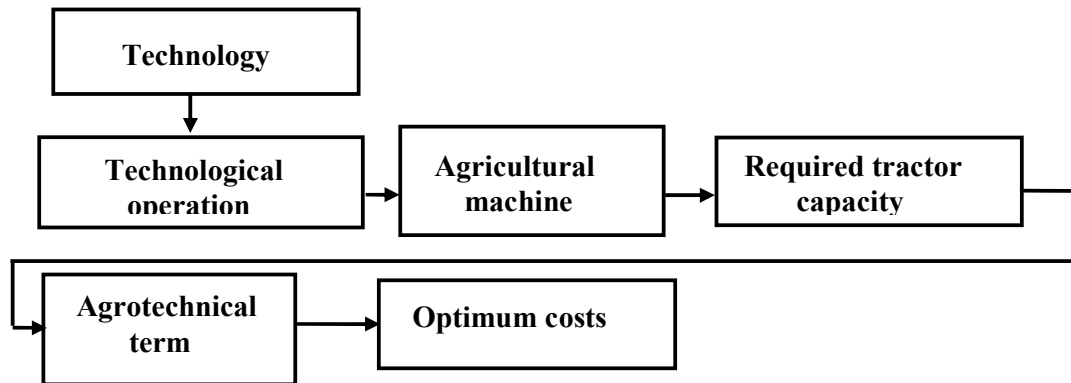


Figure 1. The choice of an optimum aggregate by the criterion of minimum costs

The process of the choice is carried out in the following order.

3. A technological operation is selected from the discussed technologies for the performance of which it is necessary to determine the optimum aggregate.
4. The type of an agricultural machine and its technical characteristics are selected from the range of agricultural machines.
5. In order to aggregate the agricultural machines with tractors by the loss of their capacity, the energy equipment is selected.
6. Time is set for the completion of the work within the fixed agrotechnical terms.
7. A mathematical model is applied for the choice of an optimum aggregate by the criterion of costs.

The mathematical model for the solution of the task in the form of a structural scheme is presented in

Figure 2.

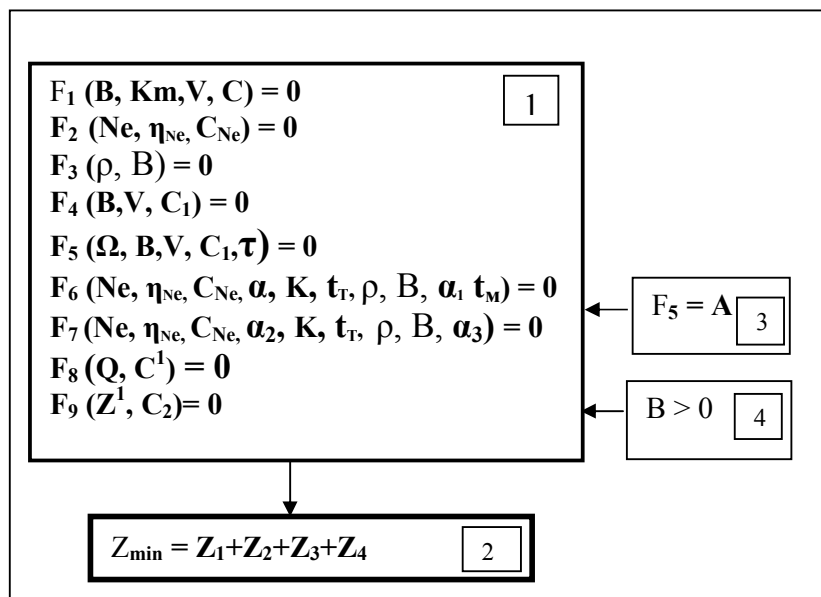


Figure 2. The structural scheme of the mathematical model for the choice of a tractor aggregate

The structural scheme of the mathematical model for the choice of a tractor aggregate by the optimisation criterion of costs, presented in Figure 1, includes Block 1 which has 9 basic equations and in

which, according to these equations, selection of optimum correspondences of parameters is made and sent to Block 2 where the optimisation criterion  $Z_{\min}$  is defined. Equations:  $F_1$  - represents the required capacity for the aggregation of an agricultural machine;  $F_2$  - the cost of efficiency;  $F_3$  - the price of the agricultural machine;  $F_4$  - the output of the aggregate;  $F_5$  - the duration of the performed work;  $F_6$  - the depreciation deductions for the aggregate;  $F_7$  - deductions for repairs and maintenance of the machines;  $F_8$  - specific costs of fuel;  $F_9$  - the costs of salaries;  $Z_{\min}$  - specific costs.

The values of the equations have the following designations:  $N_e$  - the capacity of the energy equipment;  $B$  - the operating width of the agricultural machine;  $K_m$  - the specific resistance of the machine;  $V$  - the technological speed of the aggregate;  $\Omega$  - the amount of work;  $\tau$  - the length of the working day;  $C_1$  - the conversion coefficient of the values in different systems of units;  $\eta_{N_e}$  - the capacity factor of the tractor engine;  $C_{N_e}$  - the specific capacity cost;  $p$  - the specific cost of agricultural machines;  $A$  - the agrotechnical term of the performed operation;  $\alpha$ ,  $\alpha_1$  - the deduction percent for the depreciation of the energy equipment and the agricultural machine;  $t_r$ ,  $t_m$  - the annual load of the energy equipment and the agricultural machine;  $K$  - the ratio of an individual operation in the entire annual amount of work;  $\alpha_2$ ,  $\alpha_3$  - the deduction percent for the repairs and maintenance of the machines;  $Q$  - the specific fuel consumption;  $C^1$  - the cost of fuel;  $Z^1$  - specific costs of a technological operation in man-hours;  $C_2$  - the payment by the hour;  $Z_1$  - the costs of the depreciation deductions;  $Z_2$  - the costs of repairs and maintenance of the machines;  $Z_3$  - the costs of fuel;  $Z_4$  - the salary costs.

Defining the optimum specific costs by means of the mathematical model discussed above is carried out in the following order: different values are taken for the operating width  $B$  of the agricultural machine, and equations from Block 1 are solved for each value; besides condition  $B \geq 1$  must be satisfied; on the basis of the values obtained after the solution of the equations from Block 1 and satisfying the conditions of restrictions from Block 3 ( $F_5 = A$ ) and Block 4 ( $B > 0$ ) the minimum costs  $Z_{\min}$  are determined (Block 2). If the value of the criterion  $Z_{\min}$  is not reached, then the other values of parameter  $B$  are calculated. At an optimum value of the criterion  $Z_{\min}$  the parameters, which characterise  $N_e$  and  $B$  of the tractor aggregate, will also be optimal for the established restrictions.

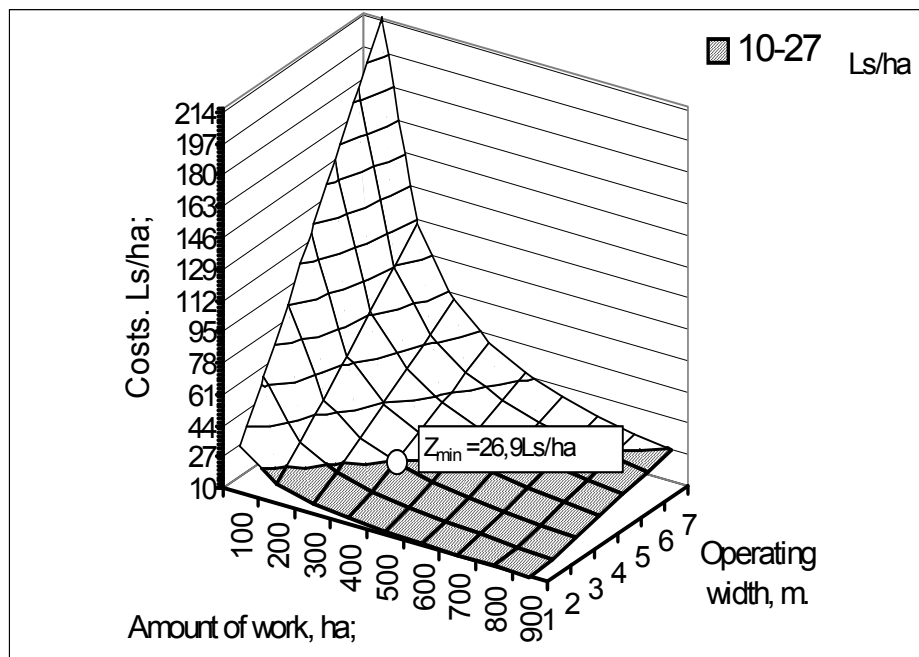
The given model is nonlinear, and it is solved by means of the method of nonlinear programming using MICROSOFT EXCEL and corresponding applications.

The choice of a tractor aggregate is discussed as an example for the preparation of soil under cereals. The amount of the performed work is equal to 400 ha, its agrotechnical term is 10 days. The basic input data: a type of an agricultural machine from the TopDown range (the VÄDERSTAD Company) is chosen for the soil preparation, the technological speed of the aggregate - 13 km/h. The information about the cost and the draft resistance of the agricultural machines is obtained from the distributors of this machinery. The cost of one metre of the operating width of the machine is LVL 10525, the mean fuel consumption per one horsepower is 156 g, the mean cost of one horsepower is LVL 322, and the annual load of the energy equipment is 1350 h (assumed for the McCormick series of tractors in the range from 37.5 to 280 HP). The percentage of the appreciation deductions of the energy equipment and the agricultural machine is 17%, that of the repairs and maintenance of the machines is 10% and 12% respectively.

As a result of the solution of the present model an optimum value of the operating width (3.08 m), as well as the required capacity (185.19 HP) of the agricultural machine are obtained according to which the energy equipment (a tractor) and optimum costs (26.96 LVL/ha) are chosen for a particular amount of work in fixed agrotechnical terms (10 days).

Figure 3 shows variations in the costs of the discussed model allowing the choice of an aggregate for the preparation of soil under cereals, depending on the operating width of the machine and the amount of work.



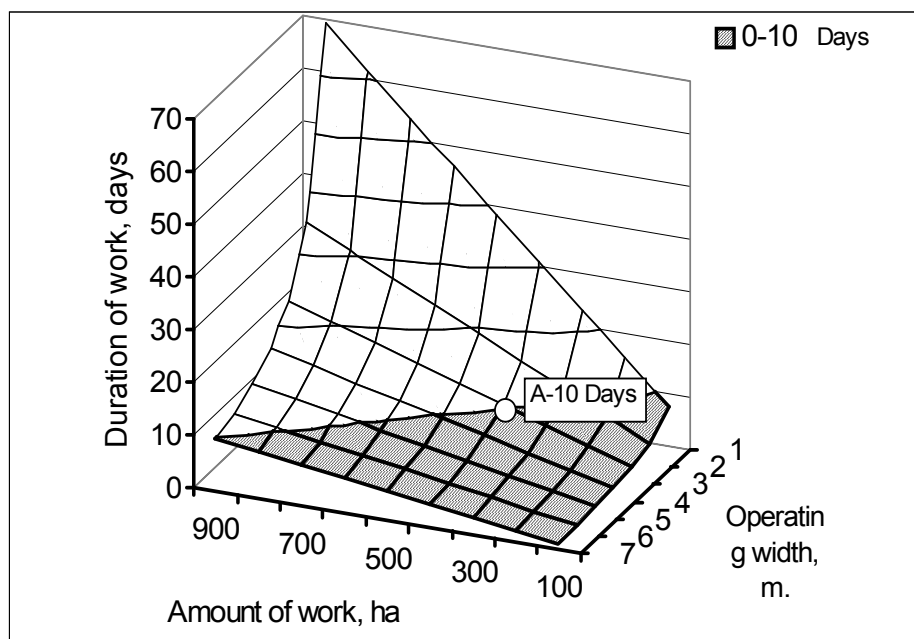


**Figure 3. Variations in the costs depending on the operating width of the machine and the amount of work**

The crosshatched region of the graph shows variations in the costs of within the limits from 10 to 27 LVL/ha depending on the operating width of the machine, the amount of work and their corresponding values  $F_1 \dots F_9$ . In this region the costs of values are optimum costs  $Z_{\min} = 26.96$  Ls/ha with the coordinates ( $B = 3.08$  m,  $\Omega = 400$  ha) for the fixed 10-day agrotechnical term. It is also evident from the graph that these costs vary with the operating widths and amounts of work. When the operating width of the machine and its amount of work increases, these costs decrease.

Variations in the agro-technical terms depending on the discussed parameters ( $B, V, \Omega, \tau, \dots$ ) and the functional dependencies ( $W = 0.1 VB$ ,  $t_m = \Omega / W$ ,  $A = (\Omega / W) / \tau$ ,  $A \leq 10$ ) of the discussed model allowing to choose a tractor aggregate for the preparation of soil under cereals has a mutual connection with the calculation of the optimisation criterion  $Z_{\min}$ . Figure 4 presents variations in the value of the agro-technical term in the solution process of the task.

It is evident from Figure 3 that the performance time decreases when the operating width of the aggregate increases, while the specific costs increase for small amounts of work. The value of the fixed agrotechnical term (0 – 10 days), in accordance with the set task, is located in the crosshatched region of the graph. The operating width  $B = 3.08$  m and the amount of the performed work  $\Omega = 400$  ha correspond to the value of the fixed agrotechnical term (10 days). The same values relate also to the optimum value of the costs  $Z_{\min}$  (Fig. 3), which points to the fact that they were determined taking into account the established restrictions.



**Figure 4. Variations in the value of the agrotechnical term depending on the operating width and the amount of the performed work**

It is obvious from graphs (Figures 3 and 4) that the above-mentioned parametric characteristics of the model for the choice of a tractor aggregate ensure the selection of their values in accordance with the established restrictions. Besides the efficiency index (the costs) correspond to the minimum value of all its possible values. It is also evident from the graphs that the established restrictions, the agrotechnical terms, and the amount of the performed work limit the number of additional solutions which ensure the minimum value of the specific costs. Therefore, when the mathematical model is worked out, the choice of restrictions should correspond to a strictly allowed value of the discussed process (the efficient implementation of the technology).

The presented model for the choice of a tractor aggregate has a distinctive feature: in contrast to the other models, its parametric characteristics and their functional dependency reflect the energy balance (the capacity of the tractor required for the agricultural machine) in the selection process. This is important because optimum load of the engine is supposed in choosing the values of the variables, which promotes a decrease in the specific fuel consumption, and this, in its turn, has a lesser impact on the natural environment and saves the energy resources.

The choice of a tractor aggregate according to the cost criterion ( $Z_{\min}$ ), taking into account the energetic characteristics ( $N_e$ ,  $K_m$ ), considers the level of the rated capacity in the process in order to ensure optimum load of the engine. This, in its turn, ensures high efficiency of the aggregate, and minimum fuel consumption.

### Conclusions

1. The discussed model for the choice of a tractor aggregate, including energetic indices in the structure of its parametric characteristics, allows obtaining an energetically balanced tractor aggregate with optimum costs.
2. In the defining process of optimum costs the model considers the level of the rated capacity, which ensures optimum load of the energy equipment (tractor), which has an impact on the possible

efficiency of the aggregate and the fuel consumption, the value of which affects not only the costs, but also the natural environment.

3. The presented model allows making valid decisions for the choice and purchase of machine-and-tractor aggregates, and the formation of the structure of the energy equipment on the farm.

### **References**

1. Дж. Франс, Дж. Х. М. Торили. Математические модели в сельском хозяйстве. Пер. с англ. – Москва: Агропромиздат, 1987.- 400 стр.
2. Таха, Хемди А. Введение в исследование операций 7-е издание.: Пер. с англ.- Москва.: Издательский дом «Вильямс», 2005.- 912 стр.
3. С. А. Иофинов, Эксплуатация машинно-тракторного парка. М. «Колос», 1974г. 473 стр.
4. A. Asejeva, N. Kopiks, D. Viesturs THE CHOICE OF AN OPTIMUM PLOUGHING AND SOWING AGGREGATE FOR DIFFERENT AMOUNTS OF WORK. Proceedings of the International Scientific Conference “Economic Science for Rural Development,” № 10. Jelgava: 2006. 139...144 pp.

### **Kopsavilkums**

#### **Ekonomiski matemātiskā modeļa izmantošana lauksaimniecības kultūru audzēšanas tehnoloģiju tehniskā nodrošinājuma izvēlei.**

**Astra Asejeva**, Department of Business Management LUA,  
**Nikolajs Kopiks, Dainis Viesturs**, Research Institute of Agriculture Machinery LUA, e-mail:  
[uzc@delfi.lv](mailto:uzc@delfi.lv)

Lauksaimniecības tehniskā nodrošinājuma augstais līmenis, dažādu augstražīgu agregātu ar atšķirīgiem tehniski ekonomiskiem rādītājiem piedāvājums lauksaimnieciskās produkcijas ražotājiem izvirza uzdevumu: veikt agregāta pamatotu izvēli konkrētiem saimniecības apstākļiem. Sakarā ar to rodas nepieciešamība izstrādāt efektīvas agregātu izvēles metodes, ņemot vērā to izmantošanas apstākļus.

Rakstā pētīts traktoru agregātu (traktors + darba mašīna) izvēles jautājums, izmantojot ekonomiski matemātiskās modelēšanas metodi, parādīts modelis, kurā ietverti enerģētiskie rādītāji, kas ļauj, nosakot optimālās mainīgās izmaksas, ievērtēt enerģētisko bilanci – saskaņot traktora jaudu ar mašīnas prasībām. Tas dod iespēju izvēles procesā ņemt vērā optimālo motora noslodzi, darba ražīgumu un degvielas patēriņu. Tā kā pie mainīgo lielumu vērtību izvēles ņemta vērā motora optimālā noslodze, samazinās degvielas izmaksu īpatsvars, savukārt optimālā motora noslodze rada mazāku iedarbību uz apkārtējo dabas vidi un dod energoresursu ekonomiju.

Piedāvātā traktoru agregātu izvēles metode, izmantojot ekonomiski matemātisko modeli, ļaus noteikt optimālo tehniskā nodrošinājuma variantu jaunu lauksaimniecības kultūru audzēšanas tehnoloģiju izstrādē, kā arī sniegs informāciju lauksaimniecības produkcijas ražotājiem, pamatotai traktoru agregātu izvēlei, ievērojot dažādas prasības un saimniecības apstākļus.

Matemātiskā modeļa aprēķinā izmantotas programmas MS Excel, Solver, atrisinot to kā nelineārās programmēšanas optimizācijas uzdevumu. Kā piemērs parādīta augsnes sagatavošanas agregāta izvēle graudaugu sējai, izvēloties optimālu TopDown (VÄDERSTAD) agregātu.

## **Development of Study Process and Human Resources – Main Factors for the Provision of University Education Quality**

**Aina Brīģe**

Mg.oec., Mg.paed., Latvia University of Agriculture

### **Abstract**

Education is one of the most important preconditions for cultural and sustainable economic development as well as for raising the standard of living.

Quality supplement is a comprehensive notion, which includes politics, processes and activities for the maintenance and development of the university education quality.

According to the Lisbon Diploma Recognition Convention, the existence of quality evaluation system for university education in the state and information of other states on its results is an essential condition for the acknowledgement of some state's diploma abroad.

The legislation of Latvia determines the quality evaluation of separate university study programmes and university in general once every six years. The evaluation of a study programme involves the analysis of planned contents and its practical implementation as well as planned contents of the faculty of a concrete study programme, its qualifications, and research done in the framework of the programme. The general evaluation of the university is targeted towards material resources of the university - library, computers, premises, catering and social supplement of students as well as organisational building, management and inner democracy of the university. In case of positive assessment, a study programme and particular university are accredited. Accreditation is a process which results in giving the rights to universities to attribute qualifications or to make decisions regarding the recognition of attributed qualifications by a competent institution. The competent institution can be the state itself or a state selected agency. Accreditation of the university in general can take place before the accreditation of its study programmes. Final result of the evaluation is the accreditation of the university. As result of the quality evaluation, universities win the rights to issue diplomas recognized by the state.

**Key words:** quality of higher education, education, development of human resources

### **Introduction**

To develop the space of European higher education by diminishing social inequality and distinctions of national development, European countries have agreed on important common aims of the development of higher education by 2010.

National reports of the member states witness that the introduction of the principles of Bologna process has progressed a lot. The announcements of the European Commission and the European Council appreciate the support by these organisations in the implementation of the processes. Nevertheless the enterprises have to ensure closer relations between higher education and science systems. The space of European university education, which is forming now, relates to gain benefits from collaboration with the space of European science, thus strengthening the basis of knowledge in Europe. Cultural richness and diversity of languages, which are rooted into the heritage of European multiform traditions, have to be maintained to succeed innovations potential, social and economic growth, basing on mutual collaboration of European universities.

**The aim** is to clarify the development tendencies of higher education of Latvia within the common process of European education convergence, and quality promotion of students and faculty.

#### **Tasks:**

- to summarise theoretical statements for the characterisation of education quality;
- to characterise the EU evaluation tendencies of higher education, and to summarise the most important indicators characterising the development of higher education systems in the EU and Latvia;
- to set prior directions and sectors for the introduction of the quality standards of higher education in Latvia.

## **Materials and Methods**

The main informative materials used in the analysis are as follows: the Bologna Declaration, reports of the Ministry of Education and Science on the activities of Latvia universities, the norms of the European Union (EU), international reports, other documents on higher education and the National Concept.

The monographic method- exploration of higher education based on wide bibliographical survey characterising the current state as well as the changes in the objects during the study; and the method of analysis is used to research formation and structure of the educational systems in Latvia and the EU states.

The correlation and regression methods were also used in the study.

## **Results and Discussion**

### **Concept of Education Quality**

Quality of is one of the cornerstones of education; although a lot of ambiguity and misunderstanding exist on the notion of quality. Part of the different quality definitions is better applicable to university education systems with dynamic and positive role in the society, culture and economy. Thus one has to make arbitrary choice of quality understanding; and this choice is going to influence further approach to the course of quality evaluation.

As Harvey L. and Green D. (1993, *Defining Quality, Assessment and Evaluation in Higher Education*) have already proved, the opportunities of quality understanding can be grouped into several categories, and the most important of them are as follows:

- Quality as “excellence”. It is traditional academic approach with the aim to be the best. This understanding of quality is often used by academicians and politicians debating on the quality of university education.

- Quality as “perfection” approach is the best applicable in mass production, where the necessary features of the product can be set in details, and where standardised measurements of uniform products can show their correspondence to the standards. University graduates cannot be considered as uniform, therefore this understanding of quality practically is not applicable in the sector of university education.

- Quality as “correspondence to the aimed”. One of the most important varieties, which can be found in the quality descriptive literature is that the chosen quality definition always has to be specific - quality for certain purpose. “Quality in general” does not exist. Regarding university education, this consideration on quality means, for instance, that some study programmes can be aimed towards the preparation of researchers but not professionals, practical work or vice versa. This consideration of quality includes the quality concept, which is aimed towards the “needs of clients” (sometimes called – interested parties) – although it can appear that it is not easy to define “clients” (students, employers, academic society, government as a society representative in general et al. clients) in higher education. The most important fault of this approach is that it leads to think that “anything fits” in university education if only it is possible to formulate a purpose. So the approach “correspondence to the aimed” has to be supplemented with the approach, which envisages “correspondence of the aim” to university education. In this sense, the correspondence of aims can be considered (and doubted), when evaluating quality, thus securing development.

- Quality as “change”. This approach is concentrated exactly on students: the better university, the more it meets the aim to give the students specific skills, knowledge and attitude they need for work and living in knowledge society. This approach includes the idea that the views and aims of the students are changing during the study process.

- Quality as a “threshold”. Setting of quality threshold means to define definite norms and criteria. Any department reaching or exceeding these norms and criteria has witnessed quality. The advance of setting threshold is that this approach is objective, certifiable and equal in the whole system of higher education. Its fault is that it is static - it is not applicable to changing circumstances if only using complicated political processes. Due to this reason, standards always lag. It means that using of quality concept as threshold does not stimulate quick adjustment to new opportunities, inclusion of new educational concepts or basing on new development level of discipline for the quality improvement.

A variant, which could be called the minimum standards, is used in the majority of European education systems. These minimum standards are often set quite generally: this approach envisages the necessity only to define quite widely desirable knowledge, skills and attitudes of the graduates. They secure definite minimum quality and definite minimum programme or comparability of the corresponding

departments within the university education system. All programmes or departments have to fulfil these minimum standards, achieve their special goals, and, trying to meet these goals, raise the quality.

- Quality as “development”. This approach emphasises the aspect of continuous development. It is centred on the idea that quality is essential for academic mentality, and that academic staff knows the best what is maximum quality at any moment. This approach emphasises duty of the academic environment, in the best meaning, to use its autonomy and academic freedom of the faculty. The fault of the approach of quality as improvement is that it is hard to make it objective (opposite to the conception of quality as “threshold”).

Quality procedures of Western Europe in university education are rather based on the quality as improvement than on the standards. In Latvia, the direction of university education is more often classified as “development for purpose”, namely:

- Quality of university education has to be defined in connection with concrete aims;
- These aims have to be adjusted to the concrete university education system;
- Different categories of clients (or “interested parties”) naturally have different views, “academic excellence” being one of those views;
- Students as prime users of university education are an important part of clients;
- University education becomes a mass fact, and the needs of students become more manifold;
- Due to the listed reasons, “aims” can be best defined in the level of separate universities, faculties or study programmes, and taking into account the context of the related state.

Recently education and its quality is experiencing great society attention. It can be understood, as exactly education potential is the uppermost in the development of any state. Unfortunately, characteristics of Latvia education situation sometimes are not concrete, therefore particular suggestions for the improvement cannot be offered. Only the introduction of quantitative measurement methods allows getting objective and numerous expressed characteristics on the efficiency of education system. In the Western world, such methods have been used already since the middle of the 1950s; however the scientists of Latvia started participating in such international programmes right after the renewal of the state independence.

#### **Tendencies of Quality Evaluation of University Education in the European Union**

Recently the most prominent projects in the sector of quality evaluation of university education are the following:

- European pilot project with the main aim to form understanding on the necessity of quality evaluation of university education, to enrich the quality evaluation procedures of each individual country, to share experience, and to introduce European dimension in quality evaluation. The pilot project was started to meet these goals using a unite method with national interpretations. The project included simultaneous evaluation of 46 universities in 17 countries;
- CRE Institutional evaluation with the aim to create evaluation as external diagnostic tool, which determines knot points and main acting people in daily decision making processes in universities, as far as they regard the quality and strategic guidance;
- PHARE Multinational project of the quality evaluation of university education with the main aims to promote collaboration of Central and Eastern European states in forming the quality evaluation systems of university education, and to secure correspondence of the development of individual countries to international quality evaluation standards.

Quality of higher education in the most of Central and Eastern European countries is determined by the accreditation – granting of the status, which points to the approval and recognition of a university, faculty or study programme. Governments have established accreditation systems to submit changing and in many aspects unstable systems of university education (especially in the countries with observed forming of new and private universities) to control. At the same time, the inner quality control systems of universities with the aim of institutional reform and development are not well known.

The accreditation process in Central and Eastern European countries has started after the changes of 1989 – 1991. Especially extensive development of this process was held in two directions:

- Europe level university education;
- development of private higher education.

In the states, where the accreditation is introduced, it is hard to judge from the official documents how it really works. Usually, the correspondence and state recognition of universities of accreditation, and

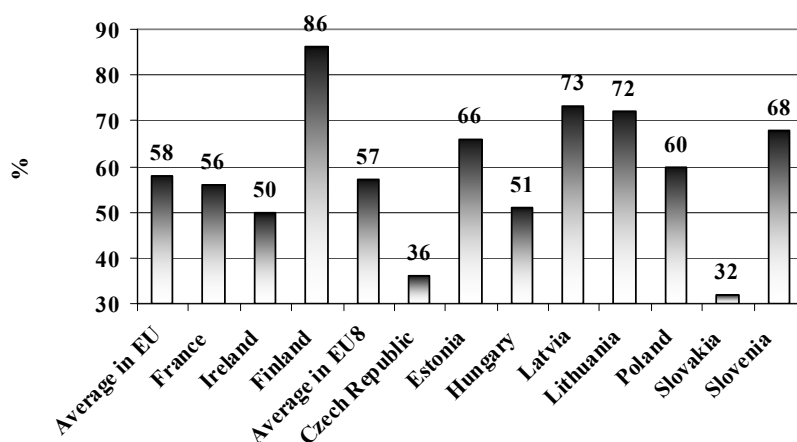
quality development is mentioned there. However practical balance of these aims depends on the procedures and their consequences, on external experts involved, and the way the universities perform their self – evaluation, and use its results. In some countries (for instance, the Czech Republic, Romania), there is tendency to emphasise input factors, and to check indicators rather than development aspects, while other countries (for instance, the Baltic states) work more with development factors.

### **Quality of university education of Latvia in comparison with the European Union countries**

The quality of university education in the state can be evaluated by several indicators:

- the number of higher schools graduates, who enter universities in five years period after the graduation of higher school;
- the number of graduates per 1000 inhabitants in the age group of 20 – 29;
- the share of population with university education of the total number of population in the age group of 25 – 64;

Latvia is one of the new European Union member states, therefore, in the research; the indicators of education quality in Latvia are mainly compared to the EU-8 countries.



**Figure 1. Gross enrolment rate (%) in the EU countries and the new students (%) of higher school graduates, who have entered university in five years period**

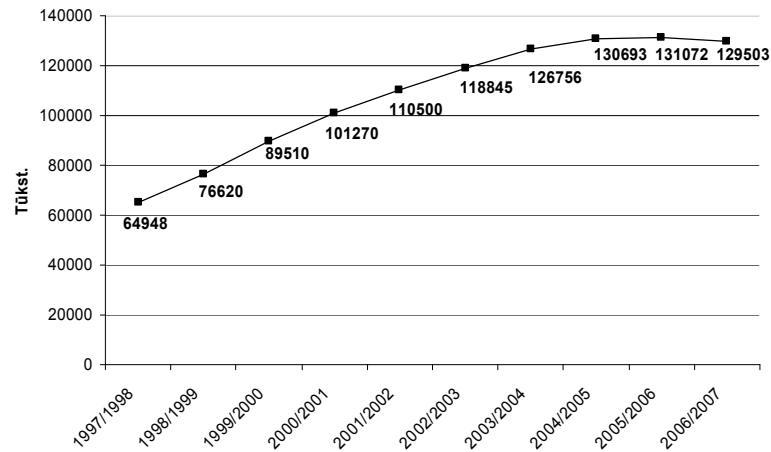
According to the indicator of the new students, Latvia has the second best rate – 73% of higher schools graduates enter university, and it shows the growing welfare level, socially economic circumstances in the state, the state offers university education available for everybody.

Total number of students in the academic year 2007/2008 equalled to 127050 students, which was by 2% less in comparison with the academic year 2006/2007. The total number of students has reduced due to the decrease of the number of part-time students in fee programmes in state universities.

The number of people willing to study has increased as well as the state budget financing has grown a lot. There is a situation formed in Latvia, when only part of the total number of students is financed from the state budget, while the others are studying for fee in private or state established universities.

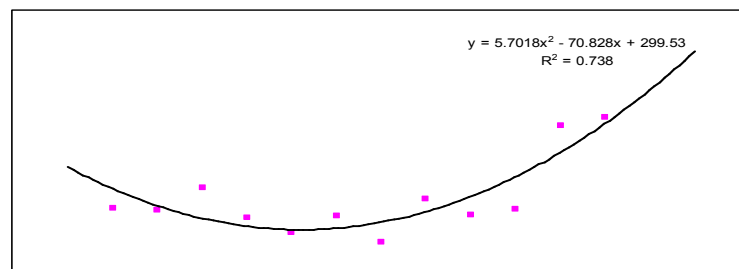
The regression analysis was performed to determine whether there is a direct connection between the number of university students and the state financing per one student, but it influences the attitude of students during the study process and quality of education.

The polynomial relation was established to evaluate the impact of several factors on the number of budget financed students in colleges and universities.



[survey, p. 57]

**Figure 2. The dynamics of the number of students in Latvia in the academic years 1997/1998 – 2006/2007**



[calculations done by the author according to the data of the report]

**Figure 3. Correlative relation between the state financing per one student and the number of budget financed students**

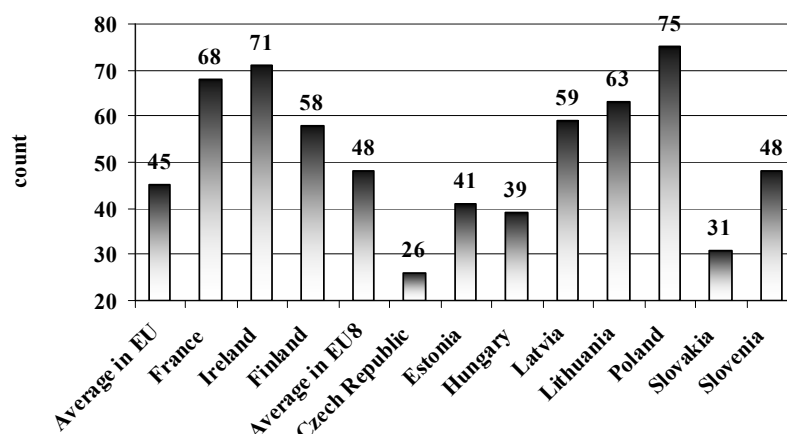
The evaluation of the results with F test proved that this model was important. More precise analysis on this connection led to the calculation of flexibility of functional coherence, thus:

**Equation 1**

$$E(y) = \frac{11.4x^2 - 70.83x}{5.7x^2 - 70.83x + 299.5}$$

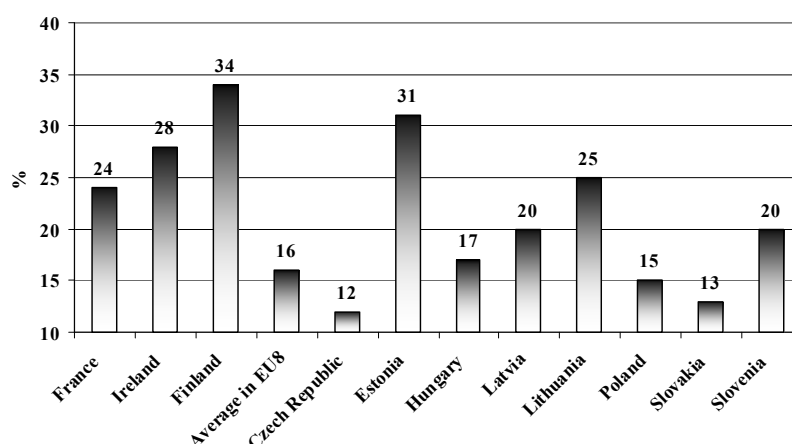
It means that increasing state financing per one student by 1%, and taking into account that budget groups are not completed in some specialities, it will increase by 2.01%.





**Figure 4. The number of tertiary graduates per 1000 inhabitants in the age of 20-29 in 2002**

The number of students per 1000 inhabitants shows the opportunities and will of the population to study at a university. This indicator for Latvia is 59; it is one of the highest, exceeding the average number of students per 1000 inhabitants in the European Union. It is very low in the Czech Republic and Slovakia, while the highest- in Poland and Ireland. The fact is interesting that the average number of students per 1000 inhabitants in the EU-8 countries is higher than the EU average.



**Figure 5. The share of population aged between 25 and 64 with higher education in 2004**

Intellectual potential of the state rises with the increase of the number of population with university education. The share of population with university education of the total number of population in Latvia is 20%, it is by 4% lower than the average indicator of the European Union member states, while in comparison with the EU-8 member states, and it is by 4% higher. Very low indicators are shown by the Czech Republic and Slovakia, but the highest ones are in Finland and Estonia.

## Conclusions

1. Latvia has the second best rate – 73% of the higher schools graduates entering university according to the indicator of the new students.

2. The number of students per 1000 inhabitants in Latvia is 59, it is one of the highest, exceeding the average number of students per 1000 inhabitants in the European Union.

3. There is no direct relation between the number of university students and state financing per one student, but it influences the attitude of students during the study process and quality of education.

4. The share of population with university education in Latvia is 20% of the total number of population, and it is by 4% lower than the average indicator of the European Union member states, but in comparison with the EU-8 member states, it is by 4% higher.

- To rise the quality of EU education by maximum usage of all resources.
- To increase the mobility and exchange among the EU member states, and to strengthen collaboration.

- To involve employers in the study process.

- To promote and develop opportunities of life long education in Latvia.

- To form open environment in the university education involving students in research.

The most important priorities of university education of the Republic of Latvia are provision of the EU quality standards basing on:

- elaboration of quality requirements and criteria according to the EU guidelines for quality provision in the European space of university education;

- forming and equalisation of institutional basis for quality management and monitoring of university education;

- elaboration of corresponding systems, procedures and order of mutual recognition of accreditation and diplomas;

- development of counselling forum involving European standard of university education, representatives of labour market, students, local government organisations of students and other interested parties in the exchange of experience and views.

### **References**

1. Accreditation of Studies. (2000), Berlin. (German);
2. Brunner Jose Joaquin. (2003), Higher Education: solutions of changeable circumstances, problems, tasks and politics. (Latvian);
3. Dobelis K. (2000), About quality of studies // Education in Latvia at the turn of the century: problems and solutions. Proceedings. LLU, 103. p.p. (Latvian);
4. Global Education Digest 2005 // UNESCO Institute for Statistics;
5. Haugs G., Tauhs K. Tendencies and structure of the studies in the higher education. Research about further progress (Latvian);
6. Haugs Gijs. (2001), Tendences uz studiju struktūru augstākajā izglītībā (Tendencies of Studies Structure in University Education) (II): pētījuma par tālāko virzību pēc Boloņas deklarācijas parakstīšanas; Sagatavots 2001. gada marta un maija Salamankas un Prāgas konferencēm / G.Haug, K. Tauns; tulk. A.Rauhvargers. – Rīgā,. – 60 lpp.;
7. Harvev L., Green D. (1993), Defining quality, Assessment and Evaluation in Higher Education, pp. 9-34;
8. Key Data on Higher Education in Europe 2007 // European Commission – Luxembourg – 173 lpp.
9. Pārskats par Latvijas augstāko izglītību 2007. gadā (Report on University Education of Latvia in 2007) // Latvijas Republikas Izglītības un zinātnes ministrija Augstākās izglītības departaments (2008) – Rīga – 275 lpp.

## Conditions of Agri-environmental Programme Implementation in Poland

Dr. agr. Katarzyna Brodzińska

Department of Agribusiness and Environmental Economics  
University of Warmia and Mazury in Olsztyn, Poland

### Abstract

The objective of the article is to recognize factors, which between 2004 and 2006 had an impact on agri-environmental implementation process in Poland in the context of the programme changes for the period 2007-2013. The research is based on the data of the Agency for Restructuring and Modernisation of Agriculture, the Central Statistical Office, the Main Trade Quality of Agricultural-Food Products Inspectorate, and results of own researches. The survey-using questionnaire was carried out in 2007 between 85 advisers from advisory centres, institutions and non-governmental organisations and private enterprises dealing with agricultural advisory.

The analysis showed that the inclination of farmers to implement agri-environmental packages was to a large extent determined by the amount of financial support and the requirements within variants of individual agri-environmental packages. The main reason for farmers to join the agri-environmental programme was financial benefit. The increase of the possibilities in which the programme can affect natural environment depends not only on the increase of means for individual undertakings, but also on the growth of the level of farmers' ecological awareness, as well as the existence of an efficient system of monitoring both positive and negative impact of farming on the environment.

**Key words:** agri-environmental programme, financial profit

### Introduction

The agri-environmental programme was introduced into the Common Agricultural Policy in 1992, as a result of the Mac-Sharry reform. This is an obligatory financial instrument implemented in all member states of the European Union. Its aim is to ensure integration of the agricultural development with the protection of environment, by minimizing negative results and maximising positive effects of agricultural use. Legal bases for creating agri-environmental programmes have been specified in the Council (EC) regulations<sup>1</sup>. Each of the member states prepares its own National Agri-Environmental Programme, which must be accepted by the European Commission.

In Poland, the National Agri-Environmental Programme 2004-2006 was implemented within the Rural Development Plan, and comprised seven packages: organic farming, buffer zones, protection of soil and water, protection of local breeds of farm animals, sustainable farming, maintenance of extensive meadows, and maintenance of extensive grassland. The first four packages could be implemented throughout the country, while the others only in the so-called priority zones<sup>2</sup> (PROW 2004). A fundamental difference between the agri-environmental programme developed for Poland and programmes of the most EU countries consists in the fact that in our country the focus is on the preservation of the current condition of natural environment, while in the Western countries – on the restoration of environmental values (Dobrzyńska et al. 2004, Marceysiak, 2005).

---

<sup>1</sup> Council Regulation (EC) No 1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund and Council Regulation (EC) No 445/2002 laying down detailed rules for the application of Council Regulation (EC) No 1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund. The above legal acts specify the main aims of programmes, conditions for their application and rules for calculating payments; they also indicate potential participants of the programmes.

<sup>2</sup> A priority zone is the area designed for implementing an agri-environmental programme which presents specific environmental problems and requires undertaking remediation or protecting activities. In Poland, 69 priority zones have been established, covering in total 32% of agricultural lands (770,800 ha).

The aim of the article is to identify factors determining the process of implementing the agri-environmental programme 2004-2006<sup>3</sup> in Poland in the context of changes introduced to this programme for the period of 2007-2013. Tasks of the research concerned the recognition of the main reason for farmers to join the agri-environmental programme; the determination of agricultural lands on which the agri-environmental programme was implemented by provinces, and the recognition of farmers' activities with a negative effect on the environment.

The research material included the data originating from the Agency for Restructuring and Modernisation of Agriculture, data of the Central Statistical Office, data of the Main Inspectorate of Agricultural and Food Quality, and the survey conducted in 2007, involving 85 advisers representing agricultural advisory centres, non-governmental organizations and institutions, as well as business entities engaged in agricultural counselling. The research applied the method of a diagnostic survey. A research hypothesis assumes that implementation of individual programme packages is highly dependent on financial advantages obtained by the farmer in consideration for the programme application, and it does not correspond to the level of knowledge concerning the protection of environment.

### **Research results and discussion**

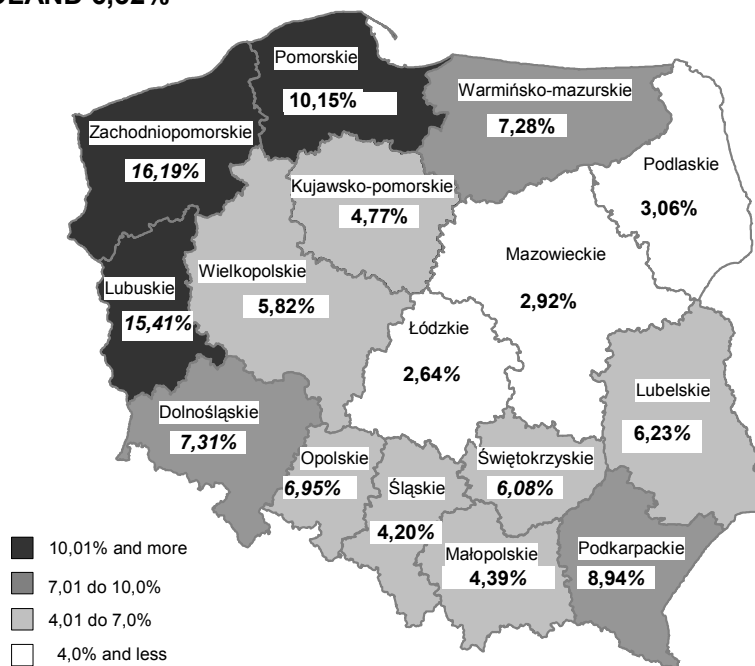
The idea of creating agri-environmental programmes is to specify precisely the problems which are to be solved within the framework of the national programme, determining key habitats and designing areas where the concentration of activities is advisable in order to multiply environmental effects (Gruda, 2006). The experiences from implementing the agri-environmental programme for 2004-2007 in Poland showed that limited possibilities of implementing certain packages (sustainable farming, maintenance of extensive meadows and pastures) in priority zones only did not bring about the expected environmental effects. Consequently, in the new agri-environmental programme for 2007-2013, all packages will be accessible in the whole area of Poland.

An agri-environmental programme should be prepared in such a way so as the development of agriculture could be possible without the loss of existing environmental values. Farmers, beneficiaries of the programme, should obtain subsidies in the amount that would account for their income foregone (as a result of economy transit towards extensive methods of agricultural production) and additionally for incurred costs, which do not result from the standard agricultural activities. While estimating the amount of payment, it is very important not to overpay and at the same time to provide the farmer with the sense of proper compensation. Moreover, the impact of an agri-environmental programme grows with the size of the area it covers. The Polish experience shows that it has not been fully achieved. While comparing the area of programme implementation to the area covered by agricultural lands in the province, it can be revealed that the highest percentage of agricultural lands upon which the programme was carried out is located in the strip covering the north-western provinces (the West Pomerania Province – 16.19%, the Lubuskie Province – 15.41% and the Pomerania Province – 10.15%). As follows from the analysis carried out by Krasowicz (2006), those provinces are implementing the model of extensive organization of production, with relatively high management intensity. At the same time, in three provinces: Łódzkie, Mazowieckie and Podlaskie, the percentage of area covered by the agri-environmental programme in 2006 was the lowest (two times smaller than the average rate for Poland) (Figure 1).

On the other hand, the same provinces carried out the model of intensive organisation of production, particularly animal farming, at a generally lower level of expenditure (extensive management). There is a lot to suggest that farms in this area do not have satisfactory means at their disposal to finance investments, which are necessary to participate in the agri-environmental programme (Krasowicz 2006).

---

<sup>3</sup> The agri-environmental programme covered by the Rural Development Plan for 2004-2006 was implemented also in 2007, whereas farmers not only submitted the continuation applications, but also extended their previous commitments by new packages.

**POLAND 6,32%**

Source: Own study based on ARMA data

**Figure. 1. The area on which the agri-environmental programme was implemented, as % of agricultural lands, by provinces**

The package of soil and water protection was the most popular among the farmers in the agri-environmental programme for the years of 2004-2006. 51,496 applications were submitted for its implementation, and the package covered over 60% of the whole acreage of the agri-environmental programme. The implementation of this package consisted in maintaining vegetation on arable land (undersown catch crop, winter catch crop, stubble catch crop) in periods between two main crop yields (field works can be undertaken only after March 1). Payments for these activities offset the costs, while the annual quality improvement of the soil culture is about 3% (PROW, 2007).

The second package, as regards implementation, was organic farming – 3 075 applications concerning the area of about 23% of agricultural lands. The possibility to obtain financial support for practising farming with the use of ecological methods became an incentive to run the production with ecological methods. A constant, regular growth of organic farms and the acreage they cover takes place in Poland (in 2006 it was almost three times as large as the area of an average farm in Poland). In 2001, there were 1,778 certified organic farms in Poland, while in subsequent years the growth rate was 11.2%, 15.6% and 64.5%. The highest growth in the number of farms was observed in the period when the organic farming package was implemented, and in 2004-2005 this number grew by even 91%. However, taking into consideration the lack of proper promotion, the development of processing industry and efficient channels for distributing organic products, further development possibilities for this type of farms seem to be limited. This is confirmed by the example of Austria and Finland (countries of very high percentage of organic farms), where subsidies for organic farming areas stimulated the transformation of farms, without ensuring the possibilities for maintaining this process in the longer period of time (Korelska, 2006).

Payments for the application of individual organic farming packages differed depending on the crop and the fact whether the farm was in the period of transition to organic production (higher payment), or had already obtained a certificate of an organic farm. The highest payment concerned fruit culture in the period of transition to organic production (1,800 PLN/ha), while the lowest payment was related to permanent grassland (260-330 PLN/ha). Such high payments for running organic fruit farming resulted in the popularity of particularly these types of fruit farming crops, which did not require high financial expenditures, such as

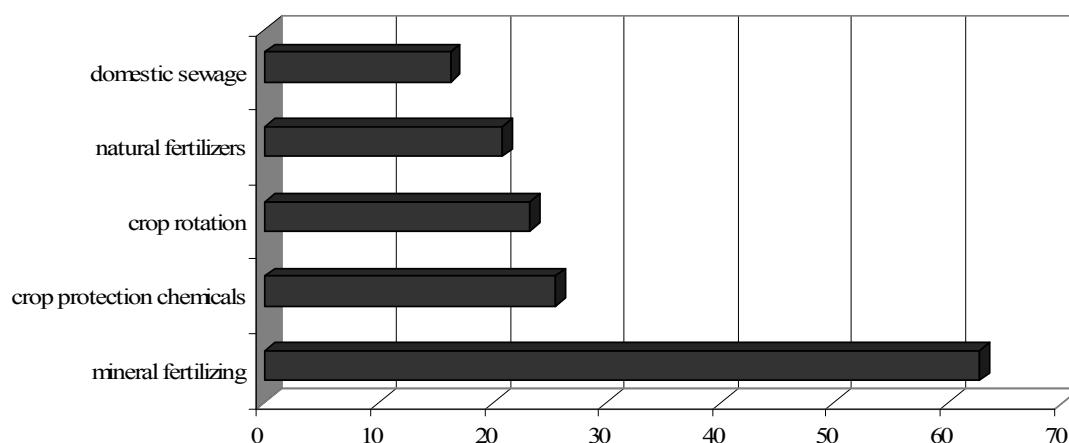
organic cultivation of walnut. This is also one of the reasons for distinguishing in a new agri-environmental programme for 2007-2013 the so-called other fruit farming, with payments by over 50% lower (650-800 PLN/ha). In the opinion of 95% advisers surveyed, the main motive for farmers to join the agri-environmental programmes was related to financial benefits they provided. Moreover, due to high rates of payments for some packages, beneficiaries of the programme included persons who had not conducted any agricultural production before and started it with the beginning of their participation in the programme under discussion. As a result of the foregoing, payments in their case were not as much an offset for the income foregone, but a key item in their revenue, which with low costs brings about into a quite high profit.

In 2004-2006, packages aiming at the extensification of meadows and pastures could be implemented only in priority zones. The changes in this regard concern the possibility of undertaking agri-environmental activities on permanent grasslands in the area of the whole country. The "environmental" package will be performed without any material changes in two options: in the nature 2000 areas and outside these areas. However, it will be necessary to prepare a complete environmental documentation concerning the habitat. As its supplement, a package of "extensive permanent grassland" has been prepared (subsidy about 500 pln/ha<sup>-1</sup>), with far less stringent requirements than in case of the environmental package. Practically each extensive meadow or pasture on which the environmental package has not been implemented can be covered with this package.

In 2004-2006, the interest in implementing sustainable farming and buffer zone packages was relatively low among farmers. In total, there were submitted 2,085 applications in Poland for the implementation of the sustainable farming package, and for instance in Warmia and Mazury Province, this package was implemented only on 3.2% of agricultural lands located in the priority zones. Its low popularity among farmers was caused not as much by limiting the possibility of its implementation to the priority zones, as by a low rate of subsidies – 160 PLN/ha. In the new agri-environmental programme, the payments grow to 360 PLN/ha, with lower than before restrictions concerning the cultivation of land (restrictions concern only limiting nitrogen fertilization to 150 kg/ha on arable land and 120 kg/ha on grassland, without the need to develop fertilization plans or prepare nitrogen balances). The management based on the soil analysis and the fertilization plan favours the rational usage of natural resources and constitutes a basis for environmental planning in proper farming (Kuś J., Krasowicz S., 2001).

In the opinion of the majority of advisers surveyed, the level of ecological awareness of farmers is low (47.1%) and very low (10.6%). On the traditional five-grade scale, 40% advisers are of the opinion that ecological awareness of farmers is on an average level. 52.4% advisers claim that the negative impact of agricultural practices on the environment is revealed first of all in an unreasonable application of mineral fertilization (62.8%). The advisers indicate elevated doses of mineral fertilizing in farms intensifying the agricultural production. They emphasise the fact that these farms will rather not participate in the implementation of the agri-environmental programme since the intensive production will provide them with higher economic advantages than the income from the implementation of agri-environmental undertakings. Other objections concern the failure to obey applicable rules for handling chemicals (25.5%). This concerns not only the application of optimal doses of crop protection chemicals (intensive farms), but also improper storage of containers with these chemicals. Improper crop rotation (mainly the application of cereal monocultures) is another reason for the degradation of natural environment, caused by poor agricultural practice. In the opinion of the advisers, natural fertilizers in many agricultural farms are disposed, stored, and applied in an improper way and domestic sewage is disposed on arable lands (Figure 2).

Inspections of agri-environmental commitments carried out so far included first of all the measurement of agricultural plots, the adherence to usual good farming practice principles (to a very limited extent), as well as involved checking the required documentation. As follows from the data of the Agency for Restructuring and Modernisation of Agriculture, irregularities were found in about 84.3% of the agricultural farms controlled, and significant irregularities were found in about 3.8% of them, resulting in the suspension of the agri-environmental payment.



Source: Own studies

**Figure. 2. Areas of farmers' activities with a negative effect on the environment in the adviser's opinion**

The most frequent irregularities concerned the differences between the areas declared and actually established differences between declared and actual cultivation, and the change of arable land structure (reduction of permanent grassland). Irregularities related to good farming practice are in fact very difficult to control; consequently, the effect of agri-environmental programme depends to a very high degree on the ecological awareness of its beneficiaries. Recognizing the fact of low ecological awareness of farmers, there appears the need to look for ways to improve the situation under discussion. In the opinion of 56.5% advisers surveyed, necessary undertakings include comprehensive information and training activities, implementation of special educational programmes for rural population (opinions of 23.5% respondents), as well as support for professional counselling as regards environmental and landscape protection (10.6%).

### Conclusions and recommendations

The experience gathered during the implementation of the agri-environmental programme for 2004-2006 in Poland shows that the inclination of farmers to implement agri-environmental packages is to a large extent determined by the amount of financial support and the requirements within variants of individual agri-environmental packages. The main reason for farmers to join the agri-environmental programme was financial benefit associated with the possibility of improving the profitability of farms run by them. The motives for beneficiaries' activities do not discredit the agri-environmental programme itself. It is rather the improper acceptance of criteria concerning the access to financially attractive agri-environmental packages. In many agri-environmental packages for the years 2007-2013, access criteria became more stringent. Additionally, area restrictions concerning certain crops were introduced and the amount of payment was verified, so as it could correspond to a larger extent to the costs really incurred, and at the same time encourage the implementation of those packages of the agri-environmental programme, which the farmers implemented quite unwillingly (sustainable agriculture, buffer zones).

Increasing the possibilities in which the programme can affect natural environment depends not only on the increase of means for individual undertakings, but on the growth of the level of farmers' ecological awareness, as well as the existence of an efficient system of monitoring both positive and negative impact of farming on the environment. Additionally, the development of organic agriculture cannot be supported only by payments for the area covered by organic crops. What is also necessary is its proper promotion, development of processing industry and improving distribution channels for organic products.

### References

1. Dobrzyńska N., M. Joboda, A. Klisowska, A. Liro, M. Szemplińska., 2004. Przewodnik po krajowym programie rolnośrodowiskowym. MRiOW: ss. 28. Warszawa
2. Gruda m., 2006. Analiza skutków dochodowych wdrażania ograniczeń rolnośrodowiskowych w rolnictwie (konceptja). W: z badań nad rolnictwem społecznie zrównoważonym (2): s. 43-56. Warszawa, ierigż.
3. Korelska E., 2006. Rolnictwo ekologiczne w Polsce i innych krajach Unii Europejskiej, Zesz. Nauk. AR Rolnictwo LXXXVII (540): s. 241-246. Wrocław
4. Krasowicz S., 2006. Możliwości dostosowania produkcji roślinnej w różnych regionach Polski do wymogów Unii Europejskiej, Roczniki Naukowe SERiA t.VIII, z.4, s. 187-192
5. Kuś J., Krasowicz S., 2001. Przyrodniczo – organizacyjne uwarunkowania zrównoważonego rozwoju gospodarstw rolnych. Pam. Puł., z. 124: s. 273-288
6. Marcysiak T., 2005. Realizacja programów rolnośrodowiskowych w woj. kujawsko-pomorskim. Prace Komisji Nauk Rolniczych i Biologicznych nr XLIV: s. 353-360 Bydgoszcz, Bydgoskie Towarzystwo Naukowe
7. Plan Rozwoju Wsi i Rolnictwa na lata 2004-2006. 2004, MRiRW, Warszawa
8. Program Rozwoju Obszarów Wiejskich na lata 2007-2013. 2007, MRiRW, Warszawa



## Assessment of Agricultural Development in the Region of Latgale

Dr.oec., professor **Veronika Bušina**

Department of Economics, Faculty of Economics, Latvia University of Agriculture

Mg.oec. **Kristīne Muktupāvela**

Rural Support Service senior officer, EU Direct Payments Department

### Abstract

There are more than 3840 rural populated places in Latgale, where approximately 42% of rural residents live. During 2003-2005, the number of farms has increased from 45149 to 45880; their farmed areas have increased from 704.1 thousand ha to 790.4 thousand ha, of which agricultural land areas accounted for 65% and 63%.

The main agricultural industries are cereal growing, dairy and meat cattle farming. Potatoes, vegetables and industrial crops are also cultivated.

According to the analysis of net value added (wages, rental and interest rate payments and expected profits) per labour unit in the region of Latgale, one can see that in the period from 2002 to 2004 it has increased from LVL 693 to LVL 2625, whereas in 2005 it has decreased and amounted to LVL 2487.

In order to achieve the aim of the study, a survey of farmers was conducted (197 questionnaires). The goal of the survey was to ascertain the existent situation in agriculture in Latgale and the views of farmers regarding the situation. 183 respondents believe that the EU support is significant for Latvian agriculture.

**Key words:** agriculture, crop farming, livestock farming, Latgale region.

### Introduction

Agriculture is one of the industries using land mostly. Agriculture consists of two sub-industries: crop farming and livestock farming. 42% of all residents in Latgale region live in rural areas; they work as paid employees, and are engaged in agricultural production for the purpose of either subsistence or sales in the market.

Many scientists have researched identification, definitions, classification, performance and other aspects of agricultural industries, and the achievements of these researches have been published in scientific proceedings and textbooks (Saimniekošanas mācība, 1999; Augkopība, 2004). The publications of scientists, experts and practitioners usually contain interesting data, conclusions or interpretations on issues regarding the use of agricultural production resources, their impact on costs, prices and labour productivity. There are interesting studies on financing agriculture (Rural Development Programme 2007-2013), and the risks impacting agricultural production (project "Possibilities and Solutions for Developing an Agricultural Insurance System in Latvia", 2007). Prospects for agriculture in the European Union have been determined (Equilibrium Development of the Agricultural Products Market in the EU, 2007). However, the processes of economic activity are very dynamic and volatile. Therefore, regular studies have to be conducted on assessments of agricultural production development. These assessments and considerations have set the aim of the study.

The **aim of the paper** is to assess the development of agriculture, and to ascertain the possibilities for agricultural growth in the region of Latgale.

The **tasks of the study**:

- 1) to ascertain the situation in the agricultural industry in the region of Latgale;
- 2) to determine the possibilities for agricultural development.

The research **methods** used in the study: monographic, graphical, statistical and surveying.

The **materials** used in the study: data bases of the Rural Support Service, data of the Central Statistical Bureau, data of Latvian State Institute of Agrarian Economics, special literature and the Internet.

## Results and Discussion

### Agriculture in Latgale

There are more than 3840 inhabited places in Latgale where approximately 42% of rural residents live. A great number of small villages (consisting of few farmsteads) is a specific feature of the region; the density of population is 10 residents per 1 km<sup>2</sup>. As very few enterprises are located in rural areas, rural residents establish farms or just simply produce crops and livestock in order to make their living (Latgale Planning Region Territorial Plan 2006).

As we can see in Table 1, the number of farms has grown by 731 during the period of 2003-2005. One of the reasons explaining this increase is the fact that funding for new farmers is available after joining the European Union as well as additional financial support for farmers engaged in agricultural production is offered.

Table 1  
Number of farms and land areas in 2003 and 2005 in Latgale region

Year	Number of farms	Total land area thousand ha	Total agricultural land area, thousand ha	Unused agricultural land area, thousand ha
2003	45149	704.1	454.9	74.2
2005	45880	790.4	500.3	61.3

Source: authors' estimates according to 2005 Farm Survey data, 2006

The area of agricultural land has substantially increased – by 45.4 thousand ha. The area of unused agricultural land has decreased by 12.9 thousand ha. However 61.3 thousand ha of land are not used, which is a great number.

Table 2 shows that the average size of farms, in terms of land area, has increased in Latgale year by year. The increase is related to the fact that farms are interested in development, therefore, they enlarge their size to earn more income from agricultural production. It is possible that large farms plan future development by increasing their size, therefore the average indicators rise, too.

Table 2  
Average farm sizes in 2001, 2003 and 2005 in Latgale region

Year	On average per farm, ha	
	Total land area	Agricultural land area
2001	14.7	9.5
2003	16.1	10.3
2005	17.9	11.2

Source: authors' estimates according to 2005 Farm Survey data, 2006

The land can be broken down into 2 categories: land for agricultural use and non-agricultural use. Agricultural land includes: arable land (fields), meadows, pastures, orchards and fallows.

Table 3 shows that Latgale region has the largest total agricultural land area and the largest used agricultural land area of 449.5 thousand ha. 47.2% of this area is used as meadows and pastures, providing dairy and meat farms with forage, and as arable lands, for instance, for cereal growing.

Table 3  
Use of agricultural land in Latvian regions in 2005, thousand ha

	Total agricultural land	of which agricultural land in use						
		total	Including					
			arable land	%	perennials	%	grasslands and pastures	%
Pierīga	260.9	223.2	147.3	66.0	4.1	2.8	71.8	32.1
Vidzeme	402.8	336.8	176.2	52.3	4.2	2.4	156.4	45.3
Kurzeme	359.4	324.8	244.7	75.3	4.4	1.8	75.6	22.9
Zemgale	401.9	371.0	282.0	76.0	6.7	2.4	82.3	21.6
<b>Latgale</b>	<b>500.3</b>	<b>449.5</b>	<b>227.4</b>	<b>50.6</b>	<b>4.9</b>	<b>2.2</b>	<b>217.2</b>	<b>47.2</b>
<b>Total:</b>	<b>1925.3</b>	<b>1705.3</b>	<b>1077.6</b>	<b>63.2</b>	<b>24.3</b>	<b>1.4</b>	<b>603.3</b>	<b>35.4</b>

Source: authors' estimates according to 2005 Farm Survey data, 2006

For this reason, the key agricultural industries in the region are: cereal farming, dairy and meat farming. Potatoes, vegetables and industrial crops are also grown.

Table 4

**Sown areas and crop yields in Latgale region during 2001-2005**

	Sown area, ha			Yield, cnt/ha		
	cereals	potatoes	vegetables (open field)	cereals	potatoes	vegetables (open field)
<b>2001</b>	72 917	14 539	3 073	17.10	96.90	98.00
<b>2002</b>	67 814	14 536	2 214	18.10	120.50	91.10
<b>2003</b>	73 314	15 494	2 846	11.90	106.00	109.60
<b>2004</b>	68 044	13 664	3 091	19.10	112.30	114.50
<b>2005</b>	75 567	11 792	2 550	19.70	104.90	93.80

Source: authors' estimates according to the Statistical Yearbook of Latvia data, 2006

The data of Table 4 show that the largest area sown with cereals was observed in 2005, reaching 75.5 thousand ha, i.e., by 7.5 thousand ha more than in 2004. The average cereal yield rose to 19.7 cnt/ha although unfavourable weather conditions existed in the spring of 2005 in Latgale region, which could impact the yield. The area planted with potatoes has declined since 2003; the potato and vegetable yields have fluctuated from year to year.

If analysing the data on areas sown with cereals in detail (Table 5), one can observe that in 2005 compared to 2004 the areas sown with winter rye, triticale and spring barley decreased by 4.3 thousand ha. The hectareage of other crop areas increased in 2005 mostly that of spring wheat and oat – in total by 6.1 thousand ha. In the industry of livestock farming (according to Table 6), milk was mostly produced and its output was 198.6 thousand tons in 2005.

Table 5

**Cereal sown areas in Latgale region in 2004 and 2005, thousand ha**

Cereals	2004	2005	change 2005/2004, +/-
Winter rye	8.9	7.6	-1.3
Winter wheat	8.9	8.9	0
Winter barley	0.6	1.1	0.5
Triticale	5.1	3.1	-2.0
Spring wheat	4.3	7.5	3.2
Spring barley	23.8	22.8	-1.0
Outs	16.1	19.0	2.9
Buckwheat	0.6	1.0	0.4

Source: authors' estimates according to the Statistical Yearbook of Latvia data, 2006

This indicator has decreased by 1.4 thousand tons if compared to 2003. The JSC *Preiļu siers*, located in the town of Preiļi and *Daugavpils saldējuma fabrika* Ltd are the largest dairy processing plants, farmers can deliver their produce to.

Table 6

**Output of livestock products during 2001-2005 in Latgale region**

Year	Meat (carcass weight) – total, t	Milk – total, t	Eggs – total, mln.pcs
2001	10 975	222 784	53
2002	11 053	205 435	55
2003	12 793	200 005	57
2004	11 784	197 711	59
2005	11 347	198 607	58

Source: authors' estimates according to the Statistical Yearbook of Latvia data, 2006

The output of meat grew in Latgale region till 2003 (Table 6), then has fallen since 2004. In 2003, 12.8 thousand tons of meat were produced (in carcass weight), but in 2005 only 11.3 thousand tons, the decrease was 1.5 thousand tons. These data may lead to the conclusion that the dairy industry has a better outlook among other livestock industries.

With the accession of Latvia to the European Union, Latvian farmers, in addition to income from agricultural product sales, receive financial support not only from the national government, but also from the European Union.

In 2004 Latvian farmers could apply for 3 types of support: single area payments, additional direct government payments and support for less favourable areas. Latgalian farmers received in total LVL 18.6 million from the European Union. Each year the number of types of support increase, and in 2006 farmers could apply for 6 types of support. As the support payments of the year 2006 continued till 30 June, 2007, so far Latgalian farmers had received LVL 31.7 million in payments (Table 7); it is by LVL 12 million more than in 2004. One can conclude that both the European financial support and the number of farmers applying for support payments increases, as the area which had received support payments has increased.

Farm incomes consist of the value of agricultural produce as well as the EU and national support payments. Personal consumption, farm internal consumption providing the process of production, and variations in stock are included in the value of produce along with the sales income.

Table 7

**Paid sums by type of support in Latgale region during 2004-2006**

Type of support	2004 thousand LVL	2005		2006*	
		thousand LVL	2005/2004 %	thousand LVL	2006/2005 %
Single area payments	4 124.2	6 687.5	62	7 901.9	18
Additional direct government payments	3 292.2	4 287.9	30	5 660.7	32
Less favoured areas	10 831.1	13 974.5	29	14 235.5	2
Organic farming development	---	2 793.4		2 913.2	4
Preserving biodiversity in grasslands	---	388.5		533.7	37
Limited activity areas for environmental protection	---	508.3		521.6	3
<b>TOTAL:</b>	<b>18 557.2</b>	<b>29 010.8</b>		<b>31 766.5</b>	<b>10</b>

\* data as of 16 April, 2007

Source: table developed by the authors according to Rural Support Service data

**Farm income structure from the basic activity**

The main positions of support payments received from the EU and the national government in the accounting period are as follows:

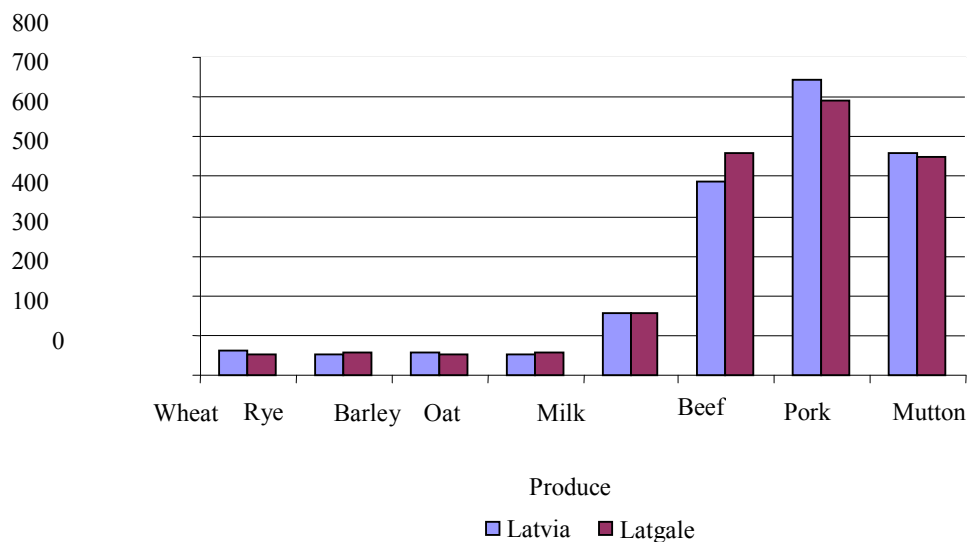
- EU single area payments;
- EU payments for activity in less favoured areas;
- direct payments related to agricultural production;
- support for organic farming;
- interest rate subsidies;
- cost reimbursement including the excise tax for diesel fuel consumed on farms;
- investment subsidies for developing agricultural production and advancing technologies (SUDAT, 2005).

Most of the farmers' income in Latgale region in 2005 was gained from the produce of livestock farming, accounting for 33% of the total income. The income from crop farming as well as the EU and national support payments were almost equal and accounted for 29% and 28% respectively (SUDAT, 2006). One can draw a conclusion that the financial support is substantial for farmers, on average accounting for almost a third of the total farm income.

Farm income depends not only on the output of agricultural produce and received subsidies, but also on the prices of products sold in the market.

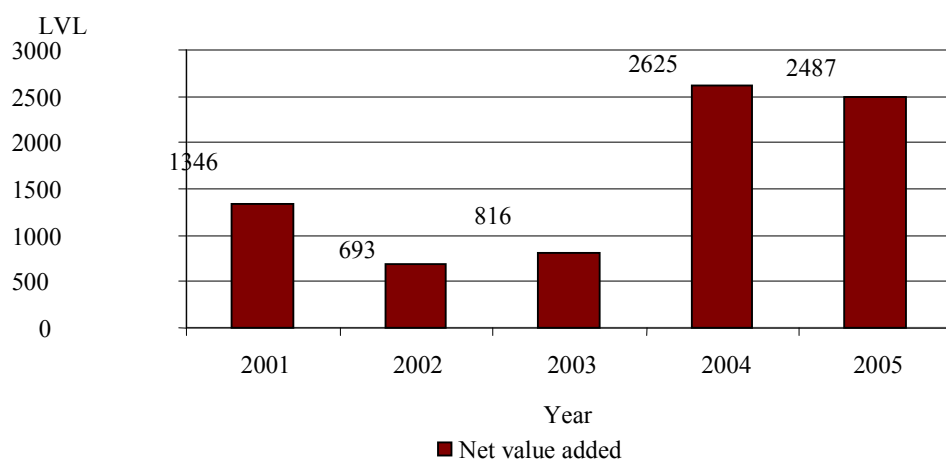
Figure 1 shows that higher average prices were observed in Latgale compared to the average prices in the country for rye, oat and beef. The largest price difference existed for beef; its average price in Latgale was 557 LVL/t, while in Latvia it was 488 LVL/t, i.e., by LVL 69 more expensive. Other product price differences were not so significant.

Net value added (hereinafter in the text NVA) is an important economic indicator characterising a newly created value in an enterprise using resources of production. NVA is a sum consisting of product sales and support payments subtracted by specific and overhead costs, depreciation of fixed assets and corporate taxes. NVA presents the available funds for paying wages, rent and interest rate, and expected profit (Latvijas lauku saimniecību darba ekonomiskās analīzes 2005, 2006).



Source: the results economic analysis of Latvian farms performance in 2005,2006  
Figure 1. **The average sales prices in Latvia and Latgale region in 2005, LVL/t**

If analysing the net value added per annual work unit<sup>4</sup> in the region of Latgale (Figure 2), one can see that after a strong increase in 2004, the indicator has slightly decreased. The strong increase in 2004 relates to an increase in subsidies that boosted the increase in NVA per annual work unit.



Source: the results of economic analysis of Latvian farms performance in 2005,2006  
Figure 2. **Farm net value added per labour unit in Latgale region during 2001-2005, LVL**

### **Agricultural Development Possibilities in the Region of Latgale**

Incomes by industries in Latgale have to be analysed in order to ascertain the most profitable industry, and to make forecasts on profitable businesses for farmers.

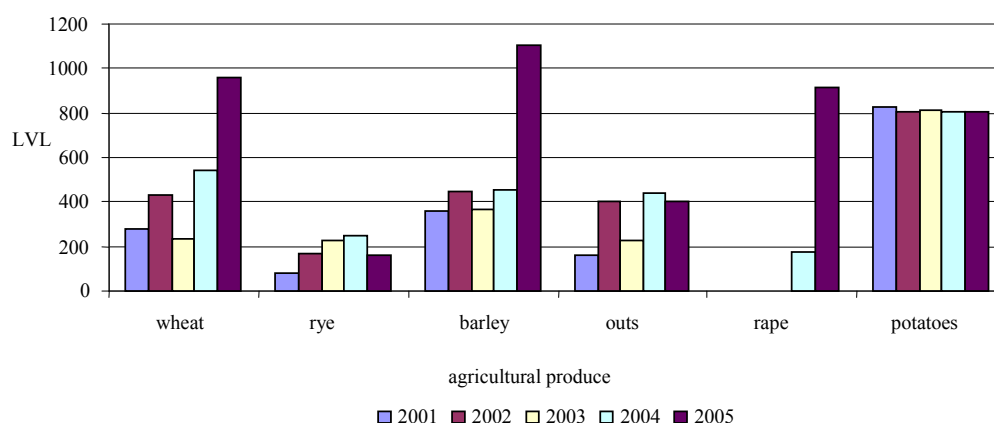
The data of SUDAT (FADN) books published by Latvian State Institute of Agrarian Economics are used for the analysis. These books compile farm performance results. The number of analysed farms

<sup>4</sup> an annual work unit is equal to 1840 working hours or 1 person-year

increases from year to year. Only 60 farms were studied in Latgale region in 2001, whereas in 2005 this number rose to 156.

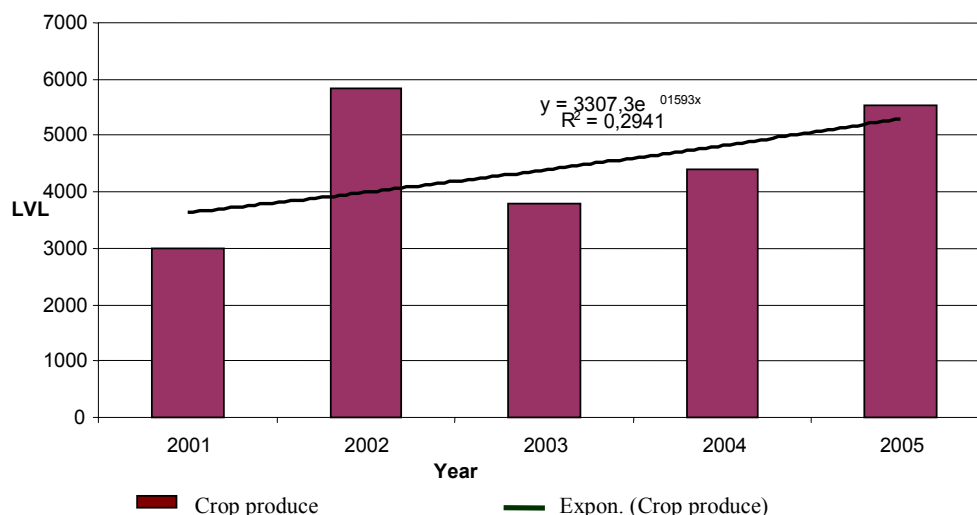
### Crop farming

Cereal farming is an important crop industry not only in Latvia, but in Latgale region, too. According to Figure 3, in 2005 the output of wheat, barley and rape increased disregarding the fact that the year 2005 was unfavourable for crop growing due to the weather conditions. The value of produced rape increased at the fastest rate. The value of rye and oat slightly decreased, while the value of produced potatoes has not changed over the years.



Source: the results of economic analysis of Latvian farms performance in 2001-2005; 2002-2006  
**Figure 3. Average output of crops in Latgale region during 2001-2005, LVL/6.1 economic size unit**

As crop farming is closely related to livestock farming, the value of produced crops could only increase in the future, and the cereal industry is going to develop. During 2005-2006 the total consumption of cereals amounted to 957.2 thousand tons, of which 12% were used as seed, 53% as feed, 9% for industrial processing and 27% for food. Over the next years in Latgale, the output of rape might sharply increase as a new type of support is introduced since 2007 targeting crops with a high energy value. It implies that if a farmer grows such a crop and sells it to processors which produce energy products, the farmer will receive an extra support payment of 45 EUR/ha along with the existing support payments. As there are several enterprises in Latgale region, for instance *Dadi invest Ltd*, the *JSC Barkavas arodi*, the *JSC Litenes klēts* and *Mammas D Ltd* which buy and process rape seeds, rape growing and the value of rape products could go up.



Source: the results of economic analysis of Latvian farms performance in 2001-2005; 2002-2006

Figure 4. **The average output of crop produce and its trend in Latgale region during 2001-2005, LVL/6.1 economic size unit**

The exponential regression curve was obtained when calculating the trend. Y is an indication showing the output of crop products in terms of money. The coefficient of regression  $b_0$  is equal to LVL 3307 showing the quantity of produced crop products in a point, where the exponential regression curve crosses the Y axis, e is a casual error.  $b_1$  is a coefficient of regression showing an increase rate for the average value of produced crops in Latgale region.

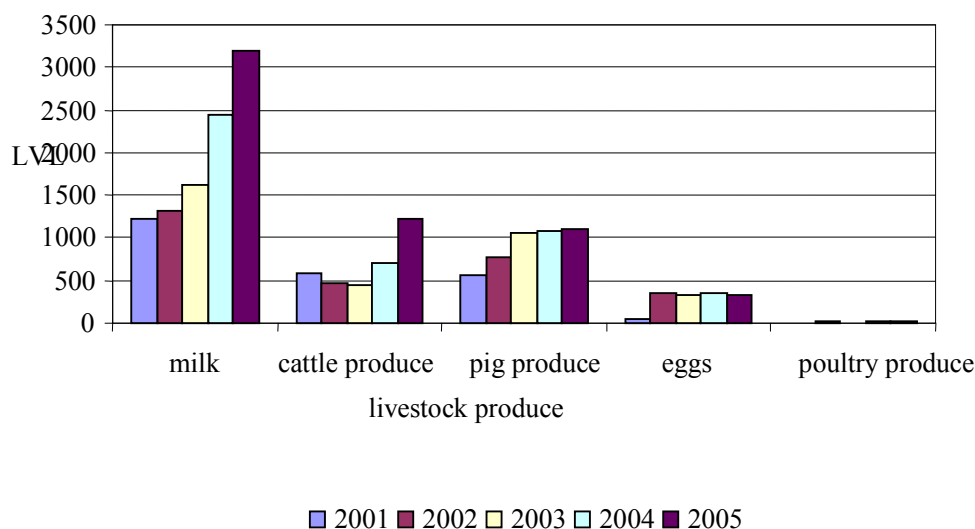
During 2001-2005, the real increase rate for the value of crop products in Latgale region was 15.93% (Figure 4). At the same time one has to stress that the coefficient of determination is low and the relationship is weak.

### **Livestock farming**

Dairy farming is the basic livestock industry in Latgale region. According to Figure 5, the value of products produced by dairy farming is the largest, and tends to increase from year to year. Dairy farming supplies calves to meat cattle producers. Since 2003, the value of cattle products has gradually increased. Both these industries are interconnected, although the meat cattle raising industry, supplying no milk, has become more popular over the recent years. This industry might become profitable in the future as high quality meat is a demanded product not only in Latvia, but also abroad.

The dairy industry has also prospects for development in Latgale region as one of the largest milk processing plants the JSC Preiļu siers is located in the region. This enterprise is the largest cheese exporter in the country, which buys milk almost from the whole region. The enterprise has stable income guaranteeing timely payments to milk producers.

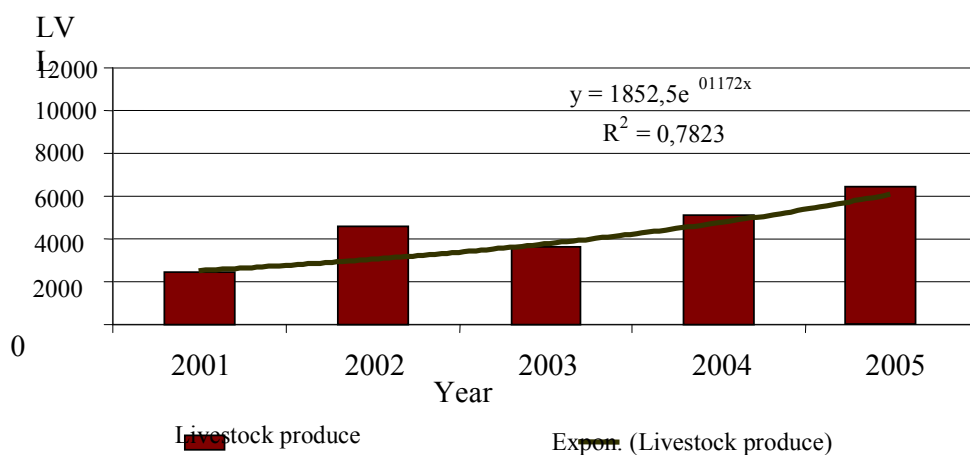




Source: the results of economic analysis of Latvian farms performance in 2001-2005; 2002-2006  
 Figure 5. **The average output of livestock produce in Latgale region during 2001-2005, LVL/6.1 economic size unit**

As products supplied by the JSC Preļu siera are popular not only in Latvia, but abroad as well, milk will be demanded in the future, too, urging farmers to develop dairy farming and earn more income.

Y is a positive indication showing the quantity of produced livestock products in terms of money (Latvian lats). The regression coefficient  $b_0$  shows that the quantity of produced livestock products is LVL 1852 in a point, where the exponential regression curve crosses the Y axis.  $b_1$  shows an increase rate for the value of produced livestock products in Latgale region.



Source: the results of economic analysis of Latvian farms performance in 2001-2005; 2002-2006  
 Figure 6. **The average output of livestock produce and its trend in Latgale region during 2001-2005, LVL/6.1 economic size unit**

The regression analysis showed that the real increase rate for the value of livestock products was 11.72% during 2001-2005 in Latgale region (Figure 6).

If compared to the increase rate in the crop industry, this indicator is by 4 percentage points less for the livestock industry. However, the livestock industry provides larger income than the crop industry to farms in Latgale region.

### Farmers' opinions on the development perspectives

To achieve the aim of the study more successfully, a survey of farmers was conducted, the goal of which was to ascertain the situation in agriculture in Latgale region, and to find out the opinion of farmers on this situation.

The questions were drawn up for the survey and 50 questionnaires were prepared for each district of Latgale: Daugavpils, Krāslava, Preiļi, Ludza, Balvi and Rēzekne; 300 questionnaires in total. To carry out the survey successfully, the authors cooperated with Rural Consultation Bureaus, Regional Agricultural Boards of the Rural Support Service of each district, as well as the authors surveyed farmers on the spot.

The authors received 218 completed questionnaires, 21 of which were filled in incompletely and could not be used in the study. So, 197 questionnaires could be used for compiling information and drawing conclusions.

It is important not only to investigate the current situation in agriculture, but to ascertain the opinion of farmers on whether agriculture is a prospective industry and whether respondents wish to develop their farms. It is believed that in Latgale region the main agricultural industries are cereal farming, dairy and meat farming.

Livestock industries, like dairy farming, meat cattle and sheep farming are the agricultural industries that are profitable in Latgale region. This is a view of 115 Latgale region farmers (Table 8).

The purchasing prices of milk have increased over the last years. The Latgalian enterprise JSC Preiļus exports 95% of its products, and sets an appropriate milk purchasing price of LVL 0.15-0.20 per litre, as well as pays farmers for milk supply on time. Thus the enterprise fosters the development of dairy farming.

Table 8

#### Prospects for the agricultural industry in Latgale region

Agricultural industry	Number of respondents
Meat cattle	45
Sheep farming	21
Dairy farming	49
Livestock farming	21
Crop farming	24
Fruit farming	7
Rural tourism	7
Flax farming	4
Other	12
No opinion	6

Source: questionnaire results

Sheep farming is one of the industries that could develop and be profitable in Latgale region; it is proved by the survey results. Currently there is a situation in Latvia that the demand for mutton in the local market is high and it is not imported as well due to the lack of mutton in foreign markets, too. There are all preconditions for raising sheep in Latgale. There are a lot of free agricultural lands for grazing sheep and preparing hay. There are hills and hillsides that cannot be used for crop farming, but they are appropriate for pastures, besides, sheep farming requires no large financial investments.

### CONCLUSIONS

1. The area of agricultural land in Latgale has substantially increased – by 45.4 thousand ha. The area of unused agricultural land has decreased by 12.9 thousand ha. The largest area sown with cereals in Latgale was in 2005, reaching 75.5 thousand ha, i.e., by 7.5 thousand ha more than in 2004.

2. In 2005 livestock farming in Latgale region provided the largest value of agricultural products, accounting for 53% of the total output. Milk was mostly produced and its output equalled to 198.6 thousand tons in 2005. The output of meat decreases in Latgale year by year. In 2003, 12.8 thousand tons of meat were produced (in carcass weight), but in 2005 only 11.3 thousand tons, the decrease was 1.5 thousand tons.
3. It was estimated by using the regression analysis that in Latgale region, the average increase rate in crop farming was 15.93% while it was 11.72% in livestock farming.
4. Rape growing would be a prospective crop industry in Latgale, as several biofuel plants are located there. The plants would mainly produce biodiesel fuel. Farmers can also receive support for this purpose if growing crops with a high energy value.
5. Dairy farming is a prospective industry in Latgale region as income from this produce are the largest and tend to increase year by year. One of the largest dairy processing plants, the JSC Preiļu siera, is located in the region. It exports 95% of its output.
6. Sheep farming is a prospective industry as Latgale region is appropriate for sheep raising. Besides, a situation emerged in Latvia shows that the local market demand for mutton increases its supply.

### References

1. Adamovičs, A., Bankina, B., Bērziņš, A. U.c. Augkopība. Jelgava: Latvijas Lauksaimniecības universitāte, 2004. 374 lpp.
2. Arhipova, I., Bāliņa, S. Statistika ekonomikā un biznesā. Rīga: Datorzinību centrs, 2006. 362 lpp.;
3. 2005. gada lauku saimniecību struktūras apsekojums. Rīga: LR Centrālā statistikas pārvalde, 2006. 94 lpp.;
4. Dobeļe, A., Mihejeva, L., Špoģis, K. u.c. Saimniekošanas mācība. Ozolnieki: Latvijas Lauksaimniecības konsultācijas un izglītības atbalsta centrs, 1999. 344 lpp.
5. Latvijas lauku attīstības programma 2007. – 2013. gads [tiešsaiste] [skatīts 07.02.2008] Pieejams: [www.zm.gov.lv/doc-upe/latvijas\\_lauku\\_attistibas\\_programma\\_final.pdf](http://www.zm.gov.lv/doc-upe/latvijas_lauku_attistibas_programma_final.pdf)
6. Latvijas lauku saimniecību darba ekonomiskās analīzes rezultāti 2001. Rīga: Latvijas Valsts Agrārās ekonomikas institūts, 2002. 280 lpp.;
7. Latvijas lauku saimniecību darba ekonomiskās analīzes rezultāti 2002. Rīga: Latvijas Valsts Agrārās ekonomikas institūts, 2003. 265 lpp.;
8. Latvijas lauku saimniecību darba ekonomiskās analīzes rezultāti 2003. Rīga: Latvijas Valsts Agrārās ekonomikas institūts, 2004. 192 lpp.;
9. Latvijas lauku saimniecību darba ekonomiskās analīzes rezultāti 2004. Rīga: Latvijas Valsts Agrārās ekonomikas institūts, 2005. 207 lpp.;
10. Latvijas lauku saimniecību darba ekonomiskās analīzes rezultāti 2005. Rīga: Latvijas Valsts Agrārās ekonomikas institūts, 2006. 201 lpp.;
11. Lauksaimniecības produkcijas tirgus līdzsvara attīstība ES. Agropols.Nr. 5, 2007, marts 19.lpp.
12. Latvijas statistikas gadagrāmata, 2006. Rīga: LR Centrālā statistikas pārvalde, 2006. 280 lpp.;
13. Lauku atbalsta dienesta nepublicētā informācija;
14. Lauku atbalsta dienests. [tiešsaiste] [skatīts 21.maijā 2007.gadā.] Pieejams: [www.lad.gov.lv](http://www.lad.gov.lv);
15. Projekta Iespējas un risinājumi lauksaimniecības apdrošināšanas sistēmas attīstībai Latvijā. 1.posms „Pasaules valstu pieredzes izpēte lauksaimniecības risku apdrošināšanas jomā” [tiešsaiste] [skatīts 29.03.2007] Vieta: Latvijas Valsts agrārās ekonomikas institūts 2005.

## Use of *Checklists Method* for an Assessment of the Stages of Organizational Development

Marta Domagalska-Grędyś, PhD

Department of Agribusiness, Faculty of Agriculture and Economics Agricultural University of Krakow,  
Poland; rrdomaga@cyf-kr.edu.pl

### Abstract

At a given moment each enterprise is at some definite stage of development, which faces a characteristic kind of problems and uses specific method of management. The aim of the paper is to use the above mentioned method for diagnosing the developmental stages of an agribusiness enterprise by means of qualitative and quantitative measures (intensity and dispersion=diversification). The study will have practical application for economic entities, since it is aid to determine the stage of the entity development and indicate the proper operational strategies. The checklists method is a useful tool for organisational management. The analysed cooperative uses it to determine its real state and development strategy.

**Key words:** diagnosing the developmental stages of an agribusiness enterprise, stage of development, organization life cycle

### Introduction

Changeability is one of the most typical features characterising the operation of contemporary organizations (enterprises). Perceiving changes in the firm's environment and inside it is the crucial element of market strategy determining the success of market entities. The situation of contemporary enterprises is not stable. Numerous businesses are established and developing, but at the same time many go bankrupt<sup>5</sup>. Few firms are capable of simultaneous maintenance of dynamic development and high efficiency, as has been testified by a considerable rotation among the fifty best enterprises on the ranking "List of 2000 best Polish enterprises", which has been established since 2005.

**The changes in the environment** often happen irrespective of anybody's will, which however does not suggest helplessness of managers. They can and even must predict changes [...] that would provide the basis for the enterprise activity. Proper understanding of the processes of changes makes possible not only perception of the approaching problems and finding remedial measures, but also and the most importantly, choosing the proper method of management (Antoszkiewicz J.D., 2006).

At a given moment each enterprise is at some definite **stage of development**, which faces a characteristic kind of problems, and uses specific methods of management, etc. (Szpilt A., Fudaliński J. 2002). Proper adjustment of the enterprise to its environment and introduction of changes that would make its further development possible depends on proper identification of the development stage the company is at a given moment.

In market economy long-term effectiveness and efficiency of the enterprise depend on its ability to take advantage of the opportunity and avoid risks. The development approach in management, constituting the basis of the "organization life cycle" assumes that organizations aim at predictable decline, but struggle for survival seeking the ways to counteract the stagnation and decline.

The most common models of "**organization life cycle**" describe the development as linear, according to the ordered stages. In practice the development is not systematized. In such situation it is necessary to diagnose which stage of the development a company has reached (at present), which would make possible to undertake activities in case of a crisis.

A company diagnosing method used in practice is the one suggested by C. Pümpin and J. Prange [1999] using "checklists". The aim of the paper is to use the above mentioned method for diagnosing the development stages of an agribusiness enterprise by means of qualitative and quantitative measures (intensity

---

<sup>5</sup> Many enterprises, especially small ones close their operation even without carrying out bankruptcy procedure in the court. In the first half of 2007 in Poland the highest number of bankruptcies - 35 were registered in wholesale trade, construction companies with 26 declared bankruptcies placed second and enterprises manufacturing foodstuffs and beverages placed third.[eGospodarka <http://www.egospodarka.pl/2381>, Upadłości-firm-w-Polsce-I-VI-2007,3,39,1.html]

and dispersion=diversification). The study will have practical application for economic entities, since it is aid to determine the stage of the entity development and indicate the proper operational strategies.

### Method and region of studies

The “*checklists method*” contains criteria characteristic for the four fundamental stages of enterprise development: start-up (entrepreneurship), growth, maturity, and decline. The above mentioned method involves obtaining a number of answers to the questions describing the stage of an enterprise development<sup>6</sup> which have been grouped into four sets-checklists. Each list refers to a different stage of enterprise development comprising 14 synthetic and 56 analytical criteria changing at each stage. These included among others profit generators, the aim of the entity’s operation, turnover level, strategy, product, attitude to innovation and promotion, the decision making method, assessment of the management, capital, and organizational structure.

The first question in the questionnaire allowed establishing the external and internal profit generators in the analysed enterprise. Each of the other fourteen synthetic criteria contained four analytic criteria (a, b, c, d) including the answers:

- “a” – characterized the start-up (entrepreneurship) stage;
- “b” – characterized the growth stage;
- “c” – characterized the maturity stage;
- “d” – characterized the decline stage.

**At the first stage** of the study the respondents determined the degree to which the individual statements applied to the analysed enterprise and each respondent could assess them on a five degree scale as: DD- fully applicable, D – partially applicable, D/N – difficult to say, N – non applicable, NN- totally non applicable.

**The subsequent stage of the study** was **qualitative and quantitative analysis** of the answers obtained for individual stages. The qualitative method used a graphic method to analyse the elicited answers.

In the quantitative method the values of two measures for an assessment of obtained answers were computed separately for each stage.

- The first quantitative measure marked  $SN_i$  described the degree of intensity of answers for the  $i$ -th stage (so called mean value of the degree of answers intensity).

$i$  – analysed stage index ( $i = 1, \dots, 4$ );

$j$  – criterion index ( $j = 1, \dots, 14$ );

$l$  – intensity degree ( $l = 1, \dots, 5$ )

- The second quantitative method marked  $STD_i$  described the degree of dispersion of answers to individual questions for the  $i$ -th stage (standard deviation)

➤

**$SN_i$  – quantitative measure of intensity of answers for the  $i$ -th stage**

**$STD_i$  – quantitative of dispersion of answers to individual questions for the  $i$ -th stage**

$$SN_i = \frac{1}{14} \sum_{l=1}^5 l * K_{li}$$

$$STD_i = \sqrt{\frac{1}{14} \sum_{l=1}^5 K_{li} * (SN_i - l)^2}$$

$i$  – analysed stage index ( $i = 1, \dots, 4$ );

$j$  – criterion index ( $j = 1, \dots, 14$ );

$l$  – intensity degree ( $l = 1, \dots, 5$ )

$K_{li}$  – number of answers with  $l$  degree of intensity for the  $i$ -th stage

<sup>6</sup> In the presented research, an organisation is a synonym of an enterprise, firm or cooperative

If  $STD_i$  value is zero for the  $i$ -th stage it means that the answers to all the criteria on this list are the same. **The higher is the value it assumes, the greater is the dispersion of answers**, i.e., the stronger the uncertainty that the selected criteria apply to the analysed enterprise.

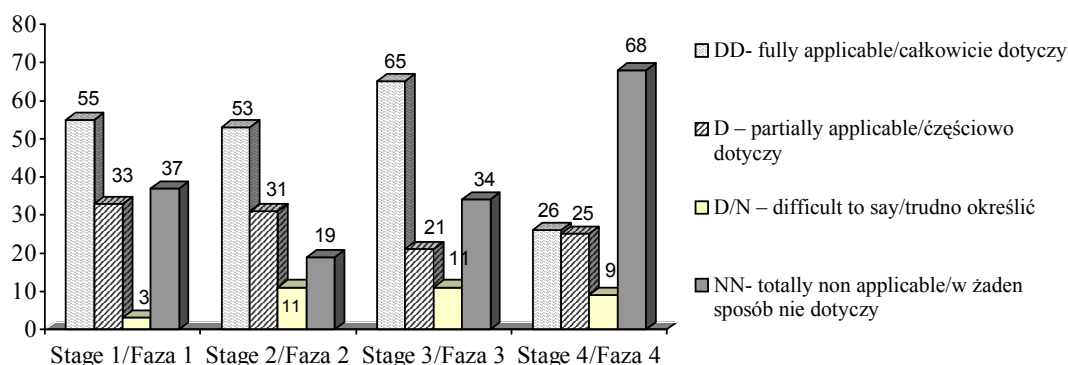
Application of the arithmetic mean for the intensity of features assessment (sub-criterion) resulted from the measurable character of features (assessment on the 1-5 scale). The absolute measure of the diversification was standard deviation<sup>7</sup> which allowed comprehending the internal character of the features (14 criteria of each development stage).

The studies using interview questionnaires were conducted in a horticultural cooperative<sup>8</sup> in Tarnowski district.

## Results

The checklist identifying the development stage, and elaborated on the basis of C.Pümpin and J.Prange [1999] method was used by a respondent to determine the degree to which individual analytical criteria (characterizing 4 stages: a/ start-up (entrepreneurship), b/growth, c/ maturity and d/decline) apply to the organization to which it belongs. The compilation of all obtained answers illustrates the structure of intensity of the characteristics for individual stages. The outline of this structure makes possible determining development stage at which the analysed company finds itself.

In the studied Horticultural Cooperative stage 3, i.e., the maturity elicited the highest number of answers with DD intensity (fully applicable) – 66 indications. On the other hand the greatest number of answers with NN intensity (totally non applicable) was elicited by stage 4 – decline (68 indications). The analysis of the obtained results (Figure 1) leads to the conclusion that the studied Cooperative is at the stage of transition from stage 1-start-up (entrepreneurship)(55 indications) and stage 2 – growth (53 indications) to stage 3 – maturity. The high number of answers DD for the stage 1 and 2 may be due to constant changes which occur in the Cooperative.



\*Stage 1= start-up (entrepreneurship), Stage 2=growth, Stage 3=maturity, Stage 4= decline

Source: own research

**Figure 1. The structure of intensity of features (SN<sub>i</sub>) characteristic for four stages\* of the cooperative according to the number of indications**

The obtained results (Figure 1) were affected by the assessments of criteria referring to the organization size, many-year cooperation (stage 3), product standardization (stage 2) and its permanent

<sup>7</sup> Standard deviation ( $STD_i$ ) is a square root of the arithmetic mean of the squares of individual feature value deviations from arithmetic mean. It informs on average how much the values of feature of individual units differ from their arithmetic means.

<sup>8</sup> The interview questionnaires were conducted with representatives of the management, producers and other cooperative staff (who were not producers).

inspection (stage 3), and senior age of its management (stage 4). It should be noticed that the current shape of the Cooperative resulted from numerous transformations (occurring since 1945). The Cooperative, which is a trading and service providing unit, has been constantly adjusting to the market requirements and the laws governing it, changing old cooperative habits to new ones.

The Cooperative managing body has been associated with it for eight years and is well knowledgeable about business, and maintaining business contacts with all clients.

For better diagnosing the stage at which the Cooperative is at present the degree of intensity of answers  $SN_i$  was calculated (mean value) as well as the degree of dispersion of answers  $STD_i$  – standard deviation.

Table 1

**Assessment of the Horticultural Cooperative stage of development made by quantitative method**

Specification	stage 1 entrepreneurship	stage 2 growth	stage 3 maturity	stage 4 decline
<b>Ki<sub>5</sub></b> (NN)	5.5	5.3	6.5	2.6
<b>Ki<sub>4</sub></b> (N)	3.3	3.1	2.1	2.5
<b>Ki<sub>3</sub></b> (D/N)	0.3	1.1	1.1	0.9
<b>Ki<sub>2</sub></b> (D)	1.2	2.6	0.9	1.2
<b>Ki<sub>1</sub></b> (DD)	3.7	1.9	3.4	6.8
<b>SN<sub>i</sub></b>	3.4	3.5	<b>3.5</b>	2.5
<b>STD<sub>i</sub></b>	1.7	1.5	<b>1.7</b>	1.6

Source: own research

The analysis of  $SN_i$  and  $STD_i$  parameter values for the subsequent stages of the enterprise development leads to the following conclusions:

- Diagnosis of the stage 1 – start-up (entrepreneurship)

Value of  $SN_1$  parameter = 3.4 approximates the answer “difficult to say”, while the value of standard deviation  $STD_1 = 1.7$  means great dispersion of answers – in practice between “totally non applicable” and “non applicable”.

- Diagnosis of stage 2 – growth

Value of  $SN_2 = 3.5$  is close to the answer “partially applicable”, while the value of standard deviation  $STD_2 = 1.5$  denotes no great dispersion of answers – closer to the answer “totally non applicable” rather than “non applicable”.

- Diagnosis of stage 3 – maturity

Value of  $SN_3$  parameter = 3.5 is approximate to the answer “partially applicable”, whereas the value of standard deviation  $STD_3 = 1.7$  means quite considerable dispersion of answers – in practice between “totally non applicable” and “non applicable”.

- Diagnosis of stage 4 – decline

Value of parameter  $SN_4 = 2.5$  is close to the answer “difficult to say”, whereas the value of standard deviation  $STD_4 = 1.6$  means quite considerable dispersion of answers – in practice approximating the answer “non applicable”.

### Summary and conclusions

1. Studies conducted on the development stages using Pümpin and Prange checklists method revealed that the analysed cooperative **is the most strongly embedded at stage 3 – maturity**. It is evidenced by an approximate value of the degree of maturity stage intensity ( $SN_3 = 3.5$ ) and standard deviation value ( $STD_3 = 1.7$ ).
2. The results of diagnosing the development stages of the Cooperative using quantitative method were corroborated by the results of qualitative method. In the qualitative method both the start-up (entrepreneurship) stage and the maturity stage were characterised by a definite prevalence of statements *applicable* to the organization over the *non applicable* statements.
3. Currently dominant stage of the cooperative maturity is a period of “harvesting the yields” of the investments from the previous year. The main goal of investments made at the maturity stage should be the maximisation of cash flow.
4. Specific character of horticultural production, the style of gardeners’ work and consumer expectations force the cooperative to seek new opportunities of development which are associated with strengthening its position on the market through creating economically strong unit with a powerful logistic and trading centre in the organization headquarters. Investment outlays on modernisation and repair of fruit and vegetable wholesale storage facility, as well as ongoing modernising of fixed assets (buildings and other facilities) and increasing the number of their means of transport will allow the cooperative to extend its operational area and place its commodities on external markets using **diversification strategy**. The cooperative can implement the strategy of generating positive links with its clients or use the strategy of influencing the environment creating a producer group.

The checklists method is a useful tool for organization management. The analysed cooperative uses the checklist method to determine the cooperative’s real state and development strategy.

### References

1. Antoszkiewicz J.D.(red) 2006, Metody zarządzania, Wydawnictwo Poltex, Warszawa, s. 141
2. Bennis W., Changing Organizations, McGraw-Hill, New York, 1966.
3. Carr, D.K., Hard, K.J., Trahan, W.J. 1996, Managing the Change Process, McGraw-Hill.
4. Drucker, P. (1985): Innovation and Entrepreneurship. Practice and Principles. New York 1985.
5. Yves-Frédéric Livian 2001, Organisation. Théories et Pratiques. Dunod. Paris.
6. Pümpin C., Prange J. 1999, Management der Unternehmensentwicklung, Phasengerechte führung und der umgang mit krisen, Campus Verlag, Frankfurt.
7. Szpilt A., Fudaliński J (pr.zb) 2002, Strategie rozwoju organizacji. Wydawnictwo antykwa, Kraków. Egospodarka <http://www.egospodarka.pl/23181,upadlosci-firm-w-polsce-i-vi-2007,3,39,1.html>



## **Rural Tourism as a Form of Non-farming Business Activity in the Polish Countryside**

PhD Barbara Gołębiewska

Department of Economics and Rural Enterprises Organisation,  
Faculty of Economics, Warsaw University of Life Science

### **Abstract**

In many countries the development of rural tourism is playing a more and more significant role. In the European Union, as well as in Poland, this form of tourism is becoming an important element in the business activities of farms and gives the opportunity to employ a lot of people, for example, in accommodation and catering services, in trading and organisation of cultural events, or in landscape care.

The paper discusses the role of agrotourism in the development of Poland's countryside areas, based on the example of Ostrołęka region. The attention is drawn to primary factors behind agrotourism business development, institutions and organisations supporting agrotourism development as well as the impact of agrotourism on improving the economic situation of farmers and local communities.

The research concerning agrotourism farms was performed in 2006 among the farmers providing the above mentioned services in the region of Ostrołęka. A survey questionnaire was developed, followed by direct interviews performed at each farm.

**Key words:** private farms, rural tourism, non-farming business

### **Introduction**

The importance of rural tourism has been growing in recent years. This is proved by the fact that in Western European countries rural tourism fulfils 10% of the demand for holiday services and, on average, 3-5% of arable farms provide such services. The increase in tourism employment in EU rural areas is bigger than in urban centres and is related mainly to recreational services.

Local communities in Poland are also starting to notice the benefits of rural tourism. Rural tourism and farm tourism services offer the possibility to create new positions and increase farmers' income. The changes that take place in agriculture generate a demand for alternative or additional sources of income for people living in rural areas. It is desirable that this income comes from a business activity other than agricultural production, and this can be rural tourism.

The purpose of the paper was to identify the conditions for development of agrotourism in the region of Ostrołęka as well as contribution of this form of business activity to limiting (reduction) of unemployment in the countryside. Based on a survey questionnaire, empirical research was conducted in order to examine the agrotourism facilities and development potential of such farms. Twenty farms from the region of Ostrołęka were included into the survey, accounting for over 80% farms conducting agrotourism business in this region in 2006.

Moreover, the paper discusses the general condition of agrotourism farms in Poland, including description and evaluation of the role of agrotourism in rural development. As mass statistics data in Poland do not specify the number of farmsteads conducting business in the domain of agrotourism, it is difficult to perform detailed comparisons of this business with the general situation in the country. In Poland, farmers who want to establish agrotourism farms are not obliged to officially register this form of business, and therefore, evaluating the number of actually operating agrotourism farms is difficult. The act "Business Activity Law"<sup>9</sup> of 19 November 1999 stipulates that agrotourism services rendered by farmers do not constitute business activity, as in most cases for farmers they constitute an additional, not related to agriculture source of income. Thus, farmers are not obliged to register that activity at the office, but must report it to the gmina and the tax office. Exemption from the registration obligation depends on satisfaction of one condition by farmers – accommodation facilities of an individual agrotourism farm may not exceed 5 rooms. On the other hand, agrotourism farms maintained by the countryside residents who are not farmers – and thus, they do not pay the agricultural tax – are treated in a different manner.

---

<sup>9</sup> Dz.U. nr 101, poz. 1178 ze zm.

### Agrotourism as a form of countryside tourism

The Polish term “agrotourism” (consisting of the two words “agro” and “tourism”), precisely reflects the meaning and essence of this branch of business. Agrotourism is a form of countryside tourism, strictly connected with agriculture and operating farms.

Agrotourism is referred to as a form of leisure directly at a farm, connected with observation and participation in the daily activities of its residents, along with the opportunity to use the farm’s produce as well as other offers proposed by the given farm. In short, agrotourism is a form of countryside tourism directly connected with agriculture. Therefore, only that activity which is conducted in agricultural areas, using vacant rooms and (adapted) farming buildings owned by farmers as well as the produce and services of their owners can be referred to as agrotourism [Dębniewska M., Tkaczuk M., 1997].

Understanding of the term “agrotourism” differs between tourists and providers of agrotourism services. To a tourist, agrotourism denotes tourism activities of a person who intends to familiarise himself or herself with agricultural production and/or rest in an agricultural environment. Providers of agrotourism services cover by the above notion various forms of accommodation, catering, leisure, recreation and sport services as well as those related to medical services and rehabilitation [Sznajder M., Przezbórska L., 2006].

The main idea of agrotourism is that an agricultural farm is the primary provider of agrotourism services. This enables farmers to increase their income and constitutes a fundamental incentive to undertake business activity related to agrotourism. Business activity related to agrotourism may be undertaken in case of certain natural conditions which, together with capital employed, allow the farmer to provide such services.

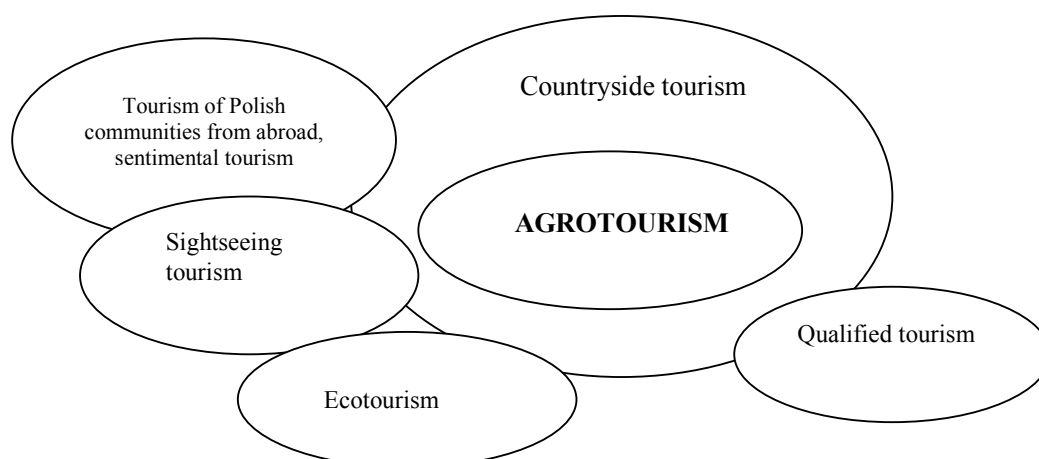
Agrotourism is different from other forms of tourism in terms of:

- space – freedom, fresh air, close contact with the nature, cultural heritage, etc.;
- existence of an agricultural farm and its usual rhythm of life and work;
- certain lifestyle in the countryside – each region has a unique character;
- costs of stay – various methods of reducing the costs of stay (e.g., for helping on the farm, own cooking) [Mikuta B., Żelazna K., 2004].

Figure 1 presents the relations between different kinds of tourism. The research of the tourism market in Poland proves that growing popularity of agrotourism results from changing motives behind the behaviours of large cities’ residents who are the main buyers of tourism services. More and more frequently they replace the existing model of passive leisure with getting to know their country and its inhabitants, live contact with natural environment and different countryside landscape. Moreover, people on holiday want to enjoy silence, freedom from the crowd, clean air and active exploration of open space. Considerably lower costs of staying with farmers’ families are often an important factor. In various regions of Poland, agrotourism is developing at a different pace. The phenomenon has been noticeable since the beginning of the 1990s. Greatest interest is enjoyed by regions characterised with special tourist attractions, offering excellent conditions for leisure, and where the nature has been altered by man to a small extent only [www.agroturystyka.endi.pl].

Persons undertaking business related to agrotourism personally, without employing any staff, are not obliged to report this activity to the register of business activity. This activity can be treated as rental or as secondary profit making activity. The business may also be conducted jointly by a family residing on one farm. Pursuant to the Act [Dz. U. nr 133, 1997 r.], renting rooms or space to put up tents to tourists within a farm, performed by farmers, as well as sale of meals and provision of related services does not need to be reported to the register of business activity. Income from agrotourism activity must constitute a secondary source of income, which does not mean, however, that it must be lower than the primary income. The obligation of reporting to the register of business activity concerns those persons who employ staff, but also those who provide the services without another primary source of income. Business activity related to agrotourism and countryside tourism was not separately indicated in the Common Agricultural Census of 1996, and thus precise data from that period are missing. Statistical offices in Poland do not prepare reports concerning agrotourism accommodation facilities and rentable rooms.

According to the information obtained from the centres of agricultural consulting, at the end of 2000 agrotourism services were rendered by nearly 5,800 farms, offering over 51 thousand beds [www.rcie.lodz.pl]. Pursuant to the data of the Institute of Tourism, in 2007 the figures grew to, respectively, 8,790 farms offering over 87 thousand beds (Table 1).



Source: Balińska A., Sikorska-Wolak I., 2001: *Agroturystyka w Dolinie Bugu i uwarunkowania jej rozwoju*. Wyd. SGGW, Warszawa.

**Figure 1. Agrotourism versus other kinds of tourism**

Table 1

**Private accommodation facilities at agrotourism farms in 2007**

Voivodeships	Total facilities	All-year-round facilities	Seasonal facilities	Total beds	All-year-round beds	Seasonal beds
Dolnośląskie	592	562	30	6475	6178	297
Kujawsko-pomorskie	333	246	87	3544	2575	969
Lubelskie	408	294	114	3445	2463	982
Lubuskie	164	123	41	1615	1199	416
Łódzkie	167	116	51	1427	1035	392
Małopolskie	1590	1230	360	17927	14233	3694
Mazowieckie	378	273	105	3322	2561	761
Opolskie	112	84	28	1110	858	252
Podkarpackie	1074	807	267	8288	6592	1696
Podlaskie	629	447	182	5751	3998	1753
Pomorskie	770	542	228	7565	5227	2338
Śląskie	384	321	63	5296	4439	857
Świętokrzyskie	355	274	81	2896	2354	542
Warmińsko-mazurskie	869	597	272	8164	5432	2732
Wielkopolskie	474	369	105	4703	3702	1001
Zachodniopomorskie	491	343	148	5616	3862	1754
Ogółem	8790	6628	2162	87144	66708	20436

Source: Institute of Tourism, [www.intur.com.pl/bazy/kwatery/kw1.php](http://www.intur.com.pl/bazy/kwatery/kw1.php), [www.intur.com.pl/statystyka.htm](http://www.intur.com.pl/statystyka.htm)

The data included into Table 1 indicate high spatial differentiation in the number of facilities and beds in Poland. The highest number of agrotourism farms and beds in 2007 was recorded in the south-eastern regions of Poland (Małopolskie and Podkarpackie voivodeships). The above voivodeships are regions characterised with fragmented agriculture, whose income from agricultural production is insufficient to support families without additional sources of financing.

### **Primary factors supporting development of agrotourism business activity in Poland**

Numerous factors supporting development of the countryside tourism may be specified, including quick industrialisation and urbanisation of Western societies as well as transport improvements. Moreover, increased welfare and spare time allow trips to the countryside, where city residents seek experiences of a "different" kind. Long-term development of cities was accompanied by disappearance of traditional business activities, in particular – of agriculture in numerous regions. Therefore, by obtaining income from city residents curious of different experiences, the countryside communities may exploit tourism as an important force on the way towards revitalisation of a given area or region.

Two kinds of factors encouraging tourists to visit a given region can be distinguished. External factors include attractiveness of landscape in the given region and its saturation with attractions of historical value. Internal factors may include standard of tourism facilities, quality of agrotourism services, and standard of accommodation facilities and hospitability of farm owners. Uncontaminated natural environment is the most important factor which attracts tourists. Another incentive, of great importance to tourists, is cultural advantages of the region, interesting attractions, traditional crafts, dialects, regional dishes and folk events.

Yet another condition of tourism development is positive attitude of countryside residents towards tourists. Apart from the appropriate standard of agrotourism farms, polite service and kindness of farmers are considered by tourists to be the key elements behind success of the undertaking. In many cases, high tourism advantages of a village or region may be insufficient if the quality of service offered by a given agrotourism farm is unsatisfactory [Kłodziński M., 2002].

### **Institutions and organisations supporting agrotourism development**

The development of agrotourism is highly dependent on the support of various institutions and organisations. All institutions operate in the given environment pursuant to certain rules, and they affect economic and social development. Institutions are usually connected with the environment by certain relations and links of a different nature.

From among different institutions and organisations supporting development of agrotourism, a special role is played by local communities, units of territorial self-government and institutions of government administration. They participate in making decisions concerning the organisation, operation, and development of technical and social infrastructure. Institutions and organisations supporting agrotourism business in Poland include:

- territorial local governments;
- agrotourism associations;
- centres for agricultural consulting;
- chambers of agriculture and tourism;
- Agency for Restructuring and Modernisation of Agriculture;
- Agricultural Market Agency;
- Ministry of Agriculture and Rural Development.

Territorial local government units influence the creation of social and economic infrastructure. They make decisions concerning development of the countryside, road networks, health care and regional culture of gminas. Moreover, they decide on the distribution of funds allocated to the extension and modernisation of cultural and tourism facilities.

Local government institutions such as agrotourism associations are also playing an increasing role. They associate agrotourism farms, secure the interests of service providers and clients, as well as support, promote and monitor business activity related to agrotourism.

On the regional level, the Centres for Agricultural Consulting are institutions of particular importance. They arrange training programmes and courses for farmers interested in agrotourism, provide consulting and promote agrotourism services.

The Ministry of Agriculture and Rural Development and the Agency for Restructuring and Modernisation of Agriculture, whose operation includes distribution of the EU assistance funds in this sector, play an important role in agrotourism development. Plans for the years 2007-2013 foresee the assistance for the development of agrotourism and tourism in the countryside areas by – among others – creation or modernisation of tourist information databases and web sites, development and publication of folders and other informative publications for areas covered by the Local Development Strategy, establishment and re-

establishment of small tourism infrastructure – in particular of vantage points, leisure and camping sites, cross-country and downhill skiing routes, cycling paths, walking and didactic paths [www.minrol.gov.pl].

The Polish Federation of Country Tourism “Hospitable Farms” plays a very important role throughout the country. This non-profit organisation has operated since 1996 and associates 40 local and regional associations. The associations unite individual accommodation providers conducting agrotourism and countryside tourism business. Not only does the Federation make sure agrotourism and countryside tourism develops in an intensive manner, but above all on a proper level. The organisation aims to consolidate all organisations dealing with countryside tourism and annually organises a series of training programmes for representatives of all environments, which integrate activities connected with development of tourism. Moreover, it ensures common promotion, advertising and sales of agrotourism products [Drag K., 2003].

The activity of Holland-based ECEAT (European Centre for Ecological Agriculture and Tourism) should also be appreciated. Its Polish branch is an association whose main objective is supporting ecological agriculture through ecological tourism at farms. The hosts are mainly farmers running their farms in compliance with the criteria of ecological agriculture, accommodating tourists and, moreover, enhancing ecological awareness among visitors to their farms [www.eceat.pl].

### **Agrotourism services in the light of empirical research**

Civilisation progress in the countryside includes increased efficiency of agricultural farms, the need to create new jobs, development of small business related to services provided for the countryside residents including agriculture, as well as of services for visitors (tourists). Creation of new jobs in the countryside has become an important task for territorial local governments, local administration, associations and residents [Sikorska A., 2002].

Conducted in many countries, observations of economic activity of farmers’ families in the field of tourism indicate that this kind of activity is mainly the result of search for additional or alternative income in numerous sectors surrounding agriculture, as agricultural production is becoming less profitable and the countryside residents’ standard of living is deteriorating. Particular need to improve the situation of agricultural farms is observed in Poland, where the market economy, whose development is encountering difficulties, has faced countryside residents with significant limitations in terms of possibilities to sell agricultural produce due to low and unstable prices along with growing costs of production, relatively high unemployment, limited opportunities of professional promotion for countryside youth and deteriorated standard of living. Considering the above, reconstruction of the Polish countryside may to a great extent take place through changes in the non-agricultural sector, resulting in creation of new jobs in numerous sectors around agriculture and stimulating the activity of countryside residents with respect to seeking alternative methods of using the resources of their farms and of natural advantages of the countryside.

Landscape, environment and culture related advantages of Ostrołęka region make it an area attractive to tourists. Cultural and natural environment constitutes basis of the tourism product offered by that region.

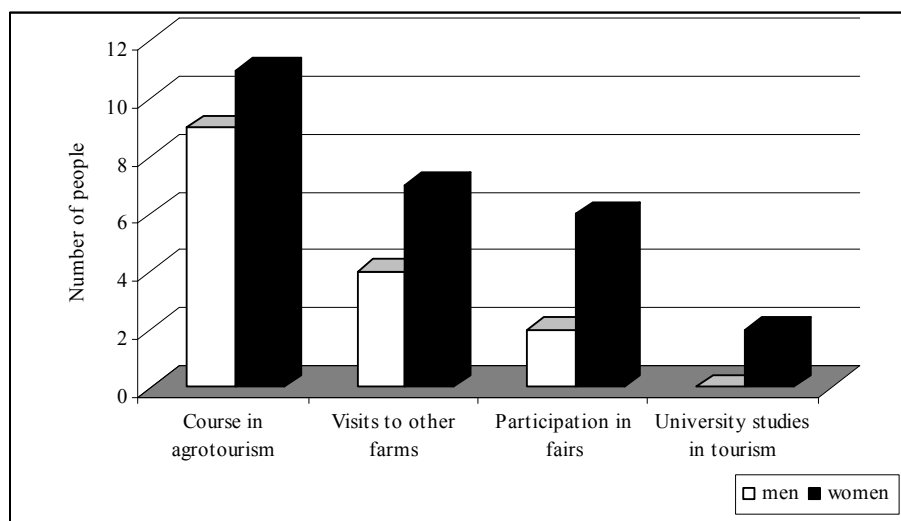
Twenty farms, including 55% run by women, were selected for the research. This was caused by the fact that accommodation of guests at the farms was usually handled by women. Active participation of men was nearly completely limited to arranging additional services for tourists.

The respondents’ background for conducting agrotourism business was different: all of them completed a course in agrotourism, but only two of them completed university studies in tourism (Figure 2).

As evidenced by the conducted surveys, additional income was emphasised by the respondents as one of the main motives behind undertaking and development of agrotourism business. However, numerous replies (25%) indicated fulfilment of own passions as the main reasons for starting up an agrotourism farm.

Nearly 90% owners of agrotourism farms used credits for starting their business. This percentage is significant, as in case of typical farms the farmers are reluctant to using external financing. Women drew credits more frequently (100% respondents).

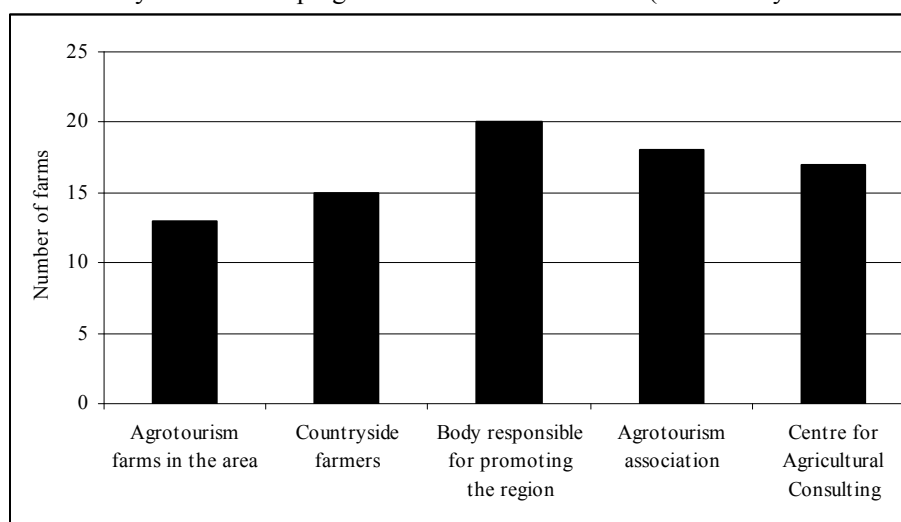
Among various institutions and organisations operating in the region of Ostrołęka, the units of territorial local government were of greatest importance (Figure 3). All questioned respondents declared to be cooperating with a body in charge of promoting their region. 90% of the farmers belonged to an Agro-Tourism Association, and most of them also cooperated with a centre for agricultural consulting.



Source: Own research

**Figure 2. Background for conducting agrotourism business**

Many experts dealing with the issues of agrotourism claim that it constitutes an opportunity to create new jobs and additional sources of income for countryside residents. However, only 5% of the respondents declared to be thinking of creating new jobs for gmina residents. On the other hand, when a respective survey was conducted, nobody employed additional staff for conducting the agrotourism business, as the number of family members helping on the farm was sufficient (each family consisted of at least 3 adults).



Source: Own research

**Figure 3. Cooperation with institutions and organisations**

Smallest (3-person) families declared their will to employ staff in the future, but that depended on their revenues and development of the business; the survey indicated that 29% respondents believed it would be difficult to find candidates for work as the salaries the farmers would be able to offer would not be interesting to the residents.

### Conclusions

1. Current transformations of agriculture create among countryside residents a demand for alternative or supplementary sources of income. It would be desirable for the income to come from different economic business than agricultural production. The research indicated that the most important motive causing farm owners to undertake agrotourism business activity was the economic one, which seemed justified considering decreasing income from agricultural production. One of the important reasons for the development of agrotourism business activity was also the possibility to fulfil the respondents' passions, and thus in most cases agrotourism farm owners were running them by avocation.
2. The creation of a proper agrotourism basis involves securing sufficient funds. Unlike typical agricultural farms, many owners of agrotourism farms used external sources of financing. All the surveyed farms were run by owners and their families, without employing additional staff.
3. The development of agrotourism does not only depend on farmers themselves, but also on the support of institutions and organisations, with a special role played by territorial local governments, centres for agricultural consulting and agrotourism associations. All these institutions operate in the region of Ostrołęka, and the surveyed farmers benefited from their services and supporting activities.
4. In contrast to mass tourism offered by the tourism industry, countryside tourism enables close contact with the nature, the possibility to get to know local culture and customs, as well as to eat healthy food. Numerous regions in Poland are attractive at the European scale in terms of natural environment. The establishment of an efficient and easily accessible system of information and booking of tourism services will result in growing interest in countryside tourism among both foreigners and Poles. Expenditure on promotion and advertising, which should allow popularisation of tourism among a broad group of customers is underestimated in Poland.

### References

1. Balińska A., Sikorska-Wolak I., 2001: Agroturystyka w Dolinie Bugu i uwarunkowania jej rozwoju. Wyd. SGGW, Warszawa
2. Dębniowska M., Tkaczuk M., 1997: Agroturystyka, koszty, ceny, efekty. Wyd. Poltext, Warszawa.
3. Drag K., 2003: Działania Polskiej Federacji Turystyki Wiejskiej „Gospodarstwa Gościnne” na rzecz rozwoju i promocji turystyki wiejskiej w Polsce. Zeszyty Naukowe Akademii Rolniczej im. H. Kołłątaja w Krakowie nr 402. str. 129-131. [www.agroturystyka.edu.pl](http://www.agroturystyka.edu.pl)
4. Instytut Turystyki, [www.intur.com.pl/bazy/kwaterny/kw1.php](http://www.intur.com.pl/bazy/kwaterny/kw1.php), [www.intur.com.pl/statystyka.htm](http://www.intur.com.pl/statystyka.htm)
5. Kłodziński M., 2002: Przedsiębiorczość wiejska w Polsce i krajach Unii Europejskiej, Warszawa: IRWiR PAN 2002, [www.euroinfo.org.pl](http://www.euroinfo.org.pl)
6. Mikuta B., Żelazna K., 2004: Organizacja ruchu turystycznego na wsi. Wyd. Format A-B, Warszawa.
7. Sikorska A., 2002: Problemy nierolniczej działalności gospodarczej na obszarach wiejskich. W: Rola małych i średnich przedsiębiorstw w rozwoju regionalnym. WSE, Warszawa, str. 343.
8. Sznajder M., Przezbórska L., 2006: Agroturystyka. PWE, Warszawa.
9. Act on tourism services. (Dz. U. nr 133 z dnia 29 października 1997).
10. [www.agroturystyka.endi.pl](http://www.agroturystyka.endi.pl)
11. [www.eceat.pl](http://www.eceat.pl)
12. [www.minrol.gov.pl](http://www.minrol.gov.pl), [www.fundusze-turystyka.pl/](http://www.fundusze-turystyka.pl/)
13. [www.rcie.lodz.pl/docs/Dzialanie\\_w\\_zakresie\\_agroturystyki\\_i\\_turystyki\\_wiejskiej](http://www.rcie.lodz.pl/docs/Dzialanie_w_zakresie_agroturystyki_i_turystyki_wiejskiej). Developed at the Department of Rural Development, Ministry of Agriculture and Rural Development.

## **Marketing Channels on the Food Market in Poland (on the Example of Cereal Sector and Vegetables Fats)**

PhD Jarosław Gołębiewski  
Faculty of Economics  
Warsaw University of Life Science

### **Abstract**

Marketing channels for food products are constantly changing. In Poland, these changes were developing over the last 20 years by the processes of the economic system reconstruction, and European integration processes. During these changes, new wholesale and retail institutions occurred, and new types of food distribution channels developed. This study includes an attempt to identify the main types of marketing channels at two markets of vegetable products, i.e., cereal product market and vegetable fat market, as well as to specify meaning of the respective types of these channels in distribution of selected food products.

Based on the research conducted in enterprises of the cereal industry and in the companies involved in the vegetable fat processing, the main types of marketing channels were identified, and organisation models of the distribution system of cereal products and vegetable fats were built. Based on the data coming from monitoring of the retail trade, the significance of the main types of channels was defined in the distribution structure of selected cereal products and vegetable fats.

**Key words:** marketing channel, food market, cereal sector, vegetables fats

### **Introduction**

Food products are provided for the consumption area through various marketing channels. In general meaning, marketing channels constitute a set of various institutions, agencies and enterprises, which are interdependent, and which are participating in the process of transfer and delivery of food to consumers, as well as respective institutions, specializing in the trade of agricultural products, manufacturing of food products, wholesale sales, retail sales, shipment, warehousing and many other areas.

In Poland, within the last 20 years, total rebuilding of the marketing channels for food products has taken place. These changes were determined by various factors. At the beginning of the 1990s, there were mainly system transformation processes, within the first years of this century, the processes of integration with the European Union have occurred, and recently there have been conditions for functioning in the single European market, processes of internationalisation and globalisation of enterprises, and development of new technologies in the sphere of logistics and communication. These processes formed the new subjective and organisation structure of marketing channels for food.

**The aim of the research:** to present the whole structure of marketing channels at the cereal product markets and vegetable fat markets in Poland. The main tasks of the research:

- 1) to establish the main types of distribution channels for the cereal products and vegetable fats;
- 2) to define the significance of these channels in distribution of the respective food products.

Source basis for this study includes literature on this subject, research on enterprises involved in the cereal and milling processing (22 companies in total) and vegetable fats processing (10 companies in total) conducted in 2006, which allowed the identification of typical marketing channels occurring at the market of the cereal products and vegetable fats in Poland. To specify the significance or the respective types of channels in distribution of the basic cereal and fat products, the research data from Retail Trade Panel of the company ACNielsen were used, which were published in specialised publications. This data allowed analysing changes in the structure of these channels within 2003-2006. In this case, the analysis included breakfast cereals and margarine. The study also comprises the data of the mass statistics.

### **1. Marketing channels and chains of food products**

Food products as many other consumer goods are delivered on the market by the agency of various marketing channels. As Stern and others show, the marketing channels can be regarded as sets of organisations, dependent on each other, participating in a process of delivering a product or service to the



consumption or usage [Stern L.W., A. I. El-Ansary, A.T. Coughlan, 2002]. Individual institutions that specialise in production, wholesale and retail cooperate in constructing the marketing channels enabling to deliver goods to consumers. On the one hand, the marketing channels are responsible for meeting demand through delivering the products to an appropriate place, at an appropriate price, but on the other hand, they stimulate demand through promotion action of individual units being part of them. Therefore a marketing channel is regarded as a connected chain which delivers value to final users. The marketing channels consist of interdependent institutions. The results gained by individual participants of the channel depend on other entities as well. Such interdependence causes the fact that the marketing channel can be regarded as a system. Stern and others underline that the marketing channel is a system of mutually connected and interdependent entities aiming at achieving a concrete purpose [Stern L.W., A. I. El-Ansary, A.T. Coughlan, 2002].

The marketing channels undergo continuous changes. Kotler pointing at this process pays attention to new appearing wholesale and retail institutions and new types of channels in the form of horizontally and vertically integrated marketing systems, and multi-channel marketing systems [Kotler P., 2005]. In contrast to conventional marketing channels which consist of independent entities (producer, wholesaler, retailer) maximising their own profits, vertically integrated systems consist of various links functioning as a whole. As Czubała underlines, in vertically integrated channels, the activity of companies appearing on various levels of a channel is coordinated and controlled by one company. The coordination can include all participants or only some levels of the channel [Czubała A., 2001].

## **2. Sales organisation and distribution channels of cereal industry products**

Marketing system of the cereals reveals a significant complexity. It is created by the system of various entities, functions and institutions participating in transformations of the cereal grains (wheat, rye, barley, oat, corn) into the final food products. Cereal production in Poland plays a significant role in agricultural production. Approximately 70% of the arable land (68.2% in 2005) is allocated for cereal cultivation, i.e., over 8 million hectares. Annual production of the grain in Poland ranges from 22 to nearly 30 million tons. The most significant in the structure of production is wheat, which harvests in recent years have ranged from 7 to nearly 10 million tons. There are various uses of the cereal grains in the economy. In the main part, it constitutes the base for production of fodder and cereal products intended for direct consumption. Dominating direction of the use is fodder production. In 2000-2005, depending on the year, from 13 to nearly 17 million tons of grain were intended for this purpose. Approximately 5.7 million tons are intended in Poland for the purpose of the direct consumption. Insignificant percentage of the cereals goes to the industry (approximately 1.1 million tons)<sup>10</sup>.

Cereal grain is the component and the basis for production of many various food products, such as flour, porridge, and breakfast cereals. Production of the breadstuff, crisp bread, pasta, and production of cakes and cookies is also based on flour, which is the main product of the milling industry.

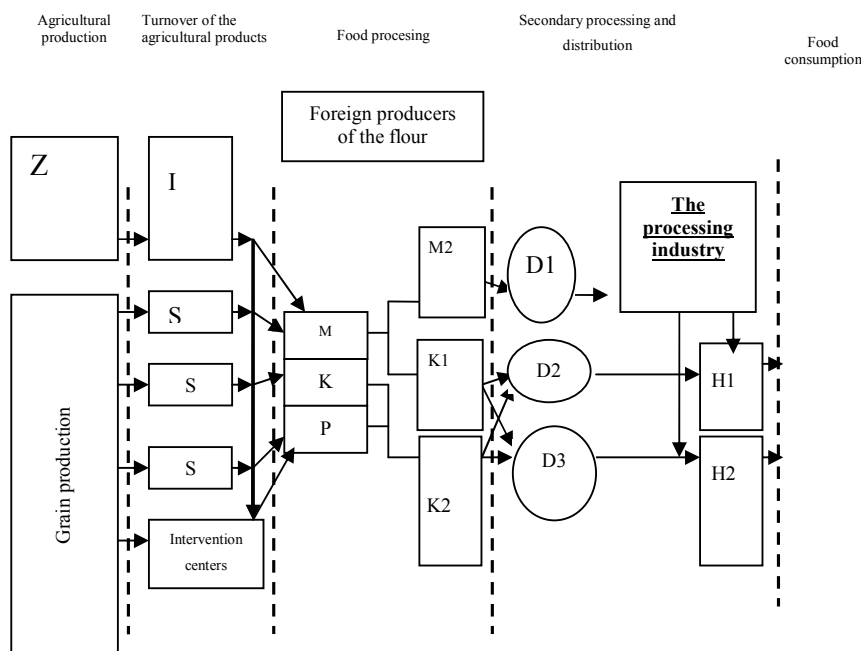
The structure of the marketing system of the cereal products, describes the main participants of this system and the role, which that play. The analysis of the marketing system of the cereals indicates that many various forms of marketing and production nature are involved in purchasing, trade, warehousing, standardisation and quality evaluation, processing and distribution of the cereal grains for the farms to the final consumers.

Figure 1 presents the model of the delivery network structure for food products manufactured on the base of the cereal grains.

The model includes the main links and relations occurring in case of consumption products. There was a focus on three basic food products, i.e., flour, porridge and flakes. The flour is the most important product obtained from the cereal grains. It is extensively used in households and in baking, pasta and confectionery industry. Porridge and flakes not only enrich our diet (direct consumption), but also may be the raw material for production of highly processed cereal products (e.g., cereal flakes of musli type).

---

<sup>10</sup> Rynek zbóż- stan i perspektywy, IERiGŻ-PIB, 2006.



Source: Own research

**Figure 1. Diagram of the marketing system of the cereal grains agricultural production**

Z- foreign producers of the cereals, I- importers of the cereal grains, M- mills, K – oat mills, P- flake production plant, M1 – production flour, D1- flour distribution to food industry, D2 – distribution to the wholesale, D3 – distribution to the retail network, M2 – warehousing and standardization of the production flour, K1 – flour packaging, K3 – packaging of the cereal products, H1 – traditional retail sales, H2 – network retail sales S - procurement

Sales of the cereal-milling products such as flour, porridge, traditional flakes, breakfast cereals, and pasta may take place in various distribution channels. Significance of the respective channels also depends on type of the final product. The research conducted on the enterprises of the cereal-milling sector allowed for selection of the following distribution channels of the cereal-milling products:

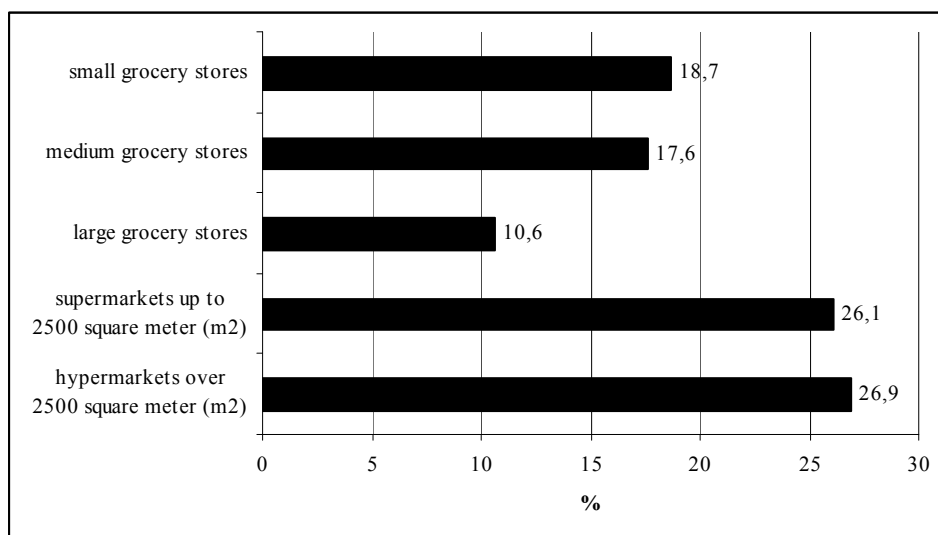
- trade chains (hypermarkets, supermarkets and grocery discounters) – sale under their own brands of trade chains and under producers' brands;
- wholesale trade – sale of products under producers' brands and occasionally under wholesalers' brands. Then the wholesalers resell the products to the outlets, institutions, places of collective nutrition, etc.;
- institutional sale – channel including sale to institutions and organisations, where contracts are concluded in the form of tender (army, government agencies);
- export sale.

The market of trade chains has been developing dynamically since the middle of the 1990s. The trade chains introduced products under their own brands of chains into the Polish market. The chain market is characterised by huge requirements in the scope of the size of deliveries. Purchase possibilities of the chain often exceed delivery abilities of smaller producers.

The traditional trade includes small, medium and large stores acting outside the organised trade chains, supplied by small, medium and large wholesalers and, more and more rarely, directly by the producers. Some specialised wholesalers classified into a traditional channel use solutions, concerning the way of management and distribution, typical for trade chains. The solutions include, e.g., offer of products under their own brand, as well as central purchase management of producers, and central management of sale structure in the stores supplied by these wholesalers. The traditional distribution channel includes over 100,000 grocery stores in Poland. The sale through this channel requires formation of sale regions from the producers; managers of sale regions cooperate with distributors and coordinate the work of trade representatives.

The sale to institutions and organisations such as army, hospitals, and places of collective nutrition is executed on the conditions of contracts concluded in the form of tender. This channel includes also the Agricultural Market Agency within the framework of Aid Programme for the poorest people of the EU. Functioning on this market requires the appropriate production capacity, possibility of achieving financial guaranties of due and proper execution of the contract from financial institutions and efficient logistics which will secure the delivery of huge amounts of goods.

The results of breakfast cornflakes market research presented in Figure 2 show that in this segment over 50% of retail is carried out by the large-area trade.



Source: AC Nielsen research results, published in specialised press

**Figure 2. Market of breakfast cornflakes: location of sales, value shares (VI 2003 - V 2004)**

The significance of foreign trade in the cereal sector changes over the time, and it depends on the situation on an internal market. Deficit of cereals in the country increases import and vice versa, their surplus causes a bigger interest of entities in foreign markets. The research of mill industry and industries engaged in the secondary processing of cereals demonstrates that two ways of organising this activity are possible. The first one consists in a direct sale within the framework which the producers organise, in their own scope, the export sale through their own trade services. According to the opinion of representatives of researched enterprises it is used relatively very rarely. The second solution consists of entering the foreign markets through the sale by means of specialised distributors operating on these markets. The analysed companies identified the solutions of such a type significantly more often.

The cereal product import was carried out most often through specialised distributors who supplied retailers through their own or external dispatch companies, importing the goods from abroad and then distributing them to trade chains and gastronomy, using their own or hired carriers. The executed research also shows that import transactions did not base on long-term contracts. Most contracts of cooperation, including the contracts for exclusivity with brand deliverers were not formalised. The cooperation is based on confidence and long-lasting partnership.

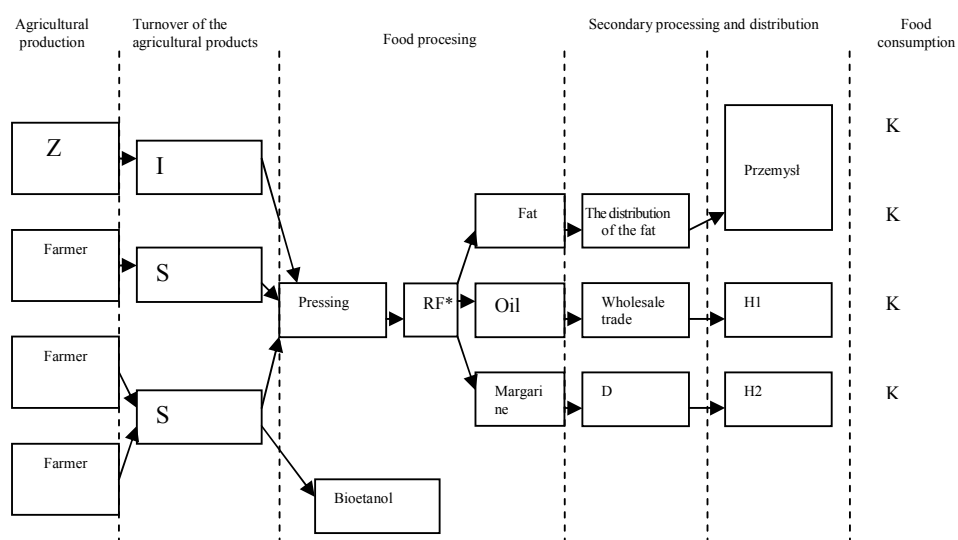
Poland's access to the EU, according to the opinion of distributors carrying on trade operations with foreign countries has significantly reduced logistic costs, in particular, transport costs, as prior to 2004 the transport of food required a detailed control on every border. After the access to the EU the border procedures are limited to the minimum, thus causing faster transportation and cheaper food.

### 3. Marketing channels of fat product industry

Cultivation of the oil plants has great economic importance in Poland. The most common oil plants are the rape and the agrimony. The share of such remaining cultivations as mustard, oil pumpkin, oil flax or sunflower in production is insignificant. In 2005, approximately 1.4 million tons of the rape and the agrimony were produced in Poland, on average harvesting at the level of 25.4 dt/ha. Over 550 thousand ha of the arable land was intended for cultivation. Production of the rape in Poland is subjected to strong volatility. In 2003, it was only 0.8 million tons, but within the next year, it doubled and exceeded 1.6 million tons. Generally, in recent years, the rape production was oscillating around the level of 1 million tons per year. Since 2004, it has been maintaining the level of 1.4-1.6 million tons<sup>11</sup>.

The rape is used as the raw material in fat industry. It constitutes the basis for the production of margarines and oils intended for consumption. The sector of biofuels is a new, perspective area for the use of rape. In this case, the rape oil may be a component in the production of diesel oil (biodiesel).

Organization and structure of the delivery networks of fat products is typical for agricultural products, which require processing. Such links as the agricultural production, purchase area, warehousing and turnover of the seeds, fat industry and the area of distribution of vegetable fats have great significance in the delivery chain. Figure 3 presents the diagram of the marketing channel structure for the fat products in Poland together with connections with foreign markets and other marketing systems such as fuel sector.



**Figure 3. Structure of the marketing system of the oil plant seeds**

Source: Own research

\*RF- refining

Z- foreign producers of the oil plant seeds, I- importers of the oil plant seeds, D – distribution to the retail network, H1 – traditional retail sales, H2 – network retail sales S - procurement

The fat industry offer includes: refined oils (rapeseed, soybean, sunflower oils), margarines, specialised fats (confectioner's fats, fats for stuffing and creams, fats for confectioner's icing, fats for production of consumable concentrates, fats for frying) and raw oil, and post-extraction meal.

Four types of sale channels can be distinguished in the distribution system of fat product industry:

- traditional channels;
- chain channels (so called Key Account);
- professional channels;

<sup>11</sup>Roczniki Statystyczne GUS 1990-2006

- channels of mass products.

The first two channels concentrate on the sales of bottled oil and consumer margarines. The professional channel is designed for the sales of margarines in blocks and confectioner's fats. The channel of mass products includes the sales of raw oil, meals and special fats.

Analysing the structure of distribution channels of products intended for supplying final consumers it is necessary to distinguish the channels of edible oils and margarines. In Poland the market of edible oils is consolidated and dominated enough firmly by few main producers.

The sale of vegetable oils is carried on in Poland through a traditional channel and a channel determined as Key Account. The development of sales networks that enable reaching the most possible number of wholesale and retail points, and secure the increase of product rotation on a store shelf is an essential strategy of all companies which produce the oils.

The structure of margarine sales channels in Poland is shown in Table 1. Small grocery stores and supermarkets –26% and 25% of sales value respectively – seem to be the most important in the structure of trade outlets with reference to the purchase of yellow fats. However, the significance of supermarkets increases systematically at the cost of small and medium grocery stores.

Table 1

**Market of yellow fats: location of sale, value shares (VI 2003 - III 2006)**

Type of the shop	IV 2003 –III 2004	IV 2004-III 2005	IV 2005 –III 2006
Small grocery stores	26	15	15
Medium grocery stores	21	29	32
Large grocery stores	12	12	11
Supermarkets up 2500 m <sup>2</sup>	25	20	20
Hypermarkets over 2500 m <sup>2</sup>	17	23	22

Source: Retail Trade Panel AC Nielsen, Poradnik handlowca nr 7/2006

In case of professional products (professional margarines and confectioner's fats) fat companies use various distribution systems. The professional margarines are sold through the network of specialised distributors and wholesalers serving confectioneries and bakeries. However, the confectioner's fats are distributed through the network of distributors and direct deliveries to large industrial purchasers.

The professional channel is based on direct customers being distributors. The producers of vegetable fats cooperate both with the distributors, who strictly concentrate on the sale of professional products, and with the distributors engaged both in the trade of consumer and professional products. In the group of final customers, providing themselves with professional margarines and confectioner's fats through distributors, the customers whose companies are served directly by their own representatives are singled out as well.

The distribution of mass products is based on the system of direct sales. Sales Departments of Mass Products of fat companies are engaged in the sales of refined oils (rapeseed, refined soybean, sunflower oils), confectioner's fat, technical lecithin, raw rapeseed oil and raw soybean oil, fatty acids and special fats. The special fats are produced on the basis of specifications and special orders prepared by contracting parties. The refined oils are sold among others to the companies producing mayonnaise, fish products, and butter. The confectioner's fat with a various point of melting and special fats are produced to special orders and used, for example, for the production of cakes, creamy filling, soft stuffing, wafers. While the raw oils and fatty acids are used for making fodder oily.

The refined oils and confectioner's fats are delivered most often by the fat companies to their own customers by means of their own transport. Remaining goods are collected most often by the transport of the customers.

### Conclusions

1. Marketing channels for the cereals created entities involved in production and distribution of the seeds run from the area of agriculture to the area of consumption. The basic links of these channels, except for the agricultural production, are links of the wholesale trade for the cereal grains, milling industry, and distribution sectors in terms of the wholesale and retail trade. The significant user of the milling processing products are offers for the food industry involved in the production of breadstuff, pasta, cookies and breakfast cereals, which provide added-value to the products of cereal grains milling by processing them into food products.
2. Organization and structure of the delivery networks of the fat products is typical for agricultural products, which require processing. The following links in the distribution channels have great significance: agricultural production, purchase area, warehousing and turnover of seeds, fat industry, and distribution area of the vegetable fats.
3. The distribution system of the cereal and fat industry products in Poland is based on four types of the sales channels, they are as follows: traditional channels, network channels (so called Key Account), professional channels and mass product channels.

### References

1. Czubała A., 2001: Dystrybucja produktów, PWE, Warszawa. s. 27
2. Kotler P., Marketing, Rebis, Poznań 2005, s 529
3. Stern L.W., A. I. El-Ansary, A.T. Coughlan, Kanały marketingowe, PWN, 2002, s. 17
4. Retail Trade Panel AC Nielsen , Poradnik handlowca nr 7/2006.
5. Roczniki Statystyczne GUS 1990-2006

## Research on 5 Dimensions Cultural Model in the Regions of Latvia

Uldis Ivans, associate professor, PhD student, Latvia University of Agriculture

### Abstract

After joining the European Union the culture of organisation has started to occupy a very important position also in Latvia. European nations have different traditions. The author for the purpose of the research has used a questionnaire of the Institute for Training in Intercultural Management, which had been adapted for Latvia. The following 5 dimensions were viewed – Power Distance (PDI), Individualism (IDV), Masculinity (MAS), Uncertainty Avoidance (UAI), and Confucian Dynamism (CDI).

The aim of the scientific study is to investigate 5 dimensions of culture in the regions of Latvia. The main tasks of the study are to aggregate information, to do questionnaire, and to analyse the obtained results.

1894 residents of Latvia were involved in the questionnaire, including 1022 females and 872 males. The research covered residents of two nationalities – Latvians and Russians, and also their domiciles – Kurzeme, Vidzeme, Zemgale, Latgale, and Riga.

The research showed not too many differences of 5 dimensions between Latvian and Russian residents, which is explained by the fact that these two nations are living in the same country.

There were no many differences of 5 dimensions by the residents' domiciles, which mean that people of Latvia have similar attitude towards organisational culture.

There were no huge differences comparing the gained results of 5 dimensions with the data of the Institute for Training in Intercultural Management collected on the Baltic States. Thus it shows similar mentality between people of the Baltic States.

Power Distance (PDI = 31) indicator is low in Latvia, which means that hierarchy is for convenience and everybody has equal rights. Individualism (IDV = 45) indicator is also low in the country, which shows Collectivism – people belong to in-groups. Masculinity (MAS = 29) is low, which means that Femininity are the dominant values in the society. Uncertainty Avoidance (UAI = 37) also is low, which means that people do not show their emotions and they do not take a risk. Confucian Dynamism (CDI = 25) is low, which shows that people expect quick results, and they are spending for today.

**Key words:** organisation, culture, 5 dimensions cultural model

### Introduction

The aspect on the evaluation of the culture of organisation in the European Union has become topical with the accession of Latvia to the European Union (EU). Worldwide the Western culture is considered as a single entirety, yet the researches show that nations have different traditions. The author for the purpose of the study has used a questionnaire developed by Dutch Institute for Training in Intercultural Management, which was translated into Latvian and adapted for the conditions of Latvia. Five dimensions were viewed – Power Distance (PDI), Individualism (IDV), Masculinity (MAS), Uncertainty Avoidance (UAI), and Confucian Dynamism (CDI).

**The aim of the research** is to identify the cultural dimensions of the residents of Latvia by means of 5 dimensions cultural model.

The following tasks were advanced to achieve the set aim:

- 1) to study and aggregate information on the culture of organisation;
- 2) to questionnaire the residents of Latvia;
- 3) to summarise and analyse the obtained results of the questionnaire.

**Materials and methods.** The monographic or descriptive, statistic, synthesis, graphical, and analytical methods have been used for the purpose of the research. Literature comprising opinions of different authors on organisational culture, as well as the questionnaire developed by Dutch Institute for Training in Intercultural Management was applied in the research.

**Culture** can be defined as a system of norms, rules, abilities, values orientation, beliefs, and attitude, which by means of a symbolic help transfers information to the society, and as well implements the representative, directive, and affective function. Organisational culture is a notion subordinate to the culture of society; since the organisation is a cell of the society, part of a whole public relation.

**Organisational culture** is a relatively stable amalgamation of beliefs, values and social norms governing in an organisation, and which has established itself by strengthening an inner organisational integration and adjusting to the socio-economic environment. The mentioned beliefs, values and norms determine perception, way of thinking and feelings of the members of an organisation in relation to the problems of internal integration and external adaptation, reflects in the activities of organisational members and formation of organisational environment itself. Organisational culture also comprises such symbolic activities and elements as organisational myths, rites, ceremonies, style of leading, character of people interrelations, and organisational design (Stephen P. Robbin, Mary Coulter Management).

### **Basic functions of organisational culture:**

#### **Adaptation to the external environment**

Organisational culture ensures:

- comprehension of a common organisational mission and strategy, and harmonization of targets for the implementation of the mission;
- common understanding and harmonization of target achievement measures (organisational structure, division of labour, system of encouragement, hierarchy of power);
- agreement on the criteria for the achievement of the set targets;
- agreement on the changes in organisational strategy, in case the elected targets turn to be unachieved.

#### **Internal integration of an organisation, formation and strengthening of its identity**

Organisational culture ensures:

- use of common language and terms in the organisation;
- criteria for the acceptance of people in the organisation, and their future professional and power career;
- code of conduct in relations with the management, colleagues, representatives of the opposite sex, etc.;
- system of awards and sanctions due to which every organisational member is aware of either award or sanction for his/her action;
- ideology and system of common values, which enables to distinguish between the desirable and undesirable in the organisation.

A person becoming a member of an organisation gradually masters organisational culture; this fosters his/her integration into a particular organisation. A manager has to master a style and behaviour correspondent to the culture governing in the organisation; otherwise his/her efficiency would be effective only in the sphere s/he has acted before. Mainly managers are those who form organisational culture by embodying the values necessary for a successful operation of the organisation.

#### **Levels of organisational culture:**

1. The basic level of an organisational culture is presumptions of people on:
  - external environment and attitude towards it;
  - reality, time and space, human nature;
  - nature of human relations. These notions lay in an unconscious sphere of a human psyche, and only speculative judgement on the mentioned notions is possible due to their indirect expression in the other levels.
2. The system of organisational values and social norms forms the second level.
3. The third level represents external manifestations of organisational culture:
  - visible human actions expressing through organisational rites and ceremonies;
  - appearance of people;
  - interior and design of an organisation.



**Formation and significance of organisational culture.** Many mutually related factors determine the formation of a particular organisational culture. The key factors are as follows:

**Social environment.** Organisational culture is not isolated; it is always incorporated into a wider cultural context characteristic to a certain geographic region. The common cultural context largely defines the base assumptions, which form the basic level of organisational culture.

**Economic situation.** Market factors and the sphere of organisation activity play a significant role in the formation of organisational culture, where the impact of technological factors is considered to be special.

**Concrete persons in an organisation.** People are the actual carriers of organisational culture. The impact of socio-cultural and economic environment on organisational culture occurs through people in a mediated way. The idea of organisational personnel on the norms and values of organisational behaviour develop under the impact of the common cultural context. Formal and informal leaders of the organisation play the decisive role in the formation of organisational culture. Leaders of an organisation set the main organisational targets, ensure and promote the activities for the achievement of the set targets. Leaders with their personality and behaviour serve as model for other organisational members. Organisational culture is directly connected with organisational efficiency. It may be said that organisational efficiency depends on the power of organisational culture; therefore the manager shall pay attention to the investigation of organisational culture and leading of it into the desirable direction. Although a different opinion also exists – powerful cultures may advance organisational efficiency only in certain conditions – uncertainty in economic situation, stability of the personnel, and fair system of remuneration.

Organisational culture is very significant for the introduction of innovations in an organisation. It may foster positive changes, yet it may also become their obstacle. It is very difficult to alter already established organisational culture – it is a lasting and expensive measure. However, there are many situations when these changes are highly essential – fundamental changes in socio-cultural and economic environment, organisational inefficiency and noncompetitiveness, growing and expansion of an organisation.

**Culture** may also be defined as an expression of a collective mind (programming), which helps to distinguish one group or category of people from other. This programming influences the way of thinking, it reveals the manner people perceive different aspects of life. This way of thinking shows up in different public institutions. Yet it does not mean that the whole society is programmed identically; big differences shall be found among individuals and sub-groups of individuals. Not always the statements on culture describe the real situation. Cultural systems of nations and their subdivision are very complicated [Gert Jan Hofstede, 2005].

He has identified five dimensions of [culture](#) in his study of national influences:

- [power distance](#) - the degree to which the *less powerful* members of society expects there to be differences in the levels of power. A high score suggests that there is an expectation that some individuals wield larger amounts of power than others. Countries with high power distance rating are often characterised by a high rate of political violence. A low score reflects the view that all people should have equal rights. Latin American and Arab nations are ranked the highest in this category; Scandinavian and Germanic speaking countries the least.
  - [individualism vs. collectivism](#) - [individualism](#) is contrasted with [collectivism](#), and refers to the extent to which people are expected to stand up for themselves, or alternatively act predominantly as a member of the group or organisation. Latin American cultures rank the lowest in this category, while the [USA](#) is the most individualistic culture.
  - [masculinity vs. femininity](#) - refers to the value placed on traditionally male or female values. Masculine cultures value competitiveness, assertiveness, ambition, and the accumulation of wealth and material possessions, whereas feminine cultures place more value on relationships and quality of life. [Japan](#) is considered by Hofstede to be the most "masculine" culture, [Sweden](#) the most "feminine." The US and UK are moderately masculine.
  - [uncertainty avoidance](#) - reflects the extent to which a society attempts to cope with anxiety by minimizing uncertainty. Cultures that scored high in uncertainty avoidance prefer rules (e.g. about

religion and food) and structured circumstances, and employees tend to remain longer with their present employer. [Mediterranean](#) cultures and [Japan](#) rank the highest in this category.

- [long vs. short term orientation](#) - describes a society's "time horizon," or the importance attached to the future versus the past and present. In long term oriented societies, thrift and perseverance are valued more; in short term oriented societies, respect for tradition and reciprocation of gifts and favours are valued more. Eastern nations tend to score especially high here, with Western nations scoring low and the less developed nations very low; [China](#) scored highest and [Pakistan](#) lowest [Institute for Training in Intercultural Management, 1993].

### Description of the situation

The questionnaire developed by Dutch Institute for Training in Intercultural Management was used to do the research on organisational culture in Latvia. The respondents had to answer questions divided into 5 groups. Each group reflects one of the cultural dimensions.

### Results

The questionnaire encompassed totally 1894 residents of Latvia, of which 986 were females and 908 males falling in the age group between 20 and 58 years. Gender differences were not studied separately due to the limited scope of the research.

The study focused on the differences by the place of respondents' residence, displaying 5 regions.

Table 1

Region	Number
Kurzeme	312
Vidzeme	486
Zemgale	386
Latgale	402
Riga	308

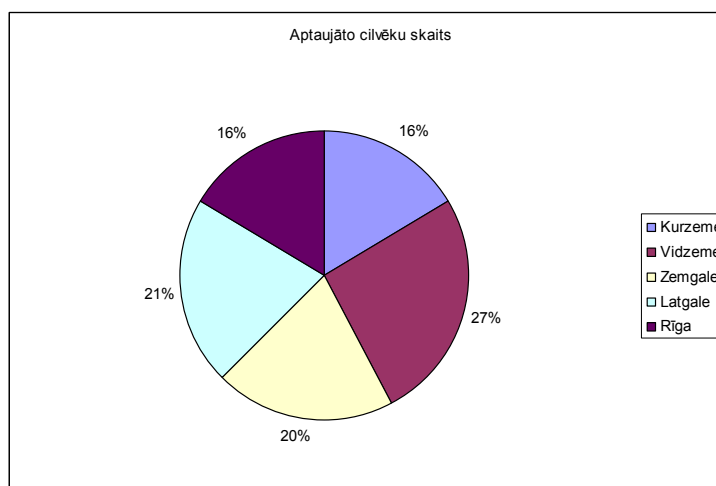


Fig. 1. The breakdown of respondents by regions

The comparison of the obtained valuations by the regions of residence shows that they are quite similar. The largest ranges of valuation are seen in the valuations of Individualism (IDV) and Uncertainty Avoidance (UAI). It may lead to the conclusion that similar attitude of the population towards organisational culture is observed in the whole territory of Latvia (Table 2).

Residents were studied by nationalities: 1374 were Latvians and 463 were Russians. The rest 57 residents were the representatives of other nationalities, and thus, as being the case minority, not studied individually.

Table 2

**Valuation of 5 dimensions by the regions of residence**

<b>Regions</b>	<b>PDI</b>	<b>IDV</b>	<b>MAS</b>	<b>UAI</b>	<b>DCI</b>
Kurzeme	31	46	26	30	22
Vidzeme	30	47	28	36	26
Zemgale	33	46	31	41	24
Latgale	31	41	27	33	25
Riga	30	38	30	37	28
<b>Latvia</b>	31	44	30	36	25

The comparison of the valuation of 5 dimensions by the Latvians and Russians shows no substantial difference. Masculinity (MAS) and Uncertainty Avoidance (UAI) (Table 3) are a little more important for Latvians. The author considers the fact that the representatives of the two nationalities live in the same country explain the similar results.

Table 3

**Valuation of 5 dimensions by nationalities**

<b>Nationality</b>	<b>PDI</b>	<b>IDV</b>	<b>MAS</b>	<b>UAI</b>	<b>CDI</b>
Latvians	31	42	30	38	25
Russians	33	46	24	32	21

The comparison of the obtained five-dimensional valuations of the residents of Latvia with the results obtained by Dutch Institute for Training in Intercultural Management on the Baltic States shows that there is no substantial difference in the valuations; thus proving similar mentality among the population of the Baltic States. The comparison of the valuations on Latvia with other countries may lead to the conclusion that the cultural valuations differ. Diverse cultural perception and attitude towards it expressed by the world nations may serve as the explanation for varied valuations (Table 4).

Latvia is a small Power Distance (PDI = 31) country, similar to Sweden and the United States of America. Individualism is weakly explicit in Latvia (IDV = 44), similar to the Eastern mentality – Russia and Ukraine. Masculinity (MAS = 30) valuation is also low, as in Sweden and other Baltic States.

Uncertainty Avoidance (UAI = 36) is weakly expressed in Latvia, similar situation is observed also in Sweden and the United States of America. Confucian Dynamism (CDI = 25) was valued only in some countries, Latvia falls under the category of weak Confucian Dynamism, similar to Sweden and the United States of America (Table 4).

Table 4

**Valuation of 5 dimensions by countries**

Country	PDI	IDV	MAS	UAI	CDI
Austria	11	55	79	70	
Baltic States	40	60	30	50	
Belgium	65	75	54	94	
Canada	39	80	52	48	23
China	80	20	66	30	88
Czech Republic	57	58	57	74	13
Denmark	18	74	16	23	
Finland	33	63	26	59	
France	68	71	43	86	
Germany	35	67	66	65	31
Hungary	46	80	88	82	50
Ireland	28	70	68	35	
Japan	54	46	95	92	80
Netherlands	38	80	14	53	44
Norway	31	69	8	50	20
Poland	68	60	64	93	32
Russia	93	39	36	95	
Slovakia	104	52	110	51	38
Spain	57	51	42	42	86
Sweden	31	71	5	29	33
United Kingdom	35	89	66	35	25
United States	40	91	62	46	29
Latvia*	31	44	30	36	25

\*the research done by the author

[ 3 ]

## Conclusions

The comparison of the valuation of 5 dimensions by the Latvians and Russians shows no substantial difference. Masculinity (MAS) and Uncertainty Avoidance (UAI) are a little more important for Latvians. The author explains the similar results by the fact that the representatives of both nationalities live in the same country. At the University Russian students study in Latvian groups and have integrated themselves in Latvian society.

The obtained results by regions are quite similar. The largest ranges of valuation are seen in the valuations of Individualism (IDV) and Uncertainty Avoidance (UAI). The author concludes that similar attitude of the population towards organisational culture is observed in the whole territory of Latvia.

The comparison of the obtained five-dimensional valuations of the residents of Latvia with the results obtained by Dutch Institute for Training in Intercultural Management on the Baltic States shows that there is no substantial difference in the valuations; thus proving similar mentality among the population of the Baltic States.

Latvia is a small Power Distance (PDI = 31) country, similar to Sweden and the United States of America, which means that the hierarchy exists for the convenience, and all members of the society have equal rights. Individualism is weakly explicit in Latvia (IDV = 44), which speaks on the expression of collectivism that is closer to the Eastern mentality – Russia, Ukraine, and India. Masculinity (MAS = 30) valuation is also low, as in Sweden and other Baltic States, which denotes towards the feminine society – care for the incapable part of the society. Uncertainty Avoidance (UAI = 36) is weakly expressed in Latvia, which shows the desire to risk and hide emotions; similar situation is observed also in Sweden, India, and the

United States of America. Confucian Dynamism (CDI = 25) was valued only in some countries, Latvia falls under the category of weak Confucian Dynamism, similar to Sweden and the United States of America, which speaks on short-term orientation and expectations of quick results.

### **References**

1. Institute for Training in Intercultural Management, 1993.
2. Reņģe V. Organizāciju psiholoģija (Organisational Psychology). R: Kamene, 2004
3. 2nd, revised edition 2005, with Gert Jan Hofstede
4. Stephen P. Robbins, Mary Coulter. Management. Prentice Hall, Upper Saddle River, New Jersey 07458
5. The 5-D Model. Institute for Training in Intercultural Management, 1993

## Land Market in Zemgale Region

Uldis Ivans, associate professor, PhD student, Latvia University of Agriculture

### Abstract

The research object is land market in Zemgale region. The object of the study is to find out economic and legal aspects of the land market in Zemgale region.

The author has advanced the following tasks to achieve the set aim: to view theoretical and legal aspects of the land market; to explore and analyse qualitative and quantitative indicators characterising the land market of Zemgale region; to analyse and evaluate different factors influencing land market in Zemgale region.

The study covers the analysis on the land market in Zemgale region and factors influencing the land market, land price and development tendencies of the land market for the period between 2001 and 2005.

**Key words:** land market, landed properties, sold land areas, price of land

### Introduction

In Latvia similar to other market economy countries, the land market is the governing type of investment. Since Latvia's accession to the European Union, Latvia has become an attractive country both to foreign and local investors, especially in relation to the land market. In long-term the price of land increases worldwide, since land resources are limited, while in short-term the price of land fluctuates according to the state economic situation and various subjective factors. For instance, in 2005-2006 the price of land plots for individual building in Zemgale region has grown more than 2.6 times. Likewise the land market activity has grown.

Different opinions on Zemgale and Zemgale region exist. The author for the purpose of his research considers Zemgale planning region comprising the districts of Aizkraukle, Bauska, Dobele, Jelgava and Jēkabpils, and Jelgava city, as Zemgale region. Only transactions with the agricultural land are examined due to the limited scope of the study.

**The aim of the research** is to study economic and legal aspects of the land market in Zemgale region. The author has advanced the following tasks to achieve the set aim: to view theoretical and legal aspects of the land market, and to explore and analyse qualitative and quantitative indicators characterising the land market of Zemgale region.

### Materials and methods

The following **research methods** have been applied to achieve the set aim and fulfil the advanced tasks: monographic or descriptive method, methods of analysis and synthesis, as well as statistic study methods.

The **research object** is land market in Zemgale region. The study covers the analysis on the land market in Zemgale region and factors influencing the land market for the period between 2001 and 2005. The analysis is done based only on the data of the purchase contracts, since the purchase sums are not disclosed in other types of transactions. The research is based on the data of the State Land Service of the Republic of Latvia, Central Statistical Bureau, Land Registers, Bank of Latvia, data provided by the real estate companies "Garro" Ltd, "Mītava" Ltd and "Latio" Ltd, the information on the transactions with land in Latvia and Zemgale region, as well as the data of questionnaire done by the author. Scientific literature, legal and regulatory enactments of the Republic of Latvia, and different periodicals – articles from several newspapers and magazines- were used to analyse and study theoretical and legal aspects of the land market, as well as the factors influencing it.

### Results

#### Description of the situation

The aspects of real estate market shall be analysed due to the role of real estate in property rights, their acquisition and termination, as the market situation forms the basis for legal transactions with real estate.

It shall be noted for clear understanding of these issues that series of peculiarities characterise the real estate market, which either promote or hinder the progress of these transactions. The peculiarities are as follows:

- 1) any piece of real estate offered in the market is unique in some way. Thus not always both parties of the transaction (buyer- seller) have precise information on real estate price governing in particular transactions;
- 2) pretty often legal transactions related to the real estate may be market confidential. Hence the information the parties exchange may be wrong or imprecise that can cause inadequate and sudden fluctuations in market prices;
- 3) market is relatively localised, therefore local factors that may affect the market are significant;
- 4) presently in Latvia the demand for UAA real estates is not high, and mainly it relates to the low purchasing power (Dobele A., 2002).

According to the information provided by the State Land Service Table 1 presents the structure of land by the type of land use in the Republic of Latvia on January 1, 2007.

Table 1

**The structure of land in Latvia by the type of land use on January 1, 2007**

Type of land use	ha	%
UAA	2448433.0	38.0
Woods	2929017.4	45.4
Brushwoods	115201.7	1.8
Swamps	252182.2	3.9
Under water	233884.0	3.6
Yards	92786.1	1.4
Roads	134760.9	2.1
Other land areas	245191.2	3.8
Total in the country	6451456.5	100.0

Source: Information of the State Land Service Headquarters

The utilised agricultural area (UAA) covers 2474.4 thousand ha or 38.0% of the total territory of Latvia, of which 1832.2 thousand ha fall under the category of arable land. The rest of land comprises orchards of 29.1 thousand ha, meadows – 231.1 thousand ha and pasture land – 382.0 ha. Yet part of the UAA is not used, as according to the data of land supervision provided by the State Land Service currently 503.1 thousand ha or 21.2% of the UAA, of which 245.5 thousand ha or 16.3% is ameliorated land is not used.

The zoning of land by groups of purpose of real estate use is variable and constantly under precision, since the respective government institutions and municipalities determine and alter the target (targets) of real estate use in compliance with the targets of real estate use stated in the territory layouts in force or legally initiated targets.

In Latvia the analysis of real estate market shows that some sections of real estate market, for example, the market of utilised agricultural area, are not yet sufficiently developed. Their market share is small, approximately 3-5% of the total real estate market. In the coming years essential changes are expected in the development of land market due to Latvia's accession to the EU, as levelling of all prices is taking place in the EU common economic area.

Table 2 presents the data on the structure of land by groups of purpose of real estate use in Zemgale region on January 1, 2007.

In Zemgale region the properties or usages for the construction of “one family” and “two families” dwellings cover the largest part, i.e., 49431 or 49.1% of the total number of land properties or usages. Properties or usages with the purpose of agriculture also cover considerable proportion in Zemgale region, i.e., 45985 amounting to 45.7% of the total number of properties or usages.

Table 2

**The number of land properties and land users by groups of purpose of real estate use in Zemgale region on January 1, 2007**

Group of purpose of real estate use	Properties or usages	
	Number	%
Agriculture	45985	45.7
Construction for "one family" and "two families" dwellings	49431	49.19
Areas of multi-family apartment buildings	1868	1.9
Objects for traffic infrastructure	1136	1.1
Objects for public use	616	0.6
Forestry	432	0.4
Industrial objects	388	0.4
Land for commercial institutions and use	308	0.3
Land for public utilities and other service networks	244	0.2
Water management	148	0.1
Land for mining industry and exploitation of pits	68	0.1
Other objects	12	0.01
Total	100636	100.0

Source: Calculations done by the author according to the information of Zemgale Regional Institution, the State Land Service

Land for mining industry and exploitation of pits is not well developed in Zemgale region, thus it covers only 0.01% (68 usages or properties) of the total number of properties or usages.

Table 3

**Areas of sold land by groups of purpose of real estate use in Zemgale region in 2006**

Indicators	Individual construction	Construction of industrial objects	Commercial use	Utilised agricultural area	Land used for forestry	Other
Total area, ha	370.51	7.57	3.98	21921.12	80.88	3.04
Number of transactions	3641	121	142	2284	10	234
Area per one transaction, ha	0.1017	0.0583	0.0282	9.60	8.08	0.01

Source: Calculations done by the author according to the data of the State Land Service

The calculations included into Table 3 show that the average area per one transaction for individual construction is 1017 m<sup>2</sup>, construction of industrial objects - 583 m<sup>2</sup>, while only 282 m<sup>2</sup> for commercial use.

The utilised agricultural areas cover the largest proportion in transactions with land in Zemgale region - 9.60 ha, while the average area per one transaction for the land used for forestry is 8.08 ha. However it shall be noted that there have been only several transactions with land used for forestry.

According to the information provided by the State Land Service both legal and natural entities purchase agricultural land. It shall be emphasised that real estate market prices differ for legal and natural entities. Legal entities mainly relate transactions with land to the future, since the land is purchased for agricultural production with a target to cultivate it and earn profit in the future. The analysis of information shows that the land transactions of legal entities have higher prices. The analysis presents that usually legal entities show the real sum of transactions, while natural entities declare smaller sum in the purchase and sales contracts.

Practically there are no advertisements on sales of agricultural lands, as offers are directly expressed among farmers, municipalities or acquaintances.

Mainly transactions with agricultural land and transactions with areas for construction prevail in the land market.



Utilised agricultural areas in 90% of cases are purchased (bought in addition) for the development of agriculture – expansion of production. Small amount of areas (agricultural, yet barren land areas) are purchased additionally to woodlands.

Table 4 gives the survey on the data published in the data base of the State Land Service on average prices declared in the purchase contracts per 1 ha in transactions with the UAA, and they are compared with the average offer prices.

Table 4

**Prices declared in the purchase contracts, average real (found out) offer prices and cadastral value by districts of Zemgale region in 2006**

District	Prices declared in purchase contracts, LVL/ha	Average real (found out) offer prices, LVL/ha	Average adjusted evaluation of UAA, LVL/ha
Aizkraukle	380	525	121.6
Bauska	665	894	191.2
Dobele	830	1160	201.3
Jelgava	990	960	216.4
Jēkabpils	565	663	130.6

Source: Calculations done by the author according to the data of the State Land Service and [3;4;5]

Is it obvious that the price of utilised agricultural area is bound to the average adjusted evaluation of UAA. Therefore the land price in districts of Dobele and Jelgava is considerably higher than in Aizkraukle district.

The market research analysts of the State Land Service summarise the average real (found out) offer prices on the basis of information gathered from the owners of real estate. The author's questionnaires also prove the average real prices. Within the recent five years in Zemgale region not only the number of these transactions has grown tremendously, but also the sums of transactions have increased more than three times, but the most important fact both for lawmakers and the society is that the number of violation of rights related to the transactions with real estate has essentially increased, and in particular reduced sums of transactions are shown in official documents.

Table 5 shows the average prices of UAA and the average growth rates in Zemgale region for the period between 2001 and 2006.

According to Table 5 the prices of UAA have increased in all districts of Zemgale region, though the growth rates differ by districts. During the period analysed the prices have increased very sharply in districts of Jelgava and Jēkabpils by 29.12% and 23.06% respectively.

The smallest increase was observed in Aizkraukle district – by 13.4%. The price dynamics in Jelgava district is related to the willingness to develop production close to Riga, while in 2001 the price of UAA in Jēkabpils district has been very low – only 245 LVL/ha, thus the prices for UAA are being levelled.

Table 5

**The average prices of UAA and the average growth rate by districts of Zemgale region between 2001 and 2006, LVL/ha**

Districts	2001	2002	2003	2004	2005	2006	Average growth, %
Aizkraukle	335	270	305	335	301	380	13.40
Bauska	480	-	465	450	553	665	13.85
Dobele	470	485	475	575	784	830	17.66
Jelgava	340	-	370	560	960	990	29.12
Jēkabpils	245	230	380	330	500	565	23.06

Source: Calculations done by the author according to the data of the State Land Service and [3;4;5]

### Conclusions

1. The value of real estate is determined not only by the character size, but also by different factors that are beyond the object under evaluation, and both directly and indirectly either increase or decrease the property value. They are social, economic, legal and physical factors.
2. The level of economic development and place of location of a district explain the considerable difference in land prices by districts of Latvia. During the period analysed the highest land prices were observed in Dobele district - 1160 LVL/ha and Jelgava district- 960 LVL/ha. The lowest land prices are in Aizkraukle district – 525 LVL/ha and Jēkabpils district - 563 LVL/ha, since the economic level of these districts is low.
3. In Zemgale region land transactions for individual construction comprise the largest number of transactions in 2006 in the countryside amounting to 3641 cases and 2284 cases with the UAA.
4. The average sums declared in the purchase-sales contracts substantially differ from the real (found out) prices, in some cases even 5.6 times.
5. Between 2001 and 2006 the prices of UAA have grown in all districts of Zemgale region, the most rapid increase is observed in Jelgava district – 2.91 times. The fact that UAA is a limited resource and the land prices of Latvia after joining the EU and application of the Common Agricultural Policy (CAP) are levelled with the market prices of the EU member states determine the rapid increase in land prices.
6. At present transactions with land properties are among the most popular transactions in civil relations. Within the recent five years in Zemgale region not only the number of these transactions has grown tremendously, but also the sums of transactions have increased more than three times, but the most important fact both for lawmakers and the society is that the number of violation of rights related to the transactions with real estate has essentially increased.

### References

1. Dobele, A (2002) Zemes izmantošanas iespējas lauku daudzfunkcionālā attīstības apstākļos (Possibilities for Use of Land under Multifunctional Rural Development) // Proceedings of International Scientific Conference, Jelgava, 106.-144. pp.
2. <http://www.vzd.gov.lv/print.php?s=7&sub=253>
3. Unpublished information of the real estate company "Garrdo" Ltd
4. Unpublished information of the real estate company "Latio" Ltd
5. Unpublished information of the real estate company "Mītava" Ltd
6. Unpublished information of Zemgale Regional Institution, the State Land Service
7. [www.vzd.gov.lv/index.php?s=7&sub=110](http://www.vzd.gov.lv/index.php?s=7&sub=110)

## Recently Implemented Inflation Combating Measures and their Impact on Rural Development in Latvia

**Kristīne Jarve**, lecturer, Mg. oec., PhD student

Faculty of Engineering Economics, Riga Technical University

**Ineta Geipele**, Prof. Dr.oec.,

Faculty of Engineering Economics, Riga Technical University

### Abstract

This article analyses the recent changes in the Law “On Personal Income Tax”, which were implemented as one of the measures of reducing inflation in Latvia. These changes affect real estate industry in general and sale of agricultural land in particular. Up to now rural development of Latvia was weakened by rapidly rising real estate prices and willingness to make an easy profit by transforming agricultural land in Latvia into building land and selling it off for building private houses. Previously, Latvian taxation system was promoting such activities as these profits were not subject to personal income tax, assuming that sellers kept these properties in their possession for at least one year before the sales transaction took place. Recent changes in tax legislation partly solve this problem and are aimed at making sure that agricultural land is sold to farmers, who intend to use it for agricultural purpose. However, as the problem is solved only partly, the authors have done a research to determine what type of changes in the tax legislation are required to ensure that taxation is applied in similar way to different types of capital gains, and imperfections in tax laws are not used to avoid paying tax altogether. In order to reach this aim the authors have compiled and analysed information about taxation systems in other European countries, and how capital gains are subjected to taxation there. As a result of this research the authors provide several suggestions as to how capital gains could be taxed in Latvia, potential range of tax rates to be applied and exemptions to be provided in tax legislation.

**Key Words:** Rural development, capital gains, tax, sale of real estate, sale of shares

### Introduction

For years now rural development in Latvia has been affected by raising land prices and willingness of some individuals to transform agricultural land into building land, thereby obtaining maximum profit from the sales of such land. Tax legislation in the past did little to restrict such transactions and even made this into one of the most profitable businesses as no tax was due on such property sales, assuming the seller had kept this property in his possession for at least a year before sales. This in turn meant that more and more of agricultural land was purchased not with an intention to operate a farm or agricultural production facility but rather to hold this land for obtaining a non-taxable capital gain in the future as the price of the land rose. This took more and more of the agricultural land out of the hands of farmers and put it into the hands of people speculating in real estate field. Therefore, this resulted in reduction of agricultural activity in Latvia.

Recently Latvian government in the interests of combating increasing inflation has introduced changes in tax legislation which among other things extended the application of the Law “On Personal Income Tax” in regard to real estate sales as well as specifically introduced certain incentives for sellers if agricultural land would be sold to farmers rather than any other persons. This is a first step into direction of taxation of capital gains as well as promotion of rural development in Latvia.

Nevertheless, there still are other improvements of taxation system which are needed in order to ensure that tax on capital gains is paid equally regardless of the type of capital gain, and there are no possibilities for individuals to avoid paying tax by introducing various schemes and structuring their investments in the way, which uses imperfections of tax laws for their benefit.

The aim of this article is to review recent changes in tax legislation, to evaluate the effectiveness of these measures, and to propose potential improvements in the tax system, which could lead to more equal

taxation of different types of capital gains, and ensure that tax payments are not avoided by using imperfections of tax laws. This aim will be achieved by reviewing taxation systems of other European countries, comparing the way capital gains are subjected to taxation there and drawing conclusions as to what further changes are required in Latvian tax laws to ensure the most suitable result. The review will be done by compiling information on capital gains taxes in other European countries, specifics of application of such taxes, tax rates and exemptions. After this would be done, the author will present suggestions as to what can be potentially changed in Latvian tax legislation to promote rural development and obtain maximum result from the taxation of capital gains.

### **Concept of capital gains tax**

Before the authors go deeper into specifics of capital gains taxation in Latvia, it is necessary to discuss the concept of capital gains and their taxation. To define capital gains tax, it should be considered what the notion 'capital' means and what capital gains are or, in other words, what the tax base is formed of and how it is taxed. Capital is the driver of economic growth. Capital comprises not only financial assets, such as cash invested in stocks, but also physical investments like industrial equipment, computers, and other non-labour means of production which enable the company to operate effectively. Capital may be attributable also to technological improvements, even ideas, which may lead to the set-up of a new business or product. Capital also enhances the growth of income for employees as working with a larger capital results in the increased productivity and real wages (Cato.org, 1995). Capital gains are the increase in the value of a capital asset (investment or real estate) that brings the value higher than the original cost of acquiring the asset. Capital gains are realised as soon as the asset is sold (Investopedia.com, 2007). Therefore, it is necessary to assess whether such kind of gains should be taxable in Latvia, and whether the state will derive additional income after the introduction of this tax compared to administrative expenses which would arise due to the necessity to control tax calculation and payment.

However capital taxation might bring about certain problems. First, the impact of inflation on capital gains should be taken into consideration, as capital gains may grow also in the result of being influenced by inflation. In this case both real gains and inflation (monetary) gains are subject to tax. Therefore the amount of money paid upon the acquisition of the asset cannot be objectively compared to that obtained in the result of its sale. It should be noted that inflation enhances more rapid growth of nominal asset gains than that of nominal wage gains. As a result, the equal growth of nominal gains derived from both of the above sources reflects the unequal growth of real purchasing power and hence the equal tax burden causes unequal treatment. The tax base grows, as the expected inflation produces a twofold impact on capital gains: both the asset value and the asset gain rate are increased. To define taxable capital gains, the taxpayer would have to increase the acquisition price by the accrued inflation factor prior to it being deducted from the present value. Due to inflation, also fixed-income securities are losing their value in real terms each year, and the original amount of investments might also diminish (Harvey S. Rosen, 2002). This problem is particularly burning in Latvia, as currently inflation is running rather high which means that, prior to imposing capital gains tax, it should be carefully considered how the inflation factor will be taken into account to prevent a situation, where not only real gains but also inflation gains are taxed.

The given inflation adjustments are true only where inflation is always fully foreseeable and all gains, being affected by inflation, grow at the same pace. In reality, neither of these conditions is met. Therefore, upon making adjustments, it would be more practicable for the governments to use real inflation rates rather than expected rates. The economic research still has not defined how expected inflation is formed. Regardless of the above, nominal interest rates and capital values almost definitely adapt to the expected inflation, partly at least. Therefore it would be more appropriate to peg capital gains to a long time mean inflation index rather than make any adjustments at all. Those who fail to forecast inflation correctly might face unexpected profits or losses compared to the theoretical model, but it could be hardly avoided. Practical is the question about what long time series should be used, as assets and other sources of income have different rates of inflation. In fact, the consumer price index could be relevant, although it is not a perfect solution here (Arnold C. Harberger, Martin I. Bailey, 1969).

Second, it would be necessary to assess what should be subjected to capital gains tax: total accrued capital gains or only realised capital gains. If capital gains would be taxed as soon as they arise (not realised), there might emerge certain difficulties in determining the amount of the capital increase. There are assets for which the increase in the value is hard to determine, since they are not traded regularly and actively. This

applies for instance, to antiquities, paintings, and real estate. In addition, capital gains may be derived irregularly, which renders the tax administration process even more complicated. In practice, realised capital gains are taxed, but the procedure for taxation of realised capital gains has several deficiencies. In this case, capital gains tax is deferred until capital gains are realised. This possibility of deferring taxes may seem insignificant, however consequences may be rather serious, as in fact the private individual obtains a perpetual interest-free loan from the state, and only tax is paid after capital gains have been finally realised.

As the comparison of tax payable after the realisation of capital gains and tax payable also on unrealised capital gains over a certain time period shows, the post-tax capital gains are larger where realised capital gains are used as the tax basis. The reason for such difference is that deferment of tax payment permits the investment to grow in geometric progression based on the pre-tax rather than post-tax rate. Since only realised capital gains are subject to tax, taxpayers intending to hold or sell assets should take into consideration that tax shall be payable upon the sale of assets, and for this reason taxpayers might prefer to keep to the same kinds of investments (Harvey S. Rosen, 2002).

The introduction of capital gains tax or the reduction of tax rates is rather a controversial issue, as the tax has both positive and negative aspects. In their essence, capital gains are income and therefore would be subject to tax in the same manner as salaries. In addition, as the data evidence, income is basically concentrated in the hands of high-income taxpayers. More than half of the aggregate capital gains is realised by the best-off 1% of taxpayers, and they are those benefiting from the low tax rates or the absence of capital gains tax (Slemrod J, 1996). It is unfair from the social viewpoint. In the absence of capital gains tax, taxpayers are tempted into using existing possibilities of transforming their income into capital gains, and this is the reason for aggressive tax planning and the state budget losing potential tax revenue. Moreover, only the wealthiest part of the community can enjoy this possibility. Capital gains tax reduces investment in non-productive assets, like antiquities, coins, paintings, or stamp collections acquired for generating a profit from the increase in the value, while in fact bringing no added value (James S., Nobes Ch, 1997).

It should be admitted however that the introduction of capital gains tax might hinder capital formation and restrict investing, which would entail hampering of further business development, productivity growth, economic development, and reaching higher living standards, while prudent taxation of capital gains would stimulate capital accumulation and risk taking. Furthermore, capital gains tax applied only to realised gains causes economic failure. Capital is frozen and prevented from flowing to more profitable investments. The data show that accrued capital gains on more than half of stocks are not realised for several years in order to defer tax payments. Both well-off and moderately well-off taxpayers put certain limits on realisation of their capital gains. Thus revenue the state derives from capital tax is rather small (Arnold C. Harberger, Martin I. Bailey, 1969).

The administration of capital gains tax collection is rather complicated for reason of the aforementioned tax application problems. Hence the imposition of capital gains tax might require substantial tax administration costs. It is believed that it would be fair not to tax capital gains since these are irregular and may arise unexpectedly. In addition, investing means refraining from consumption, which may be compensated by non-taxation of capital gains. This reason is, however, not strong enough since the opponents of this opinion might claim that the treatment of labour income might be less strict in the same way since this kind of income includes unpleasant work conditions or dislike of work, while after investing all we have to do is waiting for money to come. Therefore it cannot be stated with absolute certainty which of the sources of income (labour income or income from capital investments) would be more appropriate to tax (Harvey S. Rosen, 2002).

### **Taxation of capital gains from sale of real estate in other European countries**

For the purpose of understanding how Latvia compares to other European countries in respect to taxation of capital gains, the authors have compiled the information on tax rates applicable as well as preconditions for taxation of capital gains in other European countries. The information below is largely reflecting data for the year 2007, however, in some cases tax rates are from the year 2006, and this is marked in the information below.

Table 1

**Personal income tax rates prevailing in the EU member states which apply personal income tax to gains on the sale of real estate**

Country	Personal income tax		
	Intervals	Minimal rate	Maximal rate
Germany	10	15	45 (income exceeding EUR 250 000)
Italy	5	23	43
Great Britain	-	10	40
Belgium	5	25	50
Austria	10	(Income - €10,000x5,750)/ 15 000	Income - €51,000x0,5 + €17,085
Denmark	-	0	59
Czech Republic	5	12	32
Slovakia	-	19	19
Lithuania	3	15	15
Estonia	-	22	22
Slovenia	10	16	41
Malta	-	0	35
Romania	-	16	16
Bulgaria	-	0	24

Source: EY The Global Executive, 2007 data and the review of taxation systems of various countries

It can be concluded that in the old Member States (Germany, Italy, Great Britain, Belgium, Austria, and Denmark), capital gains on the sale of real estate are not liable to personal income tax provided that such real estate has been used as a primary residence. Most laws and regulations of the Member States provide for a minimal term during which the individual has to live in the home as his/her primary residence to avoid paying personal income tax. In Germany and Austria this period is two years, while in Italy it is five years. Furthermore, it is possible not to pay personal income tax on gains on the sale of real estate also, where the estate has not been the primary residence, but has been owned by one person for a continuous period of time. For instance, in Germany and Austria the aforementioned period is at least ten years (in Austria it may be also fifteen years in specific cases), while in Belgium the period is fixed separately for land (which must be owned by one person for more than eight years) and developed real estate (buildings and constructions must be held by one owner for more than five years). In the new EU member states listed in the table above (Slovakia, Lithuania, Estonia, Slovenia, and Malta) the primary residence requirement is not envisaged as a pre-condition for gains on the sale of real estate not to be subject to personal income tax, the key pre-condition being the duration of the ownership of real estate by one person. In the Czech Republic capital gains on the sale of real estate are not liable to personal income tax if real estate has been owned by one person for more than two years (as primary residence, otherwise – 5 years), while in Slovenia this period is considerably longer: ten years. In Lithuania capital gains not exceeding EUR 2,224 are not subject to personal income tax, while in Estonia no personal income tax is applied, where the estate or apartment house is privatised, returned, or inherited. In the Netherlands this kind of capital gains is exempt from personal income tax, while in Greece the tax rate depends on the time period of ownership – the longer period of time the real estate is held, the lower taxes are paid from the gain. In Bulgaria, one of the latest new Member States, gains from sale of real estate are non taxable for tax residents of EU/EEA, but gains derived from the

sale of two properties are non-taxable, if held for more than 5 years. In Romania gains derived from the sale of real estate are taxed at the rate of 16%.

Other Member States have chosen to apply to gains on the sale of real estate different income tax rates from those fixed for other kinds of income. The Member States in which gains from the sale of real estate are taxed at a rate different from the personal income tax rate are summarised in the table below (EY The Global Executive, 2007).

Table 2

**Tax rates applied to capital gains on the sale of real estate in the Member States**

Country	Tax rate applied to income derived from real estate	Personal income tax		
		Income intervals	Minimal rate	Maximal rate
France	27	-	0	40*
Spain	18	2	0	43
Portugal	50% of gain	2	10,5	42
Sweden	20 or 30	There are state taxes (20–25%) and municipal taxes (29–37%) applied separately		
Finland	28	2	0	32
Ireland	20	-	20	41
Poland	19	5	19	40
Hungary	25	-	18	36
Cyprus	20	-	0	30

Source: EY The Global Executive, 2007 data and the review of taxation systems of various countries

\* Tax rates for the year 2006

In France, Finland and Ireland capital gains on the sale of a primary residence are free from personal income tax; while in Finland the estate must have been the primary residence for at least two years prior to the sale. In France the taxable base is decreased by 10% each year if the real estate is held by one owner for more than five years. In Poland gains on the sale of real estate owned by one person for more than five years are not subject to tax. In Portugal capital gains on the sale of a primary residence are free from tax if the income resulting from such sale is invested into the acquisition of a new house in Portugal during 24 months after the sale, or 12 months prior to the sale. In Sweden this kind of capital gains is subject to personal income tax at 20%, while the rate at 30% is applied to gains on the sale of real estate used in business. In Cyprus no tax is charged on capital gains on the sale of real estate in the amount not exceeding GBP 50,000 (in case of primary residence). The tax treatment adopted in Luxembourg is as follows. No tax is contemplated in the event of the sale of real estate, which has been used as the individual's primary residence. Where the real estate is sold during two years following acquisition, respective capital gains are subject to personal income tax at the rate ranging from 6.79% to 32.53%. Furthermore, in the event of the sale of real estate that has been held by one owner for at least two years, income is adjusted to the rate of inflation, the amount of EUR 50,000 being tax-exempt (subject to revision every ten years), while the balance is subject to tax at 19%. The tax-exempt amount may reach EUR 75,000 in the event that the real estate has been inherited from lineal relatives and used as a primary residence. The laws and regulations of Luxembourg provide for an additional possibility to defer taxes if income derived from the sale of real estate is invested in leased items in Luxembourg.

Thus capital gains on the sale of real estate are taxed in the Member States either at the personal income tax rate in the same manner as other kinds of personal income, or at a lower rate. In addition, the real estate holding periods from one year to ten years are fixed where no tax is applied. The potential impact of inflation is compensated by fixing a rate lower than the personal income tax rate and envisaging the holding period requirement. Non-taxation of gains on the sale of real estate held for a continuous period of time permits avoiding a rather complex procedure for defining the amount of capital increase. None of the Member States have chosen to tax accrued capital gains: only realised capital gains on the sale of real estate are subject to tax. The key reason might be simpler tax administration and control. In addition, it would be rather problematic to set up a system that would permit proper taxation of accrued capital gains, since the mechanism might be rather complicated and not accurate enough.

### **Recent changes in Latvian tax legislation**

Previously the legislation provided for exemption from personal income tax on sales proceeds from sale of real estate, which has been in the possession of the individual for longer than 12 months period. This meant that profits from real estate transactions were virtually tax free. At the beginning of May 2006 the Ministry of Finance suggested introducing capital gains tax on income from speculative real estate transactions to compensate the decrease in tax revenue after the projected tax reform. These suggestions were not accepted until the government took a stand regarding combating inflation and on 17 May, 2007 supported various changes in the law “On Personal Income Tax” and the law “On Corporate Income Tax”, which were published in “Latvijas Vēstnesis” on 29 May and came into force on 12 June, 2007. These changes among other also impact sale of stocks in companies which own real estate in Latvia. The law “On Personal Income Tax” has been amended and significant changes refer resident’s and non-resident’s income generated from real estate located in Latvia, which will further comprise income from disposal of shares/stocks or other investments in domestic or foreign capital companies or other persons (within the meaning of the Corporate Income Tax Law) provided that in the year of such disposal or in the previous year real estate located in Latvia represents or represented more than 50 per cent of such person’s assets, directly or indirectly (via investments in one or several other persons incorporated in Latvia or any other foreign country).

The amendments provide for the deletion of the clause which set forth that no tax would be charged on income from the sale of real estate, which had been owned by the person for more than 12 months. The Law is supplemented with a clause whereby no tax will be imposed on disposal of such real estate which has been owned by the payer for more than 60 months (from the date that the estate is registered with the Land Registry), and has been the declared place of residence of that person (other than the additional address) for at least twelve months prior to the signature of a respective agreement on disposal. Income from transactions aimed at disposing of the rights to acquire real estate will be also deemed to be income from real estate disposal.

The Law specifically prescribes the procedure for defining income from disposal of real estate used in business operations or reclassification of such estate to an item intended for personal needs. The Law is supplemented with a section laying down special provisions for defining income from disposal of agricultural companies and agricultural land. The Law establishes, that income of a person, that is chargeable for personal income tax purposes, includes also earning gained from the expropriation of a real estate. However, if a farmland is being expropriated, the following exclusions shall be applied. Income that is not charged by the personal income tax is the earning from the expropriation of a farmland only if the both below-mentioned points are met:

- 1) the person who obtains the property rights as a result of farmland expropriation is registered as a commercial enterprise or farm within the Register of Enterprise of the Republic of Latvia, or as a performer of economic activities registered within the State Revenue Service of the Republic of Latvia;
- 2) more than one half of the earnings, caused by the economic activities of the person mentioned at sub-point 1) in one of the three before-taxation periods, are gained from the agricultural activities, or that person as a young agriculturist receives support from the European Agricultural Guarantee and Guidance Fund.



This means that speculation with agricultural land may soon come to an end, and real farmers could be the ones being able to purchase agricultural land for a reasonable price. If current owners of such land will be willing to sell this land in future, they might be inclined to sell this land to farmers, which qualify according to the above two points rather than to anyone else as selling to farmers will allow the seller not to pay personal income tax of 25% from profits s/he obtains from this transaction. Therefore, a recent trend in the market when agricultural land was purchased with intention to transform it into building land and selling to persons interested in building private houses on this land could be reversed or at least slowed down. This in turn will lead to retaining and further development of rural areas in Latvia.

Nevertheless, more incentives are needed in order to protect rural areas and reduce speculation with agricultural land. Even though these changes in tax legislation should be welcomed as first step towards protecting rural areas of Latvia, this only partly solves the problem. There still exist ways around paying personal income tax even if agricultural land is sold to non-farmer. One of the options still remains purchasing this land by a legal entity, for example, limited liability company owned by an individual and later on selling this property directly from this company and paying 15% corporate income tax, or even more tax efficient way would be to sell the shares of this company rather than the property. Tax saving would only be obtained if this company would have other assets than real estate as well, and therefore would not fall under the definition of real estate company.

To ensure equal application of the law and reduce possibilities to avoid tax payments, capital gains from both sale of real estate and sale of shares of companies should be taxed in similar way. Therefore, as a next step the authors would suggest introducing personal income tax on sale of shares of all types of companies regardless of the industry these companies operate in or the assets they hold. This would ensure equal application of taxes for both capital gains from sale of real estate and capital gains from sale of shares. This would also reduce possibility to avoid payment of tax by structuring property holdings in different ways, therefore making levelled playing field for people involved in these transactions.

The authors would also suggest that together with extending the scope of taxable transactions, reduction of tax rate applicable to capital gains is considered as from the information compiled above on different tax rates used in other European countries for capital gains, it becomes clear that most countries do have a tax on capital gains, however, the tax rate is lower than the tax rate used for other income, for example salary income. Reduction of tax rate for these types of transactions could lead to increased budget revenues as currently the collection of tax from real estate transactions relies on individuals declaring the income from such transactions themselves and very limited audit possibilities of tax authorities. Reduction of tax rate might lead to more incentives for people to declare this income and pay the tax due, as hiding such income and potentially facing penalties for this later might not pay off anymore.

### **Conclusions**

From the analyses above it can be concluded that recently implemented changes in the tax legislation regarding real estate transactions will affect rural development in Latvia as it is likely that more and more of agricultural land which was purchased with an intention to realize future capital gains from resale of this land as building land, will in fact be sold to farmers as this could lead to seller being exempt from personal income tax. Therefore, more of currently not used agricultural land would once again become farmland used for this purpose. However, these changes only partly solve the problem and therefore, further improvements of Latvian taxation system are required.

One of the proposals would be to consider the application of equal taxation treatment for different types of capital gains, including the sale of shares of companies and not restricted to only shares of real estate companies as currently is stated in the law "On Personal Income Tax". Tax should apply regardless of the industry the company operates in or assets it holds.

Another suggestion would be to revisit the section in the law "On Personal Income Tax", which deals with exemptions, and reduce the possibility of tax planning by clearly defining that exemption from 25% personal income tax applies only to individuals' primary residence.

Reduced rates for capital gains could be considered as the current rate of 25% is quite high if compared to other European countries, which have tried to apply reduced tax rates to capital gains. Introduction of reduced tax rate for capital gains could potentially lead to increased tax revenues for the budget as more individuals could be inclined to declare such income rather than face future penalties if they are audited.

## References

1. ABC's of the Capital Gains Tax, 1995// In: Internet 06.12.2006.//<http://www.cato.org/pubs/pas/pa-242.html>.
2. In: Internet 02.01.2007.//<http://www.investopedia.com/terms/c/capitalgain.asp>
3. Harvey S. Rosen. Public Finance Sixt Edition// In: The McGraw- Hill Companies, Inc., 2002 – p. 336, 338, 342, 343.
4. Arnold C. Harberger, Martin I. Bailey. The Taxation of Income from Capital// In: The Brookings Institution, 1969 – p.38.
5. Slemrod J. Tax Progressivity and Income Inequality// In: Cambridge University Press, 1996 – p.300.
6. James S., Nobes Ch. The Economics of Taxation Principles, Policy and Practice, 1997/97 Edition// In: Prentice Hall Europe, 1997 – p.165,166.
7. EYGM Limited. The Global Executive, 2007 - p.1155.

## Kopsavilkums

Šajā rakstā tiek analizētas izmaiņas likumā „Par iedzīvotāju ienākuma nodokli”, kas tika ieviestas kā viens no veidiem inflācijas samazināšanai un būtiski ietekmē darījumus ar nekustamo īpašumu. Specifiska uzmanība tiek pievērsta izmaiņām minētajā likumā, kas skar lauksaimniecības vajadzībām izmantojamās zemes un priekšnoteikumus to pārdošanai. Līdz šim Latvijas lauksaimniecības sektora attīstību būtiski ietekmēja arvien pieaugošās nekustamā īpašuma cenas un privātpersonu vēlme spekulēt ar šiem īpašumiem. Arvien vairāk lauksaimniecības zemju tika pirktas nevis ar mērķi tās izmantot lauksaimniecības vajadzībām, bet gan ar mērķi tās transformēt par apbūvei paredzēto zemi, sadalīt nelielos gabalos un pārdot privātpersonām privātmāju būvniecībai, tādējādi gūstot peļņu. Iepriekš Latvijas nodokļu sistēma šādus darījumus neierobežoja un ļāva šāda veida darbībām kļūt par vienu no visienesīgākajiem peļņas gūšanas avotiem. Tādējādi arvien mazāks lauksaimniecības zemju apjoms tika izmantots to paredzētajam mērķim.

Nesenās izmaiņas likumā „Par iedzīvotāju ienākuma nodokli” daļēji cīnās ar šo problēmu un ir vērstas uz to, lai lauksaimniecības zemju īpašniekiem būtu izdevīgi tās pārdot tieši zemniekiem nevis citām personām. Taču problēma tiek risināta tikai daļēji un tādēļ autors ir veicis pētījumu ar mērķi nonākt pie secinājumiem par to kādas papildus izmaiņas Latvijas nodokļu sistēmā būtu nepieciešamas, lai novērstu spekulācijas un veicinātu lauksaimniecības attīstību.

Lai sasniegtu pētījuma mērķi, autors ir apkopojis un analizējis informāciju par citu Eiropas valstu pieredzi kapitāla ienākuma aplikšanā ar nodokļiem, nodokļu likmēm un izņēmumiem. Pētījuma rezultātā autors nāk klajā ar priekšlikumiem par iespējamām izmaiņām Latvijas normatīvajos aktos attiecībā uz kapitāla ienākumu aplikšanu ar nodokļiem, iespējamām nodokļu likmēm un izņēmumiem, kas nodrošinātu vienlīdzīgāku nodokļu piemērošanu dažādiem kapitāla ienākumu veidiem un novērstu uz nodokļu nemaksāšanu vērstu shēmu izveidi, izmantojot šobrīd spēkā esošo nodokļu likumu nepilnības.

## Development of the Pharmaceutical Network in Rural Regions of Latvia and Pharmaceutical Reimbursement

Mg.oec. Eva LIEPIŅA, Ph D student  
Faculty of Economics and Management, University of Latvia ,  
eliepina@e-apollo.lv

### Abstract

This article analyses the development of the pharmaceutical reimbursement system of the retail pricing of medicine in Latvia.

The topicality of the article lies in the pharmaceutical price as the main factor influencing the level of social welfare. It is especially important if the personal income and purchasing power of the population are low.

The main task of the research is to find out how the pharmaceutical network should be organized and managed in order to best meet the needs of customers in the future.

The research includes issues on the pharmaceutical distribution network in rural regions of Latvia, the cost of pharmaceuticals, the pharmaceutical reimbursement and price regulation.

The main task of the research is to review the pharmaceutical price regulation methods in Latvia, and to compare pharmaceutical pricing and reimbursement development with other European countries. The attention is paid on the needs for medicine for people with special diseases in rural regions of Latvia.

Frequent price instability of pharmaceuticals is noticed. Some demographical, economic and institutional factors in relation to the costs of medicine are discussed.

The article provides calculations and analysis of the reference price of the medicine in Latvia. In order to determine the wholesaler's price for the reimbursement drugs, the technique of correction ratio corresponding to the producers purchasing price of medicine is used in the study.

**Keyword:** *pharmaceutical network in rural regions of Latvia, pharmaceutical prices and price regulation, pharmaceutical reimbursement, social welfare in rural regions*

### Introduction

In the conditions of a rapidly evolving economic growth in the world and Latvia, the impact of medicine on human health is growing as well. In recent years, the average price increase of medicine has been so rapid that it falls among the factors influencing inflation and generating the need for larger financial resources to reimburse the acquisition of prescription drugs. In this aspect, the topical issue is how to facilitate funding for the purchase of medicine required by the low-income rural residents of Latvia.

There is a lot of talk about securing healthcare improvement in Latvia, and the necessity for developing the drugs reimbursement system in the country, but rarely does research appear that directly applies to the development of pharmaceutical activity in rural regions. As in any other member-state of the EU, the issue of increasing state finances for the reimbursed medicine is very essential. These opportunities are to a large extent a political choice, which needs to be made by the government as a whole.

Latvia, in comparison with Lithuania and Estonia, uses considerably less financial resources, which are unreasonably scarce with regard to healthcare indicators. In such a situation it would be important to increase the state financing for the reimbursed medicines.

### Hypothesis, Goal and Tasks

This research starts with the **hypothesis** that the average price increase for medicine negatively impacts the well-being of society and hence generates the need for increasing subsidies for the reimbursement of prescription drugs.

In order to facilitate the accessibility of medicine for low-income seniors, the state regulations in determining the costs of medicine in Latvia, and the improvement of the system to reimburse these costs are especially important.

Taking these facts into consideration, **the aim of the research** is to analyse the tendencies of pharmaceutical activity development in the rural regions of Latvia and the opportunities for improving healthcare.

To achieve the aim, the following **tasks** have been put forward:

- to clarify the operation principles of the existing pharmacies in Latvia;
- to analyse the methods of forming retail prices for medicine and the development of the system for reimbursed medicines in Latvia in comparison with the European Union member states;
- to evaluate opportunities of regulating pharmaceutical activity in Latvia, and to attempt facilitating the accessibility of medicine in rural regions.

### **Scientific novelty of the research**

The data obtained during the research characterize the healthcare situation in Latvia in comparison with the European Union member states, and provide new information for the evolution of the national economy and the public health sector.

An in-depth study of price formation for pharmaceutical products has been performed for the first time in Latvia. The economic assessment of healthcare in this state has also been provided for the first time.

### **Materials and Methods**

While investigating the subject, laws and regulations of the European Union and the Republic of Latvia, resolutions of the government directed towards promotion of the healthcare policy, periodicals and Internet resources containing information required for the research were used.

The methods of analysis and synthesis, processing and grouping of statistical data, as well as the estimates of experts were applied in the research.

**The object of the performed research** is pricing for pharmaceutical products in Latvia, focusing on improvement of the reimbursement system of prescription drugs.

## **Results**

### **1. Pharmaceutical distributions network and its characteristics in the rural areas of Latvia**

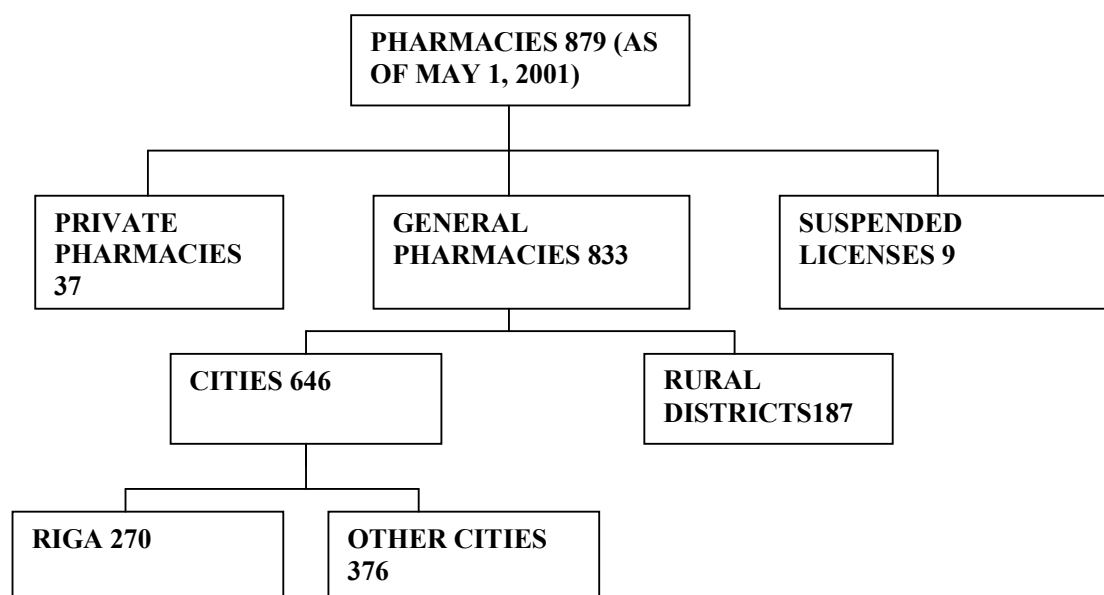
Out of 840 pharmacies licensed in Latvia, 149 are located in rural areas. Large pharmacies have opened 107 branches throughout these areas. Small country pharmacies must observe the same requirements in their operation as urban drugstores.

At present, pharmacies in the country can survive, but cannot earn much. Therefore, the regulations for country pharmacy maintenance need to be simplified. For instance, it must be determined whether or not a small pharmacy needs a computer with expensive software. Prescription drugs in rural areas are mostly bought by pensioners, who, with the current pension rates, have a low purchasing capacity. Thus, as is the opinion of the questioned pharmacists and owners of pharmacies [3], the country pharmacies will never operate on a large profit.

As of 1 May 2001, 879 pharmacies in Latvia were granted licences for opening and running pharmacies. Of these, 37 are the private pharmacies of patient care institutions, while 9 other pharmacies have had their operational licences suspended. 833 pharmacies are engaged in the retail sale of medicine and of these, 646 operate in cities and 187 in rural districts.

In order for a pharmacy to develop, a certain level of income is required. In the case of many pharmacies, they cannot secure the required income level to exceed their revenue; the only way out is to increase prices or to reduce expenses by limiting the amount of employees, training, or provided services. A smaller amount of pharmacies could ensure a sufficient amount of customers for each pharmacy, and increase the turnover and income to be directed for pharmacy development.

At present, with a limited amount of customers per each pharmacy, only some pharmacies have cost-effective maintenance. The ones having larger revenue can keep lower prices. Speaking of prices – the pharmacies' struggle with regard to pricing is unethical and fixing prices in pharmacies could be a good instrument in stopping this senseless price war.



**Figure 1. Model of latvian pharmacies**

To a certain extent we are on the way towards it: as the amount of drugs added to the list of reimbursed medicines increases, so does the amount of fixed prices.

## **2. Medicine Market Situation**

In Latvia, as in other places in Europe, an increase is observed in the number of senior citizens. In 2015, the number of residents over age 65 could reach 18% (Human Development Report, 2005). In Latvia, residents of this age group have lower income, whereas their need for healthcare services remains high.

The problem of ageing in Latvia is especially apparent in the backgrounds of other social problems. Therefore, the urgent issue is to facilitate financing to purchase the required medicines for low-income senior residents.

In Latvia, the consumption of prescription drugs is determined by the low income level of the residents. This means that, if the state share in securing these drugs is not increased, the health of the patients will not improve or will possibly deteriorate. In conformity with the Latvian drugs general market data, it can be concluded that, on average, a single Latvian resident spends USD 46-50 annually on drugs (correspondingly, in the European Union member states, an annual average of USD 200-300 or more is spent). In the developed member states, approximately 60-80% of expenses for medicine are covered by the state budget or compulsory health insurance funds, whereas in Latvia – the opposite is true – only a total of about 30% of the prescription drug market is medicine paid for by the state in hospitals and ambulatory care facilities (in the states of Eastern Europe - 50-80%)[2].

Some positive changes are observed in the national economy development in general. However, the situation of the part of society with the lowest income is becoming increasingly more complicated [4]. The results of investigating household budgets show that, on average, the household income per person in the state is gradually growing; however, income of the part of society with lower income is decreasing even more and the number of low-income residents, especially in the country, is growing considerably.

In Latvia, poverty has not yet been considered as a serious state problem; ignoring it significantly impacts the sustainable development of the state.

Although several Ministries are implementing programmes that facilitate a reduction of poverty and improve the situation of low-income residents in general (for instance, the support programme of small and medium-size businesses, the country development programme, the well-being and healthcare reforms and other events), their goals are actually more global – these programmes are mostly directed towards development of a stable, sustainable and cost-efficient system. However, with regard to the part of society with the lowest income, the efficiency of these programmes is very limited, as they often do not reach the residents with the lowest income and cannot provide them with significant support.

Expenses for prescription drugs increase from year to year (ageing of the society, new and more expensive drugs, curing diseases that have not been treated before), and as such, the cost efficiency measures appropriate for each state are significant. There are specific diseases in the country and a specific need for medicine, which is larger than their accessibility. Pharmacies are predominantly located in the cities, hence, with regard to the distance, local residents have less access to pharmaceutical products, and as a result, timely treatment of diseases does not take place and the amount of chronic diseases grows.

Development of the medical expenses has been attracting a large interest for many years. One reason is the rapid growth of medicinal expenses and spending state budget funds when making a list of reimbursed medicines and determining prices for drugs. The market of medicines is also a prerequisite for significant regulation and control of its social part. Its regulation comprises not only acceptance and control of medicines, but also such issues as distribution, expenses of medicines, sale, price formation and usage of medicines.

The market of medicines can be divided into three segments. These are production, wholesale and retail sale of medicines.

Price increases for medicine is linked to several objective factors: a new generation of medicines has appeared, the EU new, strict requirements for quality of medicines have been introduced and the stock of cheap drugs imported from the CIS states in 2004 has ended. The price growth for medicine cannot be stopped, but the expenses must be reimbursed by increasing state subsidies for medicine.

The price increase of prescription drugs can be partially explained by the introduction of the value added tax (VAT) to medicine, which started on 1 May 2004; however, the growth dynamics of previous years has been surpassed. It is estimated that, with a price increase of 25 to 30% in pharmacies, medicines will correspondingly become 5 to 10% more expensive. Still, the current priority is in the price increase for the reimbursed medicines that will require additional funds not from the residents, but from the state budget [6].

In this respect, the important issue is the price growth for pharmaceutical products, which should not be increased only from the aspect of obtaining profit – the price and the profit must be balanced and must be in conformity with the abilities of the consumers. *An increase of the efficiency of prescription drug price control* is the main issue with regard to accessibility of medicines for patients, which already significantly impacts the treatment process at the ambulatory stage, thereby reducing the need for patients to be treated in hospitals, which, in its turn, reduces the state budget expenses.

### 3. Growth of the Pharmaceutical costs

There are some demographical, economic and institutional factors in regard to the costs of medicine [5].

- ❖ **Economic growth.** The development of income has a considerable connection regarding the increase of the pharmaceutical expenditure.
- ❖ **Demographical relations.** It is especially urgent to promote the financing for growing pharmaceutical needs for older people.
- ❖ **Large investments in pharmaceutical research and development.** The manufacturing facilities and processes of all pharmaceutical companies must adhere to strict quality control producers and standards, and are subjected to stringent inspections by regulatory health authorities. It has been noticed during the 12 years period for the drug development and introduction of the new pharmaceuticals.

In order to reach the level of profit of the pharmaceutical production, the large-scale investments in the business education and information supply in regard to the new pharmaceuticals introduction is invested in the study.

- ❖ **Patent protection for pharmaceutical products.** The production of the substance containing the effective drugs component is relatively simple. In order to promote the development of new drugs, pharmaceutical manufacturer could receive patent protection. Pharmaceutical patent protection forms the monopoly situation for some certain substances. The drugs profit could be restricted from several factors. It is the competition between the pharmaceutical producers due to the similar patented drugs. In this case, the monopoly is fixed to achieve the maximum pharmaceutical profit for some period.
- ❖ **Pharmaceutical pricing.** The competition level affects the pharmaceutical expenditure. There is more regulated market in Europe in regard to the pharmaceutical competition, pharmacies location rules and pharmaceutical pricing. The retail medicines are more restricted with similar price system in all pharmacies in Germany. The strict regulation regarding pharmacies location rules is 418 in Austria.

#### **4. Pharmaceutical prices and the pharmaceutical reimbursement price control in Latvia**

##### **4.1. Price regulation**

General principles of the reimbursement system of pharmaceuticals are set in the Cabinet Regulations of the Republic of Latvia No. 899 of 31 October 2006 [1].

##### **4.2. Pharmaceutical reimbursement system**

The reimbursement of pharmaceuticals shall be provided according to the character and severity of the disease. Diseases are listed in the Appendix No. 1 of the Regulations No. 899 of 31 October 2006[8].

The following reimbursement categories according to the character and severity of the disease are applied: 100%, 90%, 75%, 50%.

Reimbursed pharmaceuticals are prescribed by family doctors and certain specialists who have an agreement with the Health Compulsory Insurance State Agency.

Reimbursement is provided through pharmacies on the basis of a special reimbursable prescription, patients having to pay only the co-payment in the case of 90%, 75% or 50% reimbursement or getting the pharmaceuticals without payment in the 100% reimbursement case.

**The main criteria** for a pharmaceutical product to be reimbursed are:

- 1) the burden of the disease;
- 2) the therapeutic value of the product;
- 3) the cost-effectiveness data;
- 4) impact on health care budget.

To bare the growing expenditure on pharmaceuticals, reimbursement system is based on a range of cost-containment measures:

Supply side measures:

1. a limited list of reimbursable pharmaceuticals;
2. fixed prices for a certain period (up to 2 years);
3. reference pricing mechanism for therapeutically interchangeable products.

Demand side measures:

1. fixed budgets for doctors;
2. special reimbursement conditions for most expensive pharmaceutical products;
3. patient co-payment;
4. rational pharmacotherapy guidelines.

##### **4.3. Wholesalers correction ratios of the pharmaceutical reimbursement products**

Table 1 shows the structure of reimbursement pricing on pharmaceuticals in Latvia

Table 1

Nr.	Pharmaceutical manufacturer price (LVL)	Wholesaler's markup (%)
1.	0.01 – 1.99	10
2.	2.00 – 3.99	9
3.	4.00 – 7.99	7
4.	8.00 – 14.99	6
5.	15.00 – 19.99	5
6.	20.00 and more	4

Source: Principles of the reimbursement pharmaceutical pricing <http://www.zca.gov.lv/2006>

#### 4.4. Pharmacy's correction ratio and the correction sums of the pharmaceutical reimbursement products

Table 2 shows the correction ratio and correction sums for retail pricing of medicine.

Table 2

Nr.	Pharmaceutical reimbursement basis price (LVL)	Correction ratio (%)	Correction sum (LVL)
1.	0.01 – 0.99	1.30	0.00
2.	1.00 – 1.99	1.25	0.05
3.	2.00 – 2.99	1.20	0.15
4.	3.00 – 4.99	1.17	0.30
5.	5.00 – 9.99	1.15	0.40
6.	10.00 – 14.99	1.10	0.90
7.	15.00 – 19.99	1.07	1.35
8.	20.00 – 49.99	1.05	1.75
9.	50.00 and more	1.00	4.25

Source: Principles of the reimbursement pharmaceutical pricing <http://www.zca.gov.lv/2006>

#### Price calculation of the reimbursable drugs

$$KMAC = KBC * k + X + PVN, \quad (1.)$$

where

KMAC – pharmaceutical reimbursement retail price for pharmacies

KBC – reimbursement basis price (LVL);

K – correction ratio;

X – correction sum (LVL)

$$KBC = KMRC + LP, \quad (2.)$$

where

KMRC – pharmaceutical manufacturer reimbursement price, LVL

LP – wholesaler's mark-up

**Price calculation of the reimbursed medicament "Amlocard" based on the example of global generics pharmaceutical leader "Sandoz" (Germany)**



Table 3

Type of the medicine	Amount/mg	Pharmaceutical manufacturer's price, (LVL)	Wholesaler's price, (LVL)	Pharmacies price, (LVL)
Amlocard	10	3.24	3.33	5.14

Wholesaler's price =  $3.24 + 9\% = \text{LVL } 3.33$

Pharmacies price =  $(3.24 * 1.17 + 0.3) * 1.05 = \text{LVL } 5.14$

## 5. Pharmaceutical reimbursement and price regulation in Europe

### 5.1. Distribution of pharmacies in Germany [9]

There are no limitations on the total number of pharmacies. The pharmacies have a monopoly over drug dispensing except to hospitals. There are 21 000 pharmacies in Germany.

#### Reimbursement scheme

All prescription drugs are entitled to reimbursement.

#### Price regulation

Reference price system excluding patented drugs.

#### Principle of the drugs pricing

Pharmaceutical manufacturer free price + 3% (pharmacy's purchase price) + fixed mark-up of the pharmacy  
EUR 8.10 + VAT

### 5.2. Distribution of pharmacies in Sweden

All pharmacies are owned by Apoteksbolaget, a state owned company. There are approximately 882 pharmacies in Sweden, 93 of them in hospitals. They are run by Apoteket AB, which has an exclusive right to sell drugs to the public in Sweden – a unique system by international standards. This also means that Apoteket is obliged to supply all drugs – whether prescription or non-prescription drugs- that are approved for sale in Sweden. Apoteket does not have an exclusive right in the hospital market or where pharmaceutical information is concerned.

#### Reimbursement scheme

Patients accumulate their receipts up to the maximum payable. They then give them to the pharmacists and receive a card entitling them to free health care and supplies of reimbursable drugs for the remaining of the year.

#### Price regulation

Prices are regulated through Apoteksbolaget after negotiations with the manufacturer. The amount that the customer has to pay, i.e., prescription charges, is decided by the Swedish Parliament.

The mark-up that Apoteket makes on the cost of products varies with the pharmacy cost price. It is more for less expensive products and less for more expensive products.

## Conclusions and suggestions

It is necessary to introduce some enhancements on the distribution system of the drugs in Latvia, based on the analysis of the results:

1. The market of medicines is a prerequisite for significant regulation and control of pharmaceutical distribution, expenses of medicines, sale, price formation and usage of medicines.
2. More effective drug distribution in rural regions of Latvia. Attention must be paid to the low income population in rural regions taking into consideration the special diseases and territorial location of pharmacies.
3. To ensure observance of the drug price control. The enforcement of state regulation in the pharmaceutical market, to control the growth of the prices of medicine.
4. To regulate the number of pharmacies in Latvia's cities and towns, to support the pharmaceutical distribution network in country-side.
5. The significance of the reference price system. It is important to develop the pharmaceutical reimbursement system, and to increase the opportunities to get the reimbursable drugs for people with chronic diseases.
6. To enlarge the subsidies for reimbursement drugs in regard to increase of the amount of fixed prices.

## References

1. Noteikumi par kompensējamo zāļu cenu veidošanas principiem. Latvijas Republikas Labklājības Ministrijas noteikumi Nr.899. 2006.gada 31.oktobris. - Latvijas Vēstnesis.
2. Par zāļu cenām un iegādi Baltijas valstīs. 2006.gada 18.janvāris. – Latvijas Vēstnesis.
3. Par Latvijas aptiekām skaitļos. – Internets/ [http:// www.lv.lv/](http://www.lv.lv/) 2005.gada 22.maijs
4. Konceptuālais jautājums nabadzības situācijas risināšanai. – Internets.- [http:// ppd.mk.gov.lv/](http://ppd.mk.gov.lv/) 2008.gada 2.februāris
5. Pharmaceutical pricing - Internets.- <http://www2.riksdagen.se/> 01/ 2000
6. Zāļu cenu monitorēšana.- Internets.-<http://www.vm.gov.lv/> 2005.gada 1.decembris.- Veselības Ministrija
7. Farmaceitu un ārstu portāls. Recepšu medikamentu cenas veidošanas pamatprincipi Vācijā.- Internets.- [http://farmacija-mic.lv./](http://farmacija-mic.lv/) 2004.gada16.septembris.
8. General principles of the Reimbursement System. – <http://www.zca.gov.lv/2006>
9. Pharmaceuticals and Pharmacies – Internets.- <http://www.cesifo-economic-studies.de>

## Strategic Orientation behind the Success of Finnish Family Farms

**Heikki Mäkinen**, M. Sc, University Teacher, Department of Economics and Management, University of Helsinki

**Matti Ylätaalo**, Professor, Department of Economics and Management, University of Helsinki

**Abstract.** The objective of this study was to examine the long run success of farms, to recognise farms in a positive or negative twist of success, and to find factors that can explain the variation in success. The data consisted of financial statements of Finnish book-keeping farms covering the years 1998—2005. The study includes 189 dairy farms and 80 grain farms. A descriptive, backward stepping discriminant analysis was used to find the factors that could explain the class of success individual farms fall into. According to the results, the most successful milk producers have grounded their strategy on economies of size. This has enabled good level of resource utilization which can be observed as increased level of productivity and a low level of net investments. Producers who had been able to raise their level of success had followed the strategy of growth. This had however led to increased level of debt. In addition, they had not been able to achieve as high level of productivity as the initially larger farms, but presumably they have the potential to retain their level of success. Among milk producers of lowest level of success, an ambition to follow strategy of growth is clearly present. However, they are possibly facing problems with farm-specific limits of growth, management of production processes, investments, and funding. Among grain producers, the only strategic orientation with connection to the level of success seemed to relate to an increased level of productivity and a low level of investments.

**Key words:** farm, success, profitability, strategy, discriminant analysis

### Introduction

The success of an enterprise and the factors that contribute to it is an essential question in the field of business economics. The success of an enterprise is usually evaluated by utilizing financial statements, which depict its monetary process. In this kind of analysis, the goal is to assess a firm's economic performance and to predict its development in the future. The value of this traditional analysis can be extended by lengthening the time span of the analysis, which can reveal the direction of development of success. Another extension to the traditional financial statement analysis is a corporate analysis. This consists of an examination of the production process and strategic decisions of the enterprise, which can then be attributed to good or poor economic performance.

In this study, the success of Finnish family farms is examined over an eight-year period of time. The goals of the study are:

- to describe the success of the sample farms over the research period;
- to recognize these farms with a positive or negative features of success;
- to find factors that are strategic in their nature and can explain why some farms are more successful than others.

Generally, a definition of the success of a farm should be based on the level to which the goals of farming have been achieved. The better the goals are achieved the more successful the business. In economic theory, economic efficiency and further profit maximization is widely, but arguably, accepted as a general goal of any enterprise. However, farms are typically family enterprises where the set of goals is diverse. The goals are formed according to the values of the family members, and the goals of the business and the family are in a complex interaction (Wallace and Moss, 2002; Olson 2004, 4; Lourenzani et al. 2005).

The goals of farmers are, on one hand, related to an acceptable level of economic results achieved through farming. But, on the other hand, they form a set of goals that relate to the way of living as a farming family. In this framework, the pursuit of a good financial result must not lead to a decayed quality of life. However, the financial results must be good enough to enable the desired way of living. In an ideal situation the success of a farm would not only be analyzed according to the key financial figures but also according to the conception of success that the members of the family have. The extent to which the non-financial goals

of a farming family can be reached is largely dependent on the level of economic preconditions, e.g., the profitability, liquidity and solidity of the farming business. According to Latukka (1998), the profitability coefficient was the best predictor of the adequacy of money income to cover the expenses of farming. Thus, if a reasonable level of farm income and a sustainable level of solidity are among the important goals of farming, it is justifiable to measure success by using the profitability figures of a farming business.

Searching for factors that affect the success of a farm is a central part of the research field of farm management. These kinds of analyses usually take place within a framework that is comprised of the farm enterprise, the farmer, and the external operating environment. The farmer and his ability to manage the production, marketing, financing, and resource allocation of the business is in the middle. The essential aspects of management are the definition of goals, the planning processes, and controlling, all of which produce information for the decision-making process. External factors such as environmental conditions, markets and political regulation are crucial in determining how successful the farm can be. Also, they largely determine what kind of management the farmer should accomplish. As a whole, this framework is wide and complex, but it is a good aid in piecing together the factors that can influence the success of a farm enterprise.

Strategic management is the base for all other managerial functions focusing on the most important factors of success. Such issues that affect the whole enterprise and are essential for its success can be characterized as strategic (Pearson 1990, 20; Neilimo and Uusi-Rauva 2005). According to Olson (2004), strategy consists of the means that affect a farm's position among competitors, satisfaction of customers, performance, and achievement of the farmer's long term goals. A consciously formed strategy can help the farmer to commit to the long run management and development of the business in an uncertain environment. Like Ondersteijn et al. (2003) point out; the strategy can also be seen as a path from the current situation of the business to a desired state, a vision of the farm in the future.

Strategic management of a farm is a continuously changing process, which is based on the core mission of the business as well as on a definition of goals, an analysis of resources and environment of the farm, and an analysis of the farmer's managerial skills (Kay and Edwards 1999; Olson 2004; Larsen 2003). In practical farm management, it is not adequate to strive to do the things right. Instead, the main interest of the farmer should be on doing the right things: on the situation of the farm and on the direction in which it should be led. The number of possible strategies for a given farm varies a lot. Some farms may have several alternatives to choose from, but for others there may be fewer options available. In any case, strategies should be based on a combination of the most promising opportunities and the biggest strengths of the farm.

The long term success of a farm rests on the strategy that the farmer has chosen to implement. From this viewpoint, it is reasonable to search for reasons for good or poor results based on the strategic orientation of the farmer. Hansen et al. (2005) depict the dependencies between a farmer's attributes, e.g., his values and attitudes, his strategic orientation, and the success of his business with a model in Figure 1. Factors on the psychological level relate to a farmer's motivation and attitudes. These largely determine the goals that the farmer then tries to achieve with his business strategy. Putting this strategy into action is a managerial task that, together with the operational management of the production processes, determines the productivity and technical efficiency of the farm. Taking externally given prices into account, these then result as the financial performance of the farm.

This study is mainly concerned with strategic orientation as a success factor. However, describing the strategy of a farm is not unambiguous since, according to Grant (1997), strategies of enterprises can be divided into planned and actual ones. A planned strategy is something that the entrepreneur has defined and aims to follow, and an actual strategy is the implemented version of it. Continuing this reasoning further leads to a conclusion that the strategic orientation of a firm can be evaluated according to what the strategy seems to have been. A truly reliable evaluation of different strategic orientations and their influence on the success of enterprises would require that there is empirical data available concerning the planned and actual strategies of enterprises. In this study, however, the evaluation of different strategic orientations was based on an explorative analysis of such figures from financial statements that can be seen as strategic in their nature by depicting properties of the whole farm and its strategic orientation.

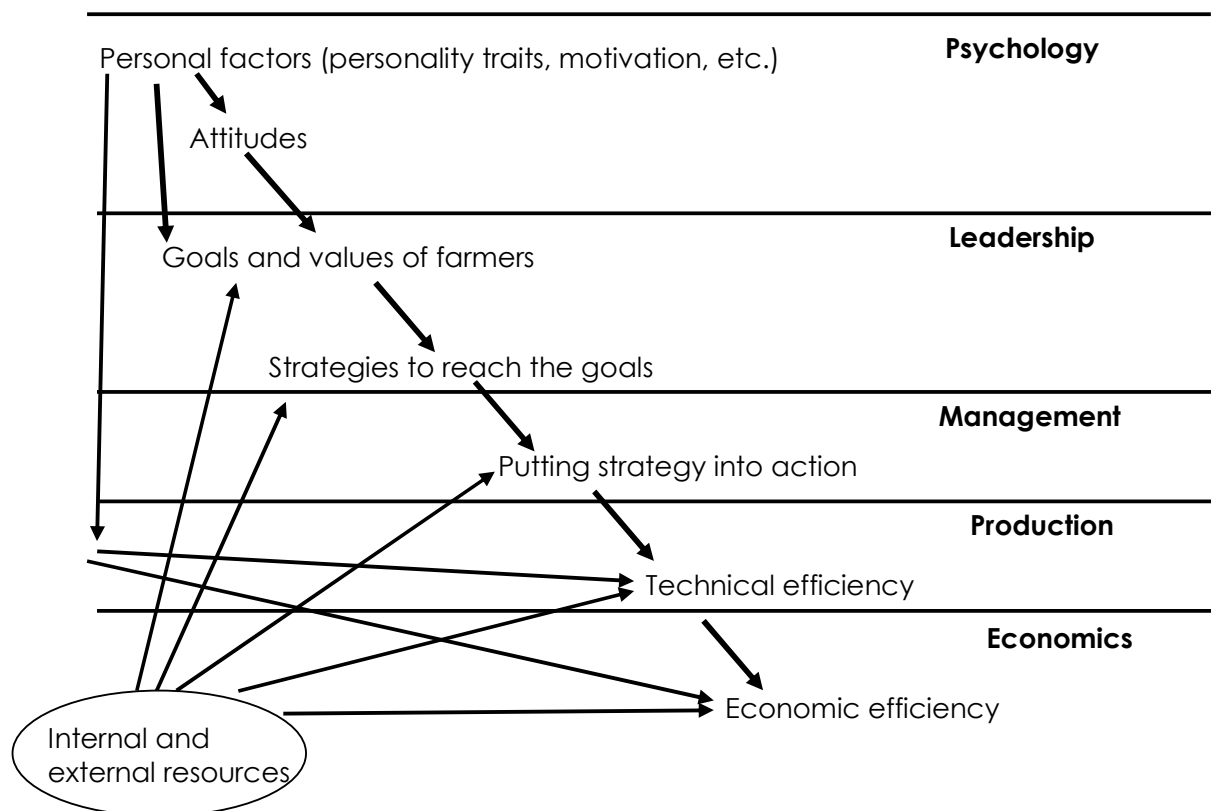


Figure 1. A model of farmer's economic behaviour (Hansen et al., 2005)

### Data and methods

The data set of this study consisted of balance sheets and income statements of a panel of Finnish book keeping farms from the period of 1998 – 2005. The data comprised 189 dairy farms and 80 grain farms without changes in their main line of production. A change in the main line of production is such a big strategic change in a farm's operation that it would dominate over all other features of the strategic orientation, which is the main area of focus in this paper.

A profitability coefficient was used as the indicator of success. It is calculated by dividing the farm family income by the sum of the required compensation for the work of the farm family and the required rent for their own capital invested in the farm. The variation of profitability from year to year is typically notable, especially on grain farms. This was compensated by using averages for 1998-2000 as the values for the beginning of the research period and averages for 2004-2005 as the values for the end of the period.

Farms were ranked into the ascending order according to the level of the profitability coefficient and then divided into three equally sized profitability groups at the beginning of the period, and, using the same numerical values as limits between groups, again at the end of the period. Profitability classes of farms were then cross-tabulated between the beginning and the end of the period. This cross tabulation produced nine different combinations of profitability classes. This means that the set of farms was divided into nine success groups according to whether they had stayed in the lowest, middle or highest class, fallen into a lower class or had risen into a higher class of profitability. Explanations for farms' falling into different success groups were then researched with a discriminant analysis. Possible separating variables (Table 1) were selected and calculated from the balance sheets and income statements so that they could be seen as depictees of the strategic orientation of farmers.

Table 1

### Explanatory variables of the discriminant analysis

<i>Size of the farm at the beginning of the period</i>	- turnover as an average over 1998-2000 - cultivated area in 1998
<i>Growth of the farm</i>	- growth of turnover (%) - growth of cultivated area over the period (%)
<i>Investment activity</i>	- total change of the net value of machinery divided by the sum of value added over the period - total change of the net value of buildings divided by the sum of value added over the period (value added is defined as total product minus variable and fixed costs without the required compensation for the work of the farm family)
<i>Change of productivity</i>	- the change of gross margin per cent during the period divided by the gross margin at the beginning of the period (as an approximation of the change of productivity)
<i>Level of indebtedness</i>	- equity ratio
<i>Change of level of indebtedness</i>	- change of equity ratio over the period (%)
<i>Focusing on core business</i>	- percentage of cattle income of total income on dairy farms - percentage of grain income of total income on grain farms (as an average over the period, total income without direct supports)

### Results

The transition matrix in Table 2 presents the results of the cross tabulation analysis of farms in different profitability classes at the beginning and end of the research period. The lowest profitability class of dairy farms consisted of farms with a profitability coefficient lower than 0.558 whereas the highest profitability class of dairy farms had a profitability coefficient higher than 0.746. On grain farms, these limits were 0.259 and 0.651 respectively.

Profitability at the beginning of the period correlated positively with profitability at the end of the period at a statistically significant level for both dairy farms and grain farms. At the beginning of the period there were 63 dairy farms in each class of profitability. The overall level of profitability decreased over the period, since almost half of the dairy farms (94) belonged to the lowest profitability class by the end of the period. On the other hand, several farms had been able to move into a higher class of profitability during the period. According to a  $X^2$  test, the classification of the dairy farms at the end of the period was significantly dependent on their classification at the beginning of the period ( $X^2=58.5$ ,  $p<0.0001$ ). A similar dependency was observed for grain farms ( $X^2=11.1$ ,  $p=0.025$ ). Respectively, there were more shifts from higher to lower profitability classes in the grain farm group than vice versa.

The nine success groups produced by the three-times-three cross tabulation combined with a relatively small set of farms was a little troublesome from the point of view of a proper discriminate analysis. In some groups there were fewer observations than possible discriminating variables, which led to an over-estimation of the explanatory power of the analysis. To avoid this problem, the original nine groups were combined into four larger ones according to a preliminary discriminate analysis and a variance analysis of the discriminating variables.

Table 2

**Transition matrix of farms in different profitability classes at the beginning and end of the research period, number of farms (the respective percentage in parenthesis)**

<b>Dairy farms (n=189)</b>				
Profitability class at the beginning of the period	Profitability class at the end of the period			<b>Row</b>
	Lowest	Medium	Highest	<b>Total</b>
Lowest	51 (27.0)	7 (3.7)	5 (2.7)	<b>63</b> (33.3)
Medium	31 (16.4)	24 (12.7)	8 (4.2)	<b>63</b> (33.3)
Highest	12 (6.4)	22 (11.6)	29 (15.3)	<b>63</b> (33.3)
<b>Column Total</b>	<b>94</b> (49.8)	<b>53</b> (28.0)	<b>42</b> (22.2)	<b>189</b> (100.0)
<b>Grain farms (n=80)</b>				
Profitability class at the beginning of the period	Profitability class at the end of the period			<b>Row</b>
	Lowest	Medium	Highest	<b>Total</b>
Lowest	15 (18.8)	9 (11.3)	2 (2.5)	<b>26</b> (32.5)
Medium	9 (11.3)	12 (15.0)	6 (7.5)	<b>27</b> (33.8)
Highest	6 (7.5)	10 (12.5)	11 (13.8)	<b>27</b> (33.8)
<b>Column Total</b>	<b>30</b> (38.6)	<b>31</b> (38.8)	<b>19</b> (23.8)	<b>80</b> (100.0)

The new groups were formed as follows:

1. A farm was classified as poorly successful if it had stayed in the lowest class of profitability over the entire period or had fallen into it from a higher class (94 dairy farms, 30 grain farms).
2. A farm was classified as an improver, if it had moved into a higher class of profitability (20 dairy farms, 17 grain farms).
3. The middle group consisted of farms that had stayed in the middle class of profitability or moved into it from the highest group during the period (46 dairy farms, 22 grain farms).
4. A farm was classified as successful if it had stayed in the highest class of profitability over the period (29 dairy farms, 11 grain farms).

A backward-stepping discriminant analysis of the dairy farm data produced three discriminant functions. The first two of these were statistically significant, covering 93 per cent of the variance of the solution. Seven discriminating variables were significant: the change of gross margin per cent, the equity ratio at the beginning, the change of equity ratio, the turnover at the beginning, the change of turnover, the percentage of cattle income of total income, and the degree of machinery net investments. In the grain farm data, only a change of gross margin per cent and the degree of machinery net investments were significant discriminants. Together they formed one statistically significant discriminant function. The found discriminant functions were able to correctly re-classify only a little over half of the farms. This can be partially seen as an expected result: the original profitability classes and corresponding success groups were formed strictly according to the numerical levels of the profitability coefficient, which may lead to a classification where almost identical farms fall into different groups of success.

Canonical discriminant functions are multidimensional combinations of discriminating variables that contribute to the discrimination of the groups. Their standardized coefficients and weights are presented in Table 3. In the first canonical function of the dairy farm analysis the change of gross margin per cent, the equity ratio at the beginning, and the turnover at the beginning got the largest positive weights. The degree of machine net investments has the largest negative weight. Together these variables can be seen as depictees of large scale, a relatively low level of investment activity and increased efficiency in the production processes. The first canonical variable was thus named as “economies of size”. The second canonical discriminant function was characterised by a large positive weight of the growth of turnover. All other discriminating variables had negative weights close to zero and differed from their loadings on the first canonical function. Thus, the second canonical variable gave a picture of noteworthy growth, an increased amount of debt and relatively high investment activity, and was named as “growth”.

The only significant discriminant function of the grain farm analysis produced a canonical function where the change of gross margin percent had a large positive weight and the degree of machine net investments carried a large negative weight. Together they clearly relate to the development of productivity. Thus, “increase of productivity” was an appropriate name for the corresponding canonical variable.

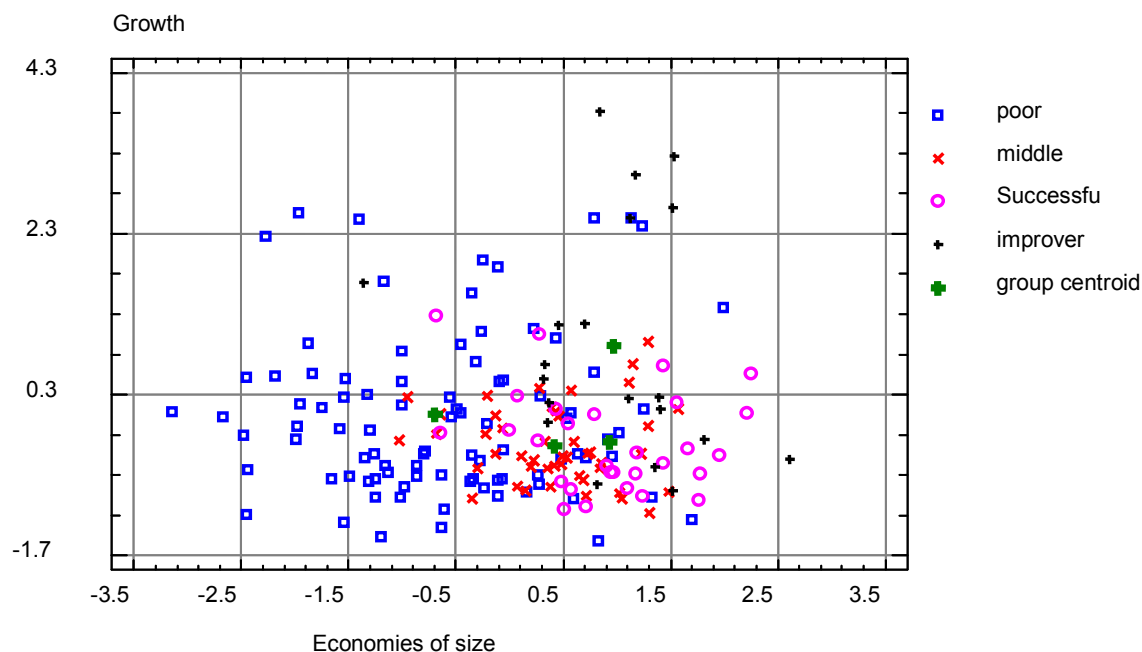
Table 3

**Significant discriminating variables and their standardized weights in discriminant functions to separate farms into different success groups (canonical discriminant functions)**

Discriminating variable	Dairy farms		Grain farms
	Discriminant Function F1: "Economies of size"	Discriminant Function F2: "Growth"	Discriminant Function F1: "Increase of productivity"
Change of gross margin per cent	0.80	-0.13	0.95
Equity ratio at the beginning	0.50	-0.35	--
Change of equity ratio	0.46	-0.19	--
Turnover at the beginning	0.52	-0.17	--
Change of turnover	0.06	0.96	--
Animal product as percentage of total product	0.34	-0.15	--
Degree of machine net investments	-0.46	-0.15	-0.52

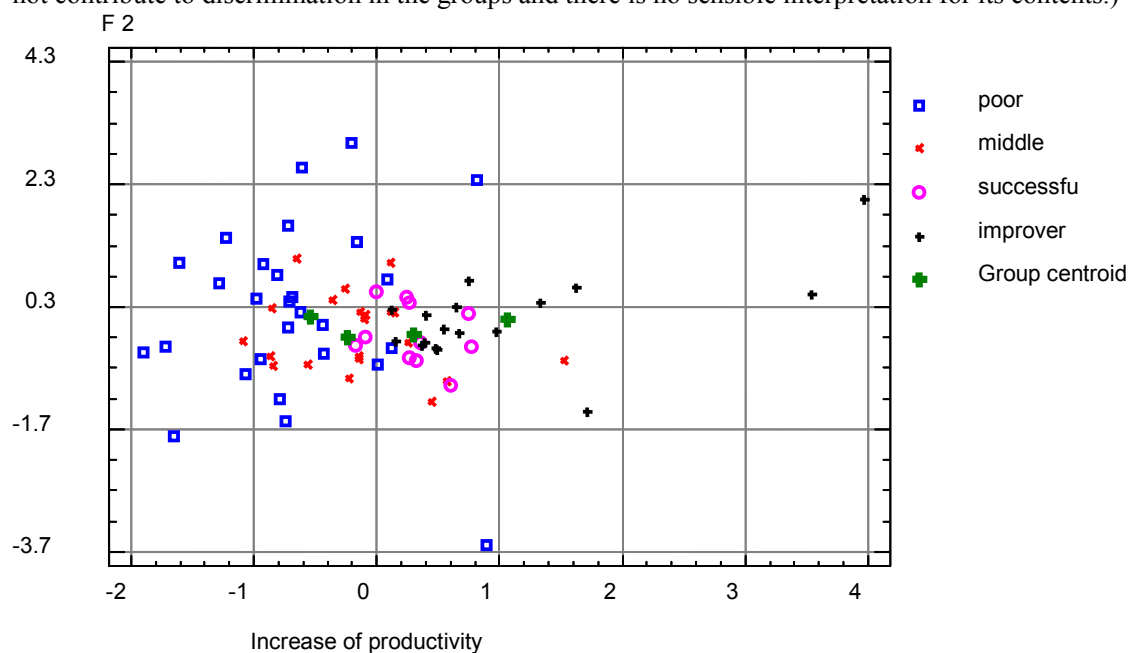
The values of discriminating canonical variables for farms in different success groups are plotted in Figures 2 and 3. In the dairy farm data, the first canonical variable (economies of size) got the highest values in the group of most successful farms and in the group of farms with improved success. The lowest values were associated with the poorly successful farms. The highest values of the second canonical variable (growth) were typically associated with farms in the group of improved success. Among other success groups this variable did not, on average, differ notably. However, there were considerably more farms with high values of growth in the group of poor success than in the groups of middle or good success. Plots of the groups clearly overlap, which is in line with the somewhat low discrimination capability of the analysis.





**Figure 2. A plot of dairy farms in the space of canonical discriminating functions**

The Increase of Productivity variable clearly differentiated success groups in the grain farm data, though an overlapping of the different groups is notable. The group of poor success was typically associated with the lowest values and the groups of best and improved success with the highest values of increase in productivity. (The values in the y-axis of Figure 3 are the values of the second discriminating function. It did not contribute to discrimination in the groups and there is no sensible interpretation for its contents.)



**Figure 3. A plot of grain farms in the space of canonical discriminating functions**

## Conclusions

According to the results of this study, it seems that the strategy of the most successful dairy farms has been based on the utilization of economies of size. Other elements relating to their strategy consist of concentrating on milk production as the core business, on productivity, on a moderate level of investments, and on a good and improved degree of solvency. In regard to the growth of the business, successful dairy farms do not differ notably from less successful farms. Growth has been the dominant feature in the strategy of the farms with improved success. It is observable as a notable growth of turnover, an increased level of debt, and a relatively high investment activity. These farms are, on average, close to the size of the most successful farms. It is justifiable to predict that if they can cope with the debts accumulated during the growth process and succeed in increasing the productivity of their processes, they may establish a relatively good level of success in the future. Dairy farms with the poorest level of success seem to have largely been following the strategy of growth. But, so far they have not managed to implement it in a way that has resulted in an improved success. Possible problems may relate to individual constraints on growth, the management of production processes, the allocation of investments, and an increased amount of debt. Together these may, in some cases, be attributable to a lack of managerial skills of the farmer.

On grain farms, the only strategic orientation that can be associated with the level of success was found to be an increase of productivity. This kind of management includes efficiency in production processes and a very moderate investment activity. The size or growth of the farm, whether measured with turnover or cultivated area, did not contribute to the level of success in the period covered in this study.

## References

1. **Cuykendall, C., LaDue, E. & Smith, R. D.** 2002. What successful small farmers say : the results of a survey of successful small farm operators. Cornell University, Department of Applied Economics and Management, Research Bulletin 2002-01. Ithaca, N.Y. 90 p. Available at: <http://aem.cornell.edu/research/researchpdf/rb0201.pdf>
2. **Grant, R. M.** 2005. Contemporary Strategic Analysis. Oxford: Blackwell Publishing. 5. ed. 548 p. ISBN 1-4051-19999-3.
3. **Hansen, B., Stokstad, G., Hegrenes, A., Sehested, E. & Larsen, S.** 2005. Key Performance Indicators on Dairy Farms. Journal of International Farm Management Vol.3. No.1 - July 2005: 15 p. Available at: [http://www.ifmaonline.org/pdf/journals/Vol3Ed1Pap1\\_Hansen.pdf](http://www.ifmaonline.org/pdf/journals/Vol3Ed1Pap1_Hansen.pdf)
4. **Kjesbu, E. & Flaten, O.** 2005. Perceptions and impacts of Fram-A: A Norwegian Farm Business Development Programme. Congress Proceedings, 15th International Farm Management Conference August 14th to 19th, 2005. 4 p. Available at: <http://www.ifmaonline.org/pdf/congress/05Kjesbu%20Flaten.pdf>
5. **Larsen, T.** 2003. Implementation of Strategic Planning to Local Consultants – FarmStrat by DAAC. In: Hegrenes, A. (ed) 2003. Farm Management. Proceedings of NJF Seminar No. 345. Oslo: Norwegian Agricultural Economics Research Institute. 237 p.
6. **Latukka, A.** 1998. Maatalousyritysten tulorahoituksen riittävyyden ennustaminen neuroverkkomenetelmällä. *Summary: Predicting Financial distress of Farms Using Neural Network Application.* University of Helsinki, Department of Economics and Management, Publications No 22. Helsinki: Dpt. of Economics and Management. 138 s.
7. **Lourenzani, W., Queiroz, T. & de Souza Filho, H.** 2005. Strategic Mapping Of The Rural Firm: A Balanced Scorecard Approach. Congress Proceeding, 15th International Farm Management Conference August 14th to 19th. 8 p. Available at <http://www.ifmaonline.org/pdf/congress/05Lourenzani%20et%20al.pdf>
8. **Metsämuuronen, J.** 2005. Tutkimuksen tekemisen perusteet ihmistieteissä. Jyväskylä: 3. painos. International Methelp. 1292 s. ISBN 952-5372-18-9.
9. **Neilimo, K. & Uusi-Rauva, E.** 2005. Johdon laskentatoimi. Helsinki: 6. painos. Edita Publishing. 366 s. ISBN: 978-951-37-4109-9.

10. **Olson, K.** 2004. *Farm Management, Principles and Strategies*. Iowa: 1st ed. Iowa State Press. 429 p. ISBN 0-8138-0418-3.
11. **Ondersteijn, C., Giesen, G. & Huirne, R.** 2003. Identification of farmer characteristics and farm strategies explaining changes in environmental management and environmental and economic performance of dairy farms. *Agricultural Systems* 78: 31-55.
12. **Pearson, G.** 1990. *Strategic Thinking*. 237 s. Essex: Pearson Education. 367 p. ISBN 0-273-64623-0.
13. **Robinson, M.** 2000. Clarification and Identification of Relevant Business Objectives. *Farm Management*, Vol. 10, No. 8: 486-498.
14. **Wallace, M. & Moss, J.** 2002. Farmer Decision-Making with Conflicting Goals: A Recursive Strategic Programming Analysis. *Journal of Agricultural Economics*, Vol. 53, No 1: 82-100.
15. **Vandermersch, M. & Mathijs, E.** 2004. The Impact of Management Attitudes on The Financial Performance of Flemish Dairy Farms. *Farm Management* Vol. 11 No. 11: 637-648.

## **Influence of the Bonitation Value and Sold Area on the Single Price of Arable Lands Sold from the Resources of State Agricultural Property**

**Monika Mejszelis**

Zakład Prawa i Gospodarki Nieruchomościami, Akademia Rolnicza, ul. Żołnierska 47, 71-210 Szczecin, mmejszelis@e-ar.pl

### **Abstract**

The aim of this study was the definition of changes occurring on the land market on the example of Pyrzyce district, mainly on the basis of the bonitation value and the sold area for the single price. The article pointed to an inconsistency of the segment of agricultural estate market, on which lands purchased are the subject of trade with the aim of conducting production activity in agriculture there, and purchased for extra-agricultural purposes.

**Key words:** agricultural area, land turnover, prices level, soil evaluation

### **Introduction**

In the modern times, agriculture still remains the leading function of rural areas, and a balanced development of rural areas is still tightly connected with a balanced development of agriculture. According to H. Runowski, the term “balanced development” is a development which postulates a striving to achieve the balance between different aims of social and economic development<sup>12</sup>. Since the conference in Rio (the year 1992), it has been accepted that a balanced development (stable) does not only bear ecological importance, but also serves production, economic, and social purposes. In the light of the recent research, the possibilities of agricultural development should be evaluated and considered on the national level (regional) and on the local level (villages, arable farms).

On the territory of the West Pomeranian voivodeship, there is – both in the economic, and in the social sphere – a peculiar “problematicity”, which manifests itself, above all, in structural unemployment in the countryside, in the need to see the village in the aspect of a place of life and work of the farmers, and the people indirectly connected with agriculture. The consequence of this phenomenon is the necessity to strengthen the farms not only because they produce food in the most reasonable way, but also because they shape the way of life and decide upon the social and cultural image of the Polish village<sup>13</sup>. The resources of production factors – live force, arable lands, and capital are the basic elements of the production potential of agriculture. Their quantity, quality and binary relations determine the production potential of agriculture.

Land, among other agricultural factors of production is considered the most important factor. Its character has considerable impact on the economy of manufacturing, in the economic understanding, it fulfils the same function as the capital – its possession should be the source of income, and the most important elements defining its role in manufacturing are: land resources, the quality of land resources and the relation between land, capital and work<sup>14</sup>. The agricultural real estate market in this aspect draws the interest of potential buyers mainly due to the following aspects:

- the possibility of improving the structure of using the lands in an arable farm,
- enlarging the existing arable farm,
- creating an arable farm (most often concerns lands sold by the APA, often with buildings and the so-called extra-residential property).

---

12 Runowski H., 2002, Rozwój zrównoważony rolnictwa i gospodarstw rodzinnych. w: Wieś i rolnictwo – perspektywy rozwoju. IERiGŻ, IRWiR PAN, SGH, Warszawa.

13 Kaleta A., 1998, Rolnictwo i wieś europejska. Od korzeni ku współczesnej przyszłości w XXI wieku, UMK i IRWiR PAN, Toruń-Warszawa.

14 Poczta W., Rolnictwo polskie..., op.cit.

Low profitability of production has an effect on the price level of arable lands, which is still relatively low. Moreover, purchasing land for the purpose of conducting production there bears validity mainly for grand stock farms, which are able to compete on European markets. An exception includes lands of small acreage, used for special segments of production.

There is another aspect of real estate trade in agricultural regions, which is connected with the diversification of economic activity in rural regions and a recently more popular relocation of production activity from large urban areas to village and urban-village communities. This stems from the presumption that the rural region does not have to be, against the common opinion, less competitive in relation to the urban area, if, in the place of agricultural mono-functionality, it is possible to implement multi-functional development – based on the development of service-production function, in small and medium size enterprises, tourism (including ecological tourism), trade, non-production service, and to introduce other extra-agricultural forms of economic activity<sup>15</sup>. The consequence of this is a stable increase in the demand for lands of extra-agricultural possibilities of management. This concern, in particular, the areas situated within the range of interaction of city agglomerations and characterized by high communicational accessibility. The localization of the economic activity on the non-urbanized territories, on the one hand, allows the lowering the costs, and on the other hand, creates the possibility of economic revival of the region (additional workplaces) - particularly in the areas covered with structural unemployment.

### **The purpose and method of research**

Currently, the West Pomeranian voivodeship has been divided into six large-scale areas of similar functional and structural – special features, due to environmental and economic diversity, preferences, and potential for development of particular communities. These are:

- I. the seaside zone – intensive selective development,
- II. the zone of agricultural economy and a multi-functional economic activation,
- III. the zone of agricultural – forest economy, selective economic activation, including the development of tourist function,
- IV. the zone of intensive agricultural economy,
- V. the zone of the concentration of urbanization processes – the Szczecin metropolis area,
- VI. the zone of intensive, multi-functional development and urbanization – the Koszulin node area.

Pyrzyce district is situated in the VI multi-spacious area. This is a zone of very intensive agriculture, agricultural-foodstuff industry and the development of service-production function and economic activation – the zone of supply for urban areas. Moreover, the strategy of development for the West Pomeranian voivodeship up to the year 2020 presumes the promotion of special departments of agriculture, and in the southern part, the development of the tourist function.

The aim of the study is the definition of changes occurring on the land market on the example of Pyrzyce district, mainly on the basis of the bonitation value and the sold area for the single price. This district has been chosen due to its agricultural character and the bonitation value of the used arable lands. The territory of Pyrzyce district locates the highest amount of very good and good lands in the West Pomeranian voivodeship.

The researched area covered the communities: Bielice, Kozielice, Lipiany, Przelewice, Pyrzyce and Warnice. The research was conducted on the transactions of sale of free agricultural estate, sold from the Resources of the State Agricultural Property in the years 2000-2004. The borderline of the separated local market overlaps with the administration borderlines of Pyrzyce district. All analysed land real estate has been sold by means of bidding. The results of the research have been compiled with the use of statistical methods, including the use of the Chi-square independence tests, structural analysis and variation analysis.

---

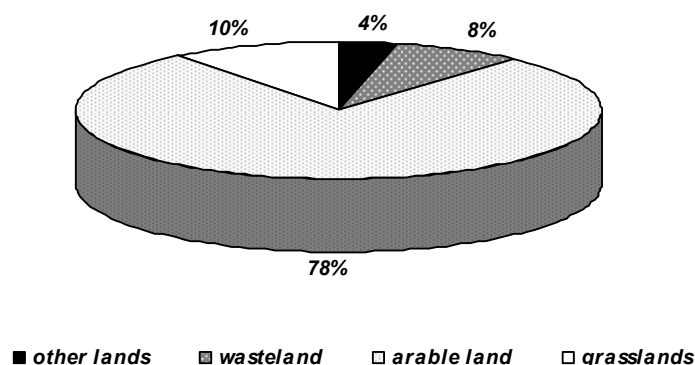
<sup>15</sup> Wizja polityki zrównoważonego rozwoju obszarów wiejskich w rozszerzonej Europie (Raport europejskich ekspertów). „Wieś i Rolnictwo” nr 3, Warszawa 2004.

### The sale of agricultural estate from the resources of the SAP

In the matter of market trade, the basic forms of real estate purchase are purchase – sale and lease agreements. Moreover, the purchaser may be a natural or legal entity. The West Pomeranian voivodeship belonged, and still belongs to the voivodeships, in which the public sector (up to the nineties of the previous age, the sector was socialized) administrated and still administrates the highest percentage of lands. In this case, that is the lands sold in the public sector, the bidding procedure is in force, with the exception of situations defined in the act concerning the management of real estate of the State (agency resources) and the act concerning the management of real estate (communal resources). The conducted research leads to the conclusion that village communities rarely sell arable lands. Therefore, from the point of the possibilities of their agricultural use and the scale of the phenomenon, they do not have importance for the trade with arable land.

Between 2000 and 2004 the Agricultural Property Agency has sold in total 197 agricultural estates on the territory of Pyrzyce district. However, the examined transactional data refer only to the estates, in the case of which it was possible to determine the price for the land. The research left out the estates, which have a building as a counterpart, and it was not possible to establish a separate price for the land and the building. Moreover, all of the arable estates included in the research have been sold by means of bidding.

The conducted statistical analysis of the sold lands enabled the estimation of the general tendencies occurring on the local land real estate market in terms of the single price and the sold area. In the examined period, the APA sold land of the total area of 2.45 thousand ha, including nearly 2.15 thousand ha of arable lands. The remaining lands are: forested and wooded lands, lands under waters, settlement areas and fallows. As far as the structure of the sold acreage of land is concerned, the biggest percentage consisted of arable lands (78%). The total sum of the sold stable green arable lands and fallows was similar (Figure 1).



Source: mejszelis m., 2006: obrót nieruchomościami rolnymi na przykładzie powiatu pyrzyckiego, *oeconomica* (45), nr 249, zeszyty naukowe akademii rolniczej w szczecinie, szczecin.

**Figure 1. The sales structure of arable estates in the years 2000-2004**

The structural analysis of 1 ha price has been conducted in 4 variants (Table 1). In the first variant, the research has been conducted on all observations. In the segment of agency lands, a half of the estates have been sold for a price cheaper than 6.5 thousand PLN/ha.

The arithmetic mean balanced on the level higher, than the median, and approaching the value of the upper quartile, that is up to 12.5 thousand PLN/ha. One fourth of the transactions were conducted for a price lower than 5.2 thousand PLN/ha. The vicissitude index, based on standard aberration, indicates a very diversified statistically collection. Therefore, also due to an extremely asymmetric layout of single price, the arithmetic mean should not be used as a measure for the average price of arable lands. As a result, in the remaining three variants, the disaggregation of the examined collection has been performed. The general of the sold lands has been divided into lands of the area not exceeding 1 ha, lands in the range from 1 to 10 ha, and lands exceeding 10 ha of the sold land. An assumption has been accepted which claims that the land areas over 1 ha have been purchased for the purpose of conducting economic activity

on them in the future. However, the land parcels of a relatively small acreage, from the point of agricultural usefulness, in many cases were purchased with an aim different from the agricultural one. These presumptions are confirmed by the parameter values, which point to the prices characteristic for land areas of extra-agricultural way of management. Certainly, these prices differ significantly from the prices for land used for agricultural purposes. Also in the case of land areas up to 1 ha, a considerable diversification of the examined collection with reference to the single price has been stated.

Table 1

Parameters of price structure for 1 ha of land sold in the years 2000-2004

<i>Parametr</i> <i>Symbol</i>	<i>Units of measurement</i>	<i>The entire farmalands</i>	<i>Farmlands - hectare (0,1]</i>	<i>Farmlands - hectare (1,10]</i>	<i>Farmlands - hectare (10,105]</i>
<b>n</b>	-	<b>197</b>	<b>77</b>	<b>54</b>	<b>66</b>
<b>x<sub>sr</sub></b>	PLN	<b>6 821</b>	<b>21 568</b>	<b>6 392</b>	<b>7 122</b>
<b>Q<sub>1</sub></b>	PLN	<b>5 226</b>	<b>7 308</b>	<b>4 505</b>	<b>4 712</b>
<b>M (Q<sub>2</sub>)</b>	PLN	<b>1 136</b>	<b>12 560</b>	<b>5 898</b>	<b>5 721</b>
<b>Q<sub>3</sub></b>	PLN	<b>12 500</b>	<b>29 284</b>	<b>7 430</b>	<b>8 501</b>
<b>x<sub>min</sub></b>	PLN	<b>1 134</b>	<b>1 134</b>	<b>1 200</b>	<b>1 692</b>
<b>x<sub>max</sub></b>	PLN	<b>73 352</b>	<b>73 352</b>	<b>13 137</b>	<b>17 916</b>
<b>S</b>	PLN	<b>14 691</b>	<b>20 086</b>	<b>2 889</b>	<b>3 680</b>
<b>V<sub>s</sub></b>	-	<b>215,38%</b>	<b>93,13%</b>	<b>45,20%</b>	<b>51,67%</b>
<b>V<sub>Q</sub></b>	-	<b>41,04%</b>	<b>60,06%</b>	<b>24,51%</b>	<b>28,68%</b>
<b>A<sub>2</sub></b>	-	<b>2,12</b>	<b>0,52</b>	<b>0,05</b>	<b>0,47</b>

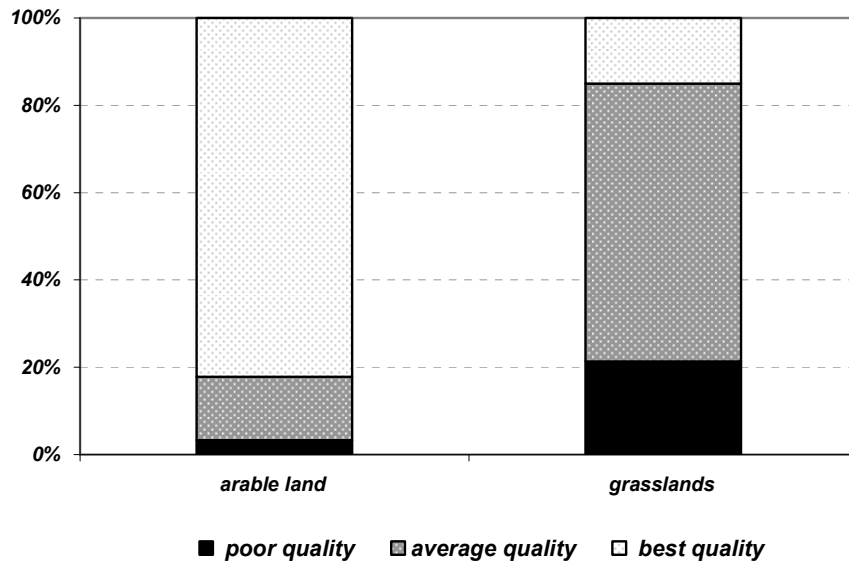
Source: research done by the author

In the case of lands of the area exceeding 1 ha, a significantly smaller variation of single price may be observed. The arithmetic mean for the examined collection equalled between 6.3 and 7.1 thousand PLN/ha. In both cases, a half of the estates reached the price exceeding 5.7 – 5.8 thousand PLN/ha. Moreover, the indexes of vicissitude balanced on the level lower than 50%, which may lead to the conclusion that the parameter values presented in the third and fourth variant characterize the price level on the land market much better than the same parameters calculated for the general transactions.

### Bonitational value and the area of arable estates

The soil conditions of the West Pomeranian voivodeship are characterized by a great spacious diversification. In the quality structure of the soils, the dominating ones are medium soils, which take up to 51% of the area, very good and good soil – 24%, and the remaining part of the area is characterized by weak and very weak soils. In the east of the voivodeship, the prevalent soils are medium and weak soils. In Szczecin, Drawsko and Goleniów districts, the percentage of good soils does not exceed 7% of the total area of arable lands. The best soil conditions occur – that is know by now – in Pyrzyce district (74.5% of the soils are of the I-III b class), which determines its agricultural character. The basic soil type are brown soils (The Pyrzyce Lowland) of the bonitation value from II to IV class and the so-called humus, which is included into the I to III bonitation classes. The structure of land sales with reference to the bonitation value points to the advantage of soils of high arable usefulness in trade (Figure 2). In case of arable land, the total area of soils with good bonitation value, that is the land of the classes I, II, and III equalled to nearly 1.6 thousand ha (82%). The participation in the trade of arable lands of weak bonitation value has been shaped on the level of 3%. The situation referring to stable green arable lands has been displayed as a bit worse. Nearly a half of the sold land are soils of medium quality that is III and IV class, one fifth of the total of the sold meadows and pastures were soils of weak bonitation value, that is V and VI class. To

exclude the eventual independence of some traits chosen for the research, which describe the estates in reference to the achieved price of 1 ha of the land, a Chi-square test has been conducted. On the level of relevance  $\alpha = 0.01$ , a zero hypothesis claiming that both of the traits were independent ( $\chi^2=25.85792$ ,  $df=4$ ,  $p=.00003$ ) has been rejected.

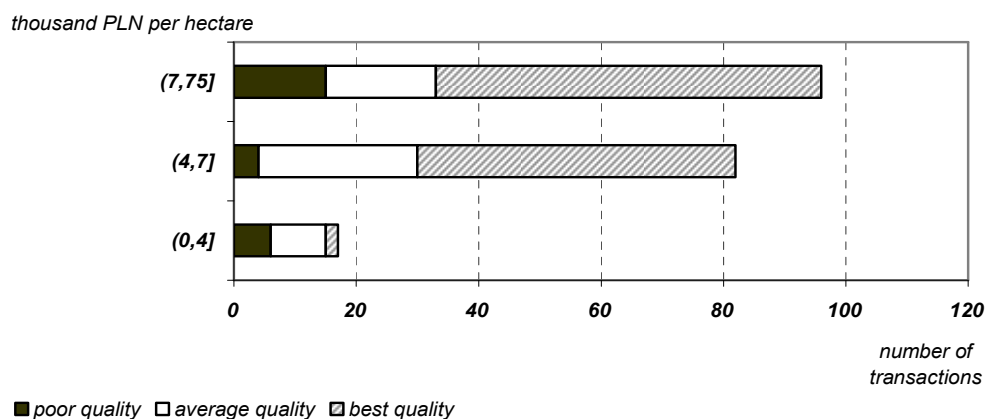


Source: Mejszelis M., 2006: Obrót nieruchomościami rolnymi na przykładzie powiatu pyrzyckiego, *Oeconomia* (45), nr 249, Zeszyty Naukowe Akademii Rolniczej w Szczecinie, Szczecin

**Figure 2. Bonitation value of arable lands**

About 87% of the sold estates were characterized by medium and good bonitation value of the soil (Fig. 3). On the basis of the conducted research, it can be claimed that good lands have considerably more often reached a higher level of prices on the market. In the group of estates over 4 thousand and 7 thousand, this percentage has balanced properly on the level of 63% and 67% respectively. In the case of the cheapest land areas, this percentage did not exceed 12%. Moreover, the level of probability is very low, and the C contingency level is shaped on the level of 0.34 for the maximum value of 0.816, which certifies rather medium correlation dependence.

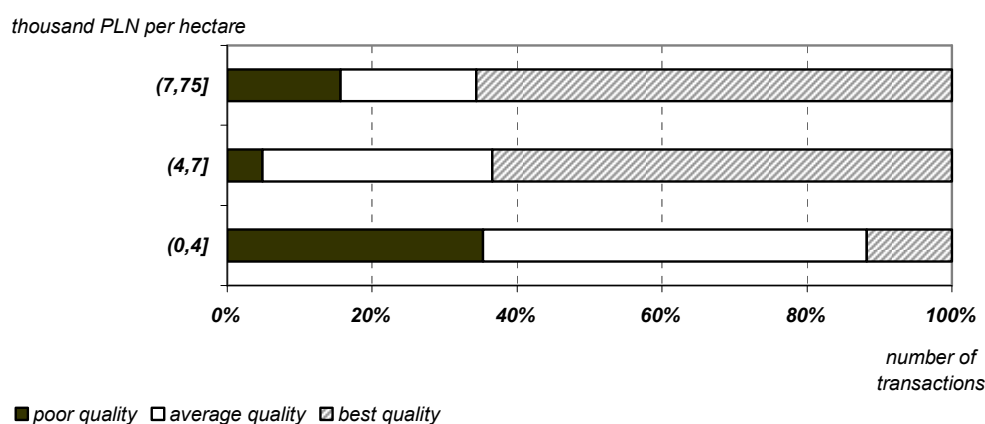
A)



**Figure 3a. Single price and bonitation value in area groups**



B)

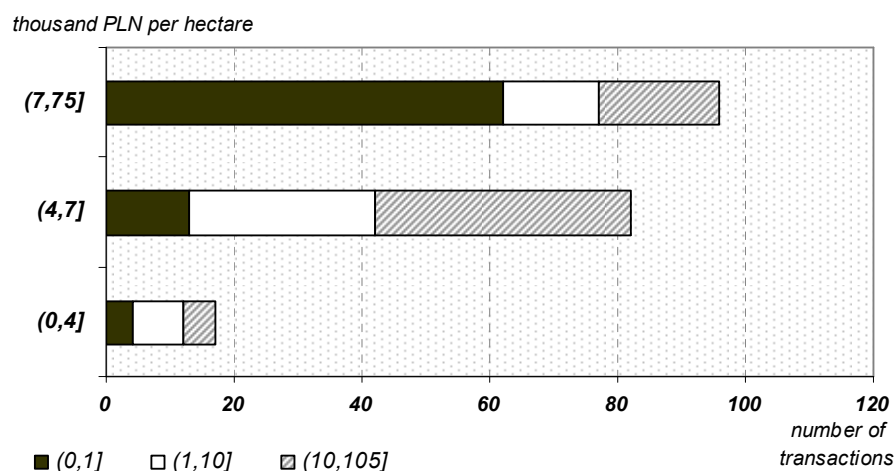


Source: research done by the author

**Figure 3b. Single price and bonitation value in area groups**

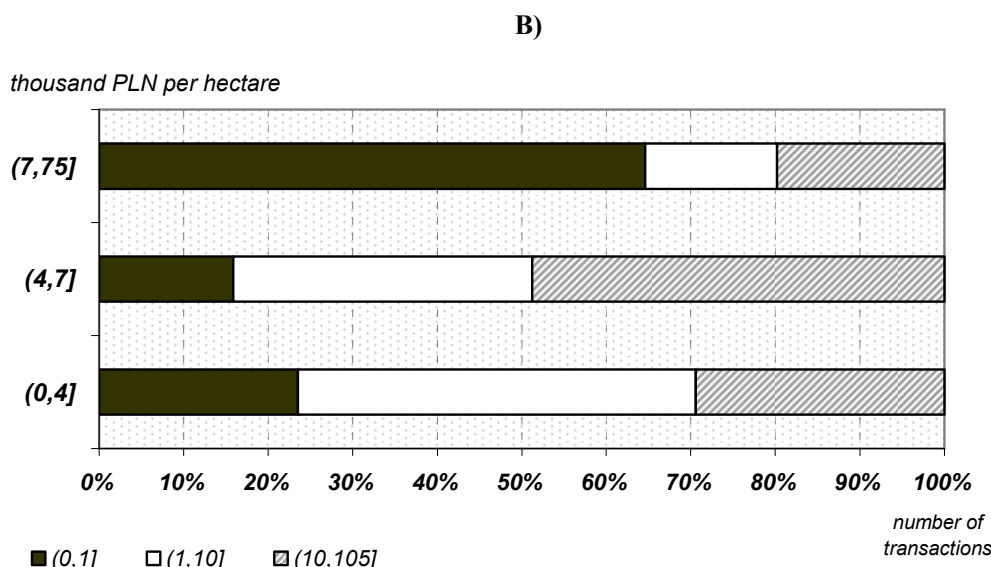
Taking into consideration the layout of areas of estates sold on the territory of Pyrzyce district, an extreme right-hand asymmetry of the layout has been indicated. This means that the majority of transactions recorded on the market concerned the estates of a relatively low area that is under 10 ha. An asymmetry as this is not typical only for Pyrzyce district. Taking into consideration the West Pomeranian voivodeship, the area structure in the years 1999-2005, in reference to the number of agreements, was dominated by estates smaller in size that is up to 10 ha.

A)



**Figure 4a. Single price and the area of the sold estate (hectare)**

For the general amount of 7.4 thousand of agreements of sales held in this time (without the transactions covering land under buildings, also the habitable ones, under separated objects, waters, fossil lands, and non-arable land), nearly one third (2 423 agreements – 32.7%) are agreements held for the purchase of estates up to 1 ha, and the following 3 109 agreements (42%) have been held for the purchase of estates in the range from 1 to 10 ha. In total, the bulk of agreements up to 10 ha made the 75% of the general of the held transactions for the purchase of estates. Due to this very reason, the analysis of the influence of the area on the single price has been performed with the division into area groups (Figure 4).



Source: research done by the author

**Figure 4b. Single price and the area of the sold estate (hectare)**

Also in this case, in order to exclude the eventual independence of the examined traits, a Chi-square test has been conducted. On the level of relevance  $\alpha = 0.01$  and the zero hypothesis claiming that both of the traits were independent ( $\chi^2 = 48.00391$ ,  $df = 4$ ,  $p = .00000$ ), has been rejected. In the enclosed figure, it may be observed, that the land of the smallest area reach the highest price level most often. A bit over three fourth of estates under 1 ha have been sold over 7 thousand PLN/ha. The level of probability is very low, and the C contingency index balances on the level of 0.44 for the maximum quality 0.816. This confirms the rule that, together with the increase of the sold area, the single price of the sold estate decreases. Nevertheless, the acquired results suggest that a large part of the sold estates has been purchased for extra-agricultural purposes.

## Conclusions

The agricultural real estate market is not unified. Two separate segments referring to the destinations of the purchased estates are very visible. A part of the arable land areas, sold in the public sector and in neighbour circulation, is destined for extra-agricultural purposes. This fact is certified by the estate prices sold by the State Agricultural Property Agencies, of the area not exceeding 1 ha on the given territory. These lands reached a price on the market, which may be compared to the price of lands destined for habitable construction of for commercial purposes.

Examining the relation between the single price, bonitation class, and the area of the sold estates from the SAPA, it may be observed, that in the majority of cases, the price is influenced more by the size of the sold acreage than the bonitation value. More often, the inhabitants of urban areas display the will to possess their "own" piece of land, which, taking into consideration the arable land price level is an attractive location of the capital, but also allows for living in a friendly environment more often.

Also the idea of a multi-functional development of rural regions will support in the future the increase in the demand for lands of extra-agricultural use. As is claimed by M. Kłodziński, "the diversification of village economy may proceed faster only with a bigger engagement of economic entities not associated with agriculture as such"<sup>16</sup>. Unfortunately, the lack of plans leads to a situation, where the object of trade in non-urbanized areas is, in the majority, arable land.

<sup>16</sup> Kłodziński M., 2005, *Dywersyfikacja gospodarki wiejskiej*. W: *Uwarunkowania i kierunki przemian społeczno-gospodarczych na obszarach wiejskich*. IRWiR PAN, Warszawa.

### **References**

1. Kaleta A., 1998, Rolnictwo i wieś europejska. Od korzeni ku współczesnej przyszłości w XXI wieku, UMK i IRWiR PAN, Toruń-Warszawa. Ostrowski I., 1996: Rynek ziemi rolniczej w latach 1991-1995. Stud. i Monogr. IERiGZ.
2. Kłodziński M., 2005, Dywersyfikacja gospodarki wiejskiej. W: Uwarunkowania i kierunki przemian społeczno-gospodarczych na obszarach wiejskich. IRWiR PAN, Warszawa.
3. Mejszelis M., 2006: Obrót nieruchomościami rolnymi na przykładzie powiatu pyrzyckiego, *Oeconomica* (45), nr 249, Zeszyty Naukowe Akademii Rolniczej w Szczecinie, Szczecin.
4. Poczta W., Rolnictwo polskie w przededniu integracji z Unią Europejską, Wydawnictwo Akademii Rolniczej w Poznaniu, Poznań.
5. Runowski H., 2002, Rozwój zrównoważony rolnictwa i gospodarstw rodzinnych. w: Wieś i rolnictwo – perspektywy rozwoju. IERiGZ, IRWiR PAN, SGH, Warszawa.
6. Strategia rozwoju województwa zachodniopomorskiego do roku 2020. Sejmik Województwa Zachodniopomorskiego, Szczecin 2005.
7. Wizja polityki zrównoważonego rozwoju obszarów wiejskich w rozszerzonej Europie (Raport europejskich ekspertów). „Wieś i Rolnictwo” nr 3, Warszawa 2004.

## Implementation Issues of Genetically Modified Organism's, the EU Policy and Development of Biosafety System in Latvia

Ligita Melece, Dr.oec., Head of Department, Latvian State Institute of Agrarian Economics,

[Ligita@lvaei.lv](mailto:Ligita@lvaei.lv)

Dina Romanova, Mg.biol., PhD student, assistant, Latvian State Institute of Agrarian Economics,

[Dina@lvaei.lv](mailto:Dina@lvaei.lv)

### Abstract

The paper presents results of the studies dedicated to the issues related to: 1) implementation of the European Union (EU) policy in the sphere of genetically modified organisms (GMOs) in Latvia, and 2) development of national biosafety system in accordance with the EU, and international legislation and recommendations, where the aim of system is to ensure the safe circulation of GMOs based on scientific risk assessment. An effective biosafety system covers divergent areas such as agriculture, food, feed, environment as well as health and education, and comprises extremely demanding administrative procedures including risk assessment. Environmental biosafety presumes that we have the ability to identify risks associated with GMOs, and thereby design the appropriate measures to minimise or negate these risks. The paper describes the research results of acting Latvia's biosafety system with the analysis of the key elements: national policy, regulatory system or legislation and institutional system, inter alia research and scientific capacity. The main conclusion is that on the whole the system has been developed in accordance with the EU and international requirements, but still a lot of effort is required for the system improvement and increasing its capacity. Therefore the paper suggests possible ways to improve this system and to make it more efficient.

**Key words:** biosafety system, genetically modified organisms

### Introduction

At present the information about genetically modified organisms (GMOs) more often appears in the public space of the European Union (EU), where in the regulatory enactments GMOs are defined as:

- organism, with the exception of human beings, in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination<sup>17</sup>;
- any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology<sup>18</sup>.

GMOs may be plants, animals or most commonly micro-organisms (including bacteria, viruses parasites and fungi).

The products arising from modern biotechnology provide new opportunities to achieve sustainable productivity gains in agriculture (McLean M.A. et al., 2002). Concerns over their possible environmental and health implications stimulated regulatory mechanisms for food safety and environmental risk assessment.

The concept of biosafety was developed and the establishment of a regulatory framework to ensure human and environmental safety has become essential to biotechnology development<sup>19</sup>. Environmental biosafety is environmental protection attained by the adoption and implementation of policies and procedures that assess, evaluate and mitigate the potential of GMOs to cause unacceptable ecological change. Environmental biosafety presumes that we have the ability to identify risks associated with GMOs, and thereby design the appropriate measures to minimise or negate these risks. World Conservation Unit<sup>3</sup> (IUCN) stressed that there are two opposing views to this - one says, we have very limited experience, we never know the risks, and therefore let us reject GMOs, but the other says there are too many opportunities that it might work, let us proceed, put in the necessary precaution and learn/change as we go along.

Over the past two decades, national biosafety frameworks, guidelines, and regulatory systems have often been implemented on a "piece-by-piece" basis in response to the demands or urgent needs of the

---

<sup>17</sup> Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC

<sup>18</sup> Cartagena Protocol on Biosafety to the Convention on Biological Diversity

<sup>19</sup> [http://www.genecampaign.org/new\\_bio-policy-re/SaturninaHalos.pdf](http://www.genecampaign.org/new_bio-policy-re/SaturninaHalos.pdf)

moment. Ideally, a biosafety system would be developed from a comprehensive plan. However, building such a system and making it operational is complicated by the fact that there is neither single best approach nor standard that reflects national environmental, cultural, political, financial, and scientific heterogeneity.

The review of literature shows that two positions exist – 1) positive and advantages point of view for GMOs use, particularly of GM crops, and 2) negative standpoint, which stressed the threats of GMOs and GM crops through uncontrolled and unlimited introduction of them in the environment or market (Bakshi A., 2003; Brookes G., Barfoot P., 2006).

IUCN<sup>20</sup> recognized that therefore in society we can find different opinions about GMOs, because part of the society consider that GMOs is an instrument, how to increase the scale of food production without the need to convert more land to cultivation, but others think that GMOs may have a variety of impacts on people and animals, and especially on ecosystems and lands not under cultivation.

The European Commission<sup>21</sup> (EC) notes that new technologies of genetic modifications open wide opportunities for improving traits of crops and animals and their nutritional value in the interests of consumers. The EC also emphasizes that the development of modern technologies is an important tool to encourage the economic growth and competitiveness as well as create new work places.

The modern biotechnology offers large opportunities to improve human's welfare. However, these opportunities may be provided only when biotechnology is developed and used considering appropriate safety measures in relation to the environment and human's health, as using of GMO is associated with certain risk<sup>22</sup>.

Therefore, the establishment of an effective national biosafety system is critical to ensure a high level of environment and human health protection, to increase public confidence in the control of biotechnology, and to set a clear legal framework for research organizations and industry. Moreover, in establishing national biosafety system, international agreements and standards should be considered.

The **aim** of this paper is to estimate the implementation issues of the EU GMO policy and development of national biosafety system in Latvia.

The following **objectives** for achieving the set aim were defined:

- to analyse acting legislation, institutional, administrative and financial capacity and compliance with the EU and international statements in Latvia;

- to work out the proposals for the improvement (normative, institutional, administrative, scientific and financial funding, surveillance, risk assessment and management etc.) of national biosafety system.

For studies various **materials** were used such as: normative basis of the EU and Latvia; scientific publications and reports, guidelines, methodologies and reports of international organizations and institutions; information from the MoA and MoE information obtained from consultations with governmental and non-governmental organizations.

For solving the defined tasks the adequate research **methods**: analysis, data grouping, reference, logical and abstract constructive, and expert methods etc., were used.

## **Results and discussion**

### **1. Latvia's National biosafety system**

The development and implementation of an effective national biosafety system is important for several key reasons: to ensure safe access to products of modern biotechnology; to build public confidence; to encourage the growth of domestic modern biotechnology, and to comply with international standards and agreements (McLean M.A. et al., 2002). There is no single best approach in the development and implementation of a national biosafety system and each country is faced with unique challenges.

---

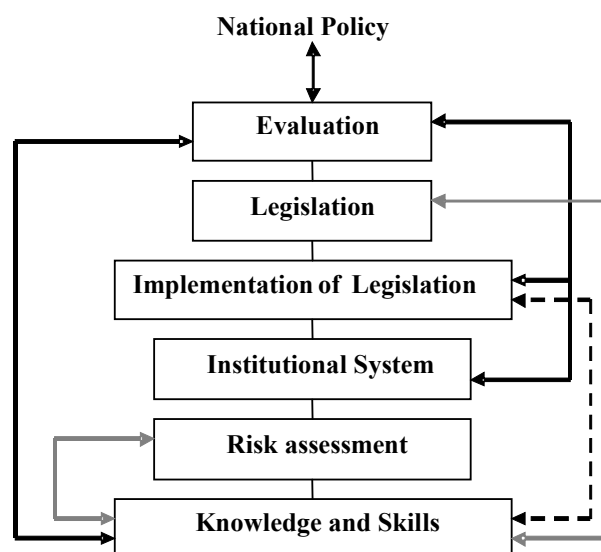
<sup>20</sup> Genetically Modified Organisms and Biosafety: [http://www.iucn.org/bookstore/HTML-books/PGC1-genetically\\_modified\\_organisms/cover.html#fn1](http://www.iucn.org/bookstore/HTML-books/PGC1-genetically_modified_organisms/cover.html#fn1)

<sup>21</sup> The mid term review of the Strategy on Life Sciences and Biotechnology COM/2007/0175 final, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0175:FIN:EN:HTML>

<sup>22</sup> ) Genetically Modified Organisms and Biosafety: A background paper for decision-makers and others to assist in consideration of GMO issues. - [http://www.iucn.org/bookstore/HTML-books/PGC1-genetically\\_modified\\_organisms/cover.html#fn1](http://www.iucn.org/bookstore/HTML-books/PGC1-genetically_modified_organisms/cover.html#fn1)

Notwithstanding that Latvia is a small country and a new EU member state, the national biosafety system has been developed and implemented in accordance with the international and EC statement, where the key elements of system are: biosafety policy, legislation and institutional system.

The process of development, establishment and implementation of a national biosafety system is shown in a schematic way (Figure 1), where the system needs continuous improvements.



Source: author's modification from McLean M.A. et al., 2002

**Figure 1. Scheme of biosafety system development and implementation**

A national biosafety framework is a combination of policy, legal, administrative and technical instruments that are developed to ensure an adequate level of protection in the field of the safe transfer, handling and use of GMOs resulting from modern biotechnology (McLean M.A. et al., 2002; Milavec M. and Racman D.S., 2007; Nap J.P. et al., 2003) that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health<sup>23</sup>.

Scientific risk assessment is the cornerstone of biosafety regulatory systems (McLean M.A. et al., 2002) and public-policy decisions related to the safety and acceptability of GMOs<sup>24</sup>, int al. GM crops.

Human resource development is a very important aspect too for doing research and development work in the field of biotechnology as well as to launch public awareness programme for increasing knowledge in risk assessment and benefit of biotechnology.

### 1.1. Biosafety policy

McLean M.A. et al. (2002) thought that, ideally, the evolution of a national biosafety system begins with the elaboration of a national policy consistent with other policy objectives related to food, agriculture, the environment, and sustainable development and biosafety policy articulates a national approach to biosafety regulation, and the goals and objectives of the regulatory framework.

The development of a national biosafety policy in Latvia was initiated in 2000 by the Latvian Food centre. Latvia has not defined the issues, where the national biosafety policy would differ from the general EU biosafety policy, and in line with this EU policy Latvia is a party to the Convention on Biological Diversity, Cartagena Protocol on Biosafety and Aarhus Convention.

Presently the biosafety policy in Latvia is a part of wider policies in the field of the environmental protection, biodiversity conservation and food safety. State environmental policy is formed on the basis of the following internationally recognized principles of the environmental protection: the principle of

---

<sup>23</sup> National Biosafety Framework. [http://www.doe-bd.org/bangladesh\\_nbf.pdf](http://www.doe-bd.org/bangladesh_nbf.pdf)

<sup>24</sup> <http://www.biosafety-cee.org>

sustainable development, the “polluter pays” principle, the precautionary principle, and the assessment principle.

However analysing the current Latvia’s state position and decisions in the sphere of GMOs we came to the conclusion that not always basing on the scientific risk assessment, which, due to the lack of financing regulatory according to the European Food Safety Authority (EFSA) and other international organizations, was one of the main elements in developing effective national biosafety policy and was highly recommend to perform. McLean M.A. et al. (2002) indicate that in the process of development of national biosafety policy, it is necessary to clearly define national priorities that are based on scientific substantiations – risk analysis. Therefore the EU member states national biosafety policy, for instance Germany, Denmark, the United Kingdom, Spain, is based on detailed risk analysis, which consists of several main elements – risk management decision, risk assessment, and risk communication.

In general the analysis of situation showed that Latvia as a state with an open market economy and being a member of the EU favoured the development and safe use of modern biotechnology. However the existing national biosafety policy is incomplete, and therefore there is a need to improve its effectiveness by defining national priorities regarding the use of modern biotechnology products in agriculture and food/feed industry and establishing mechanism for scientifically based risk assessment and management.

## **1.2. Legislation**

Latvia ratified the Convention on Biological Diversity (CBD) on 8 September 1995 in order to ensure conservation and sustainable use of the country’s rich biological diversity and accordingly, the Cartagena Protocol on Biosafety (CPB) on 22 January 2004 had been ratified. Smal M. et.al. (2006) considered that biosafety laws and regulations had been developed in response to the implementation of the CPB and stressed that biosafety regulatory processes were precautionary by definition.

After Latvia’s accession to the EU it adopted all the EU legislation, inter alia in the field of biosafety and GMOs. In the EU the GMs regulatory system is composed of several regulations, directives and amendments thereof, that are assembled in a time-consuming and highly complex interplay between the European Commission (EC), the European Parliament (EP), the relevant Council of Ministers and individual Member States.

Latvia’s legislation in the sphere of GMOs and biosafety consists of binding international treaties and relevant EU and national normative acts, like the experience of other EU member states (Milavec M., Racman D.S., 2007; Sanvido O. et al., 2006). The provisions of international treaties, EU directives and other EU legislative acts, which are not directly applicable, are implemented into the national legislation. The EU regulations are directly applicable in Latvia, and relevant national legislation may not regulate the same aspects of GMOs and biosafety issues.

The main legal acts in Latvia on biosafety; environmental protection and food safety are the following:

- Environmental Protection Law (adopted on November 29, 2006 with amendments of July 19, 2007);
- Plant Protection Law (adopted on December 17, 1996. with amendments of January 1, 2007);
- Law on the Supervision of the Handling of Food (adopted on February 19, 1998 with amendments of January 1, 2007);
- Cabinet Regulations No. 189 Labour Protection Requirements when Coming into Contact with Biological Substances” of May 21, 2002 “.

Currently the main legal acts, which directly regulate GMOs sphere in Latvia is:

- Law “On Circulation of Genetically Modified Organisms” (passed on December 5, 2007). The necessity of adoption a new version of Regulations which could replace the existing “Regulations Regarding the Contained Use and Deliberate Release into the Environment and Placing on the Market of Genetically Modified Organisms, as well as “Procedures for the Monitoring Thereof” by December 1, 2008 have been fixed by the above mentioned law;
- Cabinet Regulations No. 333 “Regulations Regarding the Contained Use and Deliberate Release into the Environment and Placing on the Market of Genetically Modified Organisms”, as well as “Procedures for the Monitoring Thereof” of April 20, 2004 (with amendments of January 10, 2006).

However, considering that the Regulations No. 333 were elaborated in relatively short term, there exist several shortages, for instance, there are no requirements ensuring co-existence of genetically modified crops, as well as there is lack of requirements for public information and its participation in the decision making process, which arises from Directive 2001/18/EC and Directive 90/219/EEC.

### 1.3. Institutional system

Many researchers (Matzk A., Bartasch D., 2006; Gathmann A., Bartsch D., 2006) recognized that an effective national biosafety system could be very complex, with the involvement of several competent authorities. Either in Latvia the institutional system that is responsible for biosafety, the implementation of GMOs policy and for handling notifications and requests for GMOs use and/or authorisation, which is based on the relevant EU regulations and the national legislation drafted on the basis of the EU directives, is quite complex.

The main institution responsible for legislation elaboration in the area of GMO is the **Ministry of Agriculture** (MoA). Considering that presently in Latvia there is no advisory institution that could coordinate the elaboration of national biosafety policy, the MoA in the process of elaboration legislative acts cooperates with the MoE, the Ministry of Welfare and Ministry of Health, as well as with different scientific and non-governmental organizations.

In accordance with the Regulations No. 333 competent institutions that are responsible for handling notifications and requests for authorisations are the following:

- **Food and Veterinary Service - FVS** (an institution subordinated to the MoA) is responsible for handling notifications and requests for authorisations with respect to the contained use of GMO, placing on the market GMO and derived products;
- **Nature Protection Board** (an institution subordinated to the MoE) is responsible for handling notifications and requests for authorisations with respect to deliberate release of GMO into the environment.

The Regulations No. 333 establish the following institutions that perform the functions of the state supervision and control of GMO use and distribution:

- Food and Veterinary Service;
- State Plant Protection Service;
- State Environmental Service;
- State Labour Inspectorate.

Main non-governmental organizations that are involved in the elaboration of legislation and decision-making are: Latvian Society of Geneticists and Selectionists; Environmental Advisory Committee; Cooperation Council of Agricultural Organizations.

The following research institutions in Latvia implement fundamental and applied researches in the field of GMOs and their risk assessment, in al. post-market monitoring issues, for instance, the evaluation of baseline indicators:

- University of Latvia, Institute of Microbiology and Biotechnology;
- University of Latvia, Faculty of Biology;
- University of Latvia, Institute of Biology;
- Latvia University of Agriculture, Institute of Soil and Plant Sciences;
- Latvian Biomedical Research and Study Centre;
- Latvian State Centre of Plant Protection.

In general the existing institutional system in Latvia is completely developed, but to ensure its effectiveness there is a need to build capacity of institutions responsible for handling notifications, as well as controlling and research institutions.

## 2. Recommended improvements of biosafety system

### 2.1. National biosafety policy and legislation

For ensuring effective biosafety policy several proposals have been made with the main proposals as follows:

- 1) allocation of funding from the state budget for GMO risk assessment and research, particularly for cost-benefit analysis of GM crop cultivation (until now there is lack of finances for these purposes);
- 2) establishment of GMO Monitoring Council;
- 3) development of risk assessment and management system.

Within this system we suggest that the functions of coordinating institution shall be implemented by the FVS (Food Centre) performing the following tasks:

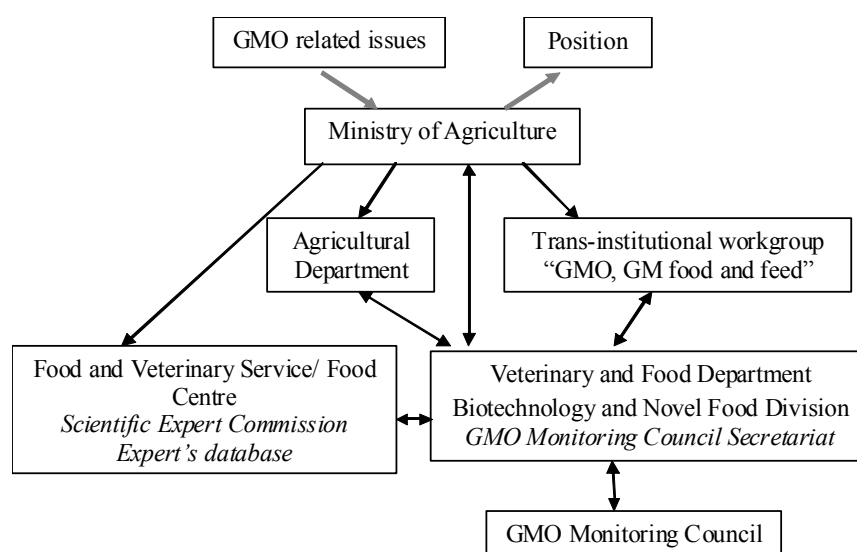
- to be the Secretariat of Scientific Expert Commission;
- to develop and keep experts and research database;



- to collect and analyse data with the purpose to monitor and assess GMO related risks that have direct or indirect impact on human, animal health and environment;
- to collaborate with scientific institutions and experts, give scientifically based opinion on products containing GMO;
- to promote and coordinate scientific research on indicators necessary for GMO risk assessment;
- to collaborate with other EU competent authorities in joint network.

For improving legal basis in GMO area and providing better collaboration between competent institutions, we suggest that the elaboration of normative acts should be concentrated in one central institution, like, Veterinary and Food Department (VFD) of the MoA.

Several governmental and non-governmental institutions are involved in GMOs strategy and policy development, but only the VFD is responsible for many GMOs related issues, we propose the following mechanism (Figure 2) for the preparation of Latvia's GMOs policy and position, where the VFD could play the central role.



Source: made by the authors

**Figure 2. Mechanism for the preparation of Latvia's GMOs policy and position**

In the process of elaboration laws and regulations, and preparation of the position VFD should consult with Food Centre, Scientific Expert Commission, GMO Monitoring Council, trans-institutional workgroup, Agricultural Department of the MoA and non-governmental institutions.

## 2.2. Recommended improvements for capacity building

The authors have worked out some suggestions, proposals and recommendations for building Latvia's institutional, scientific and technological capacity.

For capacity building of institutions which are responsible for handling notifications and requests for the authorization we propose the following future needs:

- to improve the knowledge of experts in the field of biosafety and risk assessment;
- to elaborate effective methodical skills, and to improve the knowledge quality at different levels of the authorization process;
- to review the financial resources allocated for expertise in the process of risk assessment;
- to work out technical guidance for applicants explaining the application procedure and authorisation process.
- While for the capacity building of supervision or control institutions, which perform control of GMOs in practice it could be advisable to perform the following measures:

- to work out guidance notes and manuals for inspectors, and implement informative and educational activities on GMO issues;
- to elaborate effective methodical skills, and to promote the knowledge quality at different levels of monitoring and controlling processes;
- to improve material resources for expertise in the process of control on GMO use;
- to develop infrastructure for GMO detection and also facilities for assessment/ evaluation.

The scientific and research potential or capacity of Latvia's research institutions is sufficient but for several reasons it is not used completely due to:

- the lack of public procurement, and therefore the financing;
- incomplete coordination between different research institutions.

For different kind of research, for example, research connected with co-existence of GM crops with conventional and organic agriculture, and post-market monitoring after introduction of GM crops, the comprehensive analysis of different factors is required, and for this the consortium of several research institutions could be developed, where the participation of experts that represent different scientific fields, e.g., biotechnology, molecular biology, agronomy, plant protection, plant physiology and pathology, entomology and microbiology etc. is needful.

### **Conclusions**

The result of studies showed that the present Latvia's biosafety system with the following key elements: national policy, regulatory system or legislation and institutional system, inter alia research and scientific capacity, has been developed in accordance with the EU and international requirements, guidelines and recommendations, but still a lot of effort is required to improve its capacity and management.

To ensure effective implementation of national biosafety policy, it is necessary to strengthen institutional mechanisms for oversight and control use of GMOs, and to allocate the funding for development of scientific based risk assessment.

Latvia's legislation in the sphere of GMOs and biosafety consists of international treaties and relevant EU and national regulatory enactments, but it is necessary to make improvements in several regulations, particularly in the field of co-existence of GM crops with convention and organic agricultural practice.

Latvia's institutional system, which is responsible for biosafety system, the implementation of GMOs policy and for handling notifications and requests for GMOs use and/or authorisation is more or less developed, but for ensuring its effective operation and effectiveness it is necessary to build the capacity of institutions connected with risk assessment, and institutions that are responsible for handling notifications.

### **References**

1. Bakshi A. (2003) Potential Adverse Health Effects of Genetically Modified Crops. *Journal of Toxicology and Environmental Health*, Part B, 6, p. 211-225.
2. Brookes G., Barfoot P. (2006) GM Crops: The First Ten Years - Global Socio-Economic and Environmental Impacts. ISAAA Brief 36, PG Economics Ltd., United Kingdom.
3. Gathmann A., Bartsch D. (2006) National coordination of GMO monitoring – a concept for Germany. *Journal für Verbraucherschutz und Lebensmittelsicherheit*, November 2006. p. 45-48.
4. Linacre N., Falck-Zepeda J., Komen J., MacLaren D. (2006). Risk Assessment and Management of Genetically Modified Organisms under Australia's Gene Technology Act. *Environment and Production Technology Division* October 2006. EPT Discussion Paper 157. <http://www.ifpri.org/divs/eptd/dp/papers/eptdp157.pdf> (assessed on 1.12.2007)
5. Matzk A., Bartasch D. (2006) Report of Working Group 1: Regulation and Organisation. *Journal für Verbraucherschutz und Lebensmittelsicherheit*, November 2006: 53-54
6. McLean M.A., Frederick R.J., Traynor P.L., Cohen J.I. (2002). A conceptual framework for implementation biosafety: linking policy, capacity and regulation. Briefing paper 47. International Service for National Agricultural Research, The Hague.
7. Milavec M., Racman D.S. (2007) Experience from the implementation of biosafety system in Slovenia. *Biotechnology Journal* 2007, 2: 1093-1104
8. Nap J.P., Metz P.L., Escaler M., Conner A.J. (2003). The release of genetically modified crops into the environment. *The Plant Journal*, Vol. 33 Issue 1, pp. 1-18.
9. Smale M., De Groote H. and Falck-Zepeda J. (2006). Biosafety and Biodiversity Risks. Biosafety Regulations, Brief 26, International Food Policy Research Institute. [http://www.ifpri.org/pubs/rag/br1004/br1004\\_26.pdf](http://www.ifpri.org/pubs/rag/br1004/br1004_26.pdf)

## Food Consumption Trends and its Influencing Factors in Latvia

*Dr.oec.* **Ligita Melece**, Head of Department, ligita@lvaei.lv

*Mg. biol.* **Dina Romanova** PhD student, assistant

**Aleksandrs Golovčenko**, assistant

Latvian State Institute of Agrarian Economics

### Abstract

Over the last decade the structure of consumption expenditures, including food, in Latvia like other developed countries and countries in transition has changed significantly, affecting accordingly also food consumption patterns and diet habits. The paper presents the results of studies on factors influencing food consumption and diet of Latvia's inhabitants and food consumption trends. The study provides the evaluation and comparison for the consumption of various food products and their nutritive value for food intake or diet by Latvian urban and rural inhabitants, as well as by the inhabitants of different regions of Latvia. The study results show that the consumption of basic food groups – bread and cereal products, meat and meat products, milk and milk products – and fats has changed over the last 15 years. The consumption of meat and milk products is constantly increasing, whereas the role of this group of products in urban residents' diet is larger than for rural ones. Bread and cereal products as well as fats still play a quite important role in energy balance for the lowest income group of inhabitants, including rural ones. Quantities and qualitative aspects of consumed food in different regions of Latvia as well as in urban and rural areas are evaluated. The relationship between the choice of several food groups and population income and its changes is evaluated, and the results show that the main factor influencing nutrition or diet of the population of Latvia depends on the income per capita.

**Key words:** food consumption, income, region, urban, rural

### Introduction

Within the last decade the structure of households' consumption expenditure has changed significantly. In all European countries, the share spent on food and beverages has declined. AN Austrian study (Pack et.al., 2005) has pointed out that high income countries spend only 16% of their expenditures on food, while low income countries spend 55%. According to the data from the Central Statistical Bureau (CSB) of Latvia, a Latvian household spends 28% of its expenditure on food and non-alcoholic beverages. In comparison with 2005 the expenditure on food has decreased by 3%.

Pack et.al. (2006) indicate that changes in the structure of households' consumption expenditures have influenced food consumption patterns worldwide both in industrialised countries like the European Union (EU) and other developing countries. General trends show that:

- meat consumption raises annually, especially pork and poultry;
- households begin use more vegetable oils and to avoid animal fats;
- strong decline in the consumption of potatoes and dairy products (except cheese and fermented products) is observed;
- additional increase can be seen in higher consumption of fast food, pizzas and pastas, as well as juice, mineral water and carbonated soft drinks;
- shift in diets towards more livestock products and vegetables can be recognized.

Michaelis L. and Lorek S. (2004) highlight that a wide range of demographic, social, technological and economic trends and factors is shaping household consumption in Europe, for instance:

- families and households are shrinking;
- population is aging;
- time spent on activities such as cooking is falling, in favour of leisure and entertainment.

In investigation of food consumption patterns two broad approaches can be used: one dealing with household food consumption based on budget surveys, and the other one analysing the effects of socio-economic differences on food consumption. For assessing food consumption patterns in Latvia only one of these approaches can be used – household food expenditure, since there is a lack of adequate surveys providing quantitative and qualitative data for analysing socio-economic factors.

The **aim** of this study is to estimate food consumption trends and influencing factors in Latvia.

The **object** of the research is food consumption and its trends, inter alia consumption of different groups of products, and diet of inhabitants of rural and urban areas as well as different regions.

The study includes some **tasks**: factors influencing food consumption; structure of inhabitants' expenditures and share of food in total expenditures; food consumption trends; dependence of food consumption and diet on the location of household (urban and rural, regions of Latvia).

The key **materials** used for studies are as follows: different sources of literature, research papers and reports of international organizations, published and unpublished data from the Central Statistical Bureau of Latvia (CSB) as well as the database (2003 – 2005) of Household Budget Survey done by the CSB.

Both qualitative and quantitative research **methods** were used in this study: analysis, data grouping, and reference, logical and abstract constructive and expert methods.

The analysis methods include: ratio analysis, historical trend analysis, and linear regression analysis by means of the software tools.

The norms of chemical content of products by Souci, S.W. et al. (1994) have been used for calculations of nutrition value of food products. Due to the limited scope only the most important results of the research are set out in the paper.

### **3. Results and discussion**

#### **3.1. Food consumption and its influencing factors**

Human motivation to consume is often described in the language of needs, wants and desires. While some need is founded entirely in individual physiology, many of our needs result from the interaction with our social context. Michaelis L. and Lorek S. (2004) indicated that consumption was one of the realms in which it was most obvious that behaviour was established at least in part by the social context. The social influence takes place at many different levels, within households and organisations, in local communities and cities, in nations and internationally. Besides media is a major part of the social influence on consumption (Michaelis, Lorek, 2004). Also in Latvia television and advertisement plays an increasingly strong role in food consumption, for instance, chips and soft drinks play an important role in daily consumption for schoolchildren.

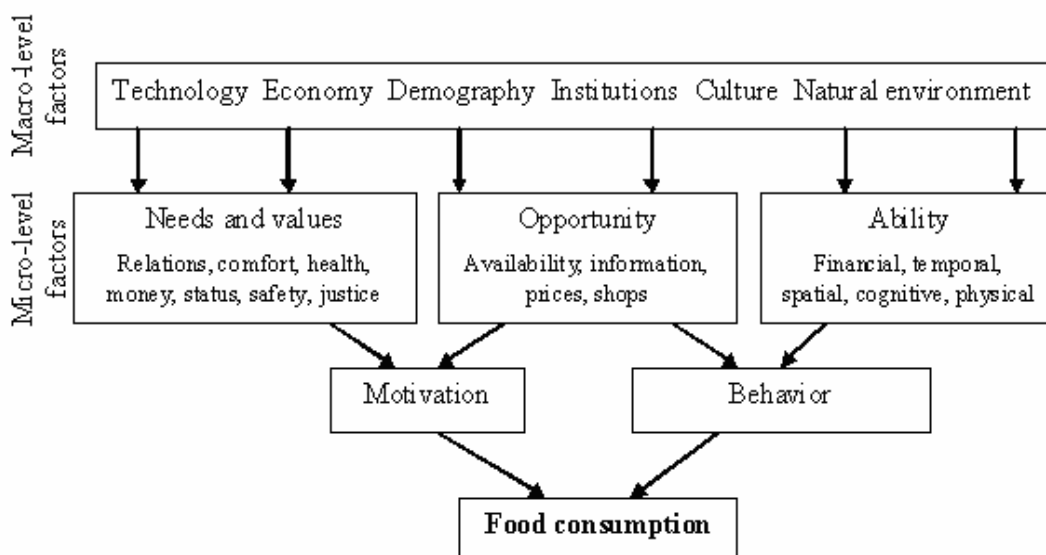
Gehlhar M. and Coyle W. (2001) claimed that shifts in consumption could have major impacts on food markets, including exports and imports. Therefore it is substantially to clarify the major determinants of changes in the structure of food consumption patterns.

Numerous publications and case studies about various factors influencing food consumption and dietary habits can be found in different sources of literature. Some authors outline that food consumption depends on the economic and social structure of a country, its environment, climate, resources and trade policies, as well as the composition, culture and lifestyle of its population (Akabay et.al., 2007). While other authors point out that the demographic factors, such as shifts in the population growth, age structure, urbanization and changes in household size can bring changes in food consumption structure (Putnam, Allshouse, 1999).

Schmidhuber J. (2003) identifies several other factors determining the form and the pace of these nutritional transitions: food industry and state intervention (promotion of animal husbandry); socio-economic transformations bringing changes in women's roles (different time allocation promoting processed foods); changes in public understanding on the role of diet for health (a factor with potential for very positive developments, but also one producing dubious results in population searching for alternative healing through nutrition); and effects of growing international trade and globalisation of tastes.

In the study performed by Gehlhar M. and Coyle W. (2001) different economic factors were identified and the shifts in consumption patterns explained, where economic factors contain the growth of income and food expenditures, factors of production, transport costs, and trade policy changes. Of these determinants, the growth of income and its impact on food consumption was determined as most important to explain the changes in food consumption patterns. At the same time these authors indicate that consumption patterns are a function of many factors, and not always directly related to income changes. They can relate to the changes in lifestyle, and can lead towards greater food purchases away from home, thus reducing preparation costs. As this occurs some food commodities may experience not only a decrease in the share of food expenditure, but also an absolute decline in per capita consumption.

Overall factors influencing food consumption can be divided into macro-level and micro-level driving factors (Figure 1).



**Figure 1. The factors affecting food consumption on macro-level and micro-levels**

Source: made by the authors based on Pack et.al., 2005

According to Pack et.al. (2005) macro-level factors are equal for all individuals, and refer to the natural and human environment people live in, and they include the following developments:

- technical - the growing supply of goods and services;
- economic - increasing disposable income for households;
- demographic - the growing population and its growing demand for more goods and services;
- institutional - the free market system;
- cultural - the belief of people that they feel better by consuming more.

The macro-level factors affect the individual's consumption habits by influencing the micro-level driving factors. Those differ between human beings and include human needs and values, behavioural opportunities, consumer abilities and consumer uncertainty. Needs and opportunities determine the motivation for consuming, whereas opportunities and abilities are responsible for the behavioural control, i.e., the feasibility of consumption. Needs are internal forces that are responsible for our behaviour, like physiological needs (hunger, thirst), safety needs, needs for subsistence, communication, leisure, freedom, etc. If a non-satisfied need was confronted with an opportunity, which is able to satisfy the need, this would result in a motivation to use that opportunity. Figure 1 summarises the main factors that influence consumer decisions and food consumption.

Summarising the information and data on the factors influencing food consumption we come to conclusion that in earlier period of development of the state int.al in transition like Latvia at present, it is indicated that per capita income level is the most important factor affecting food consumption patterns, but with the growth of income level and further development of the state it has been proved that other factors would be important for affecting food consumption patterns.

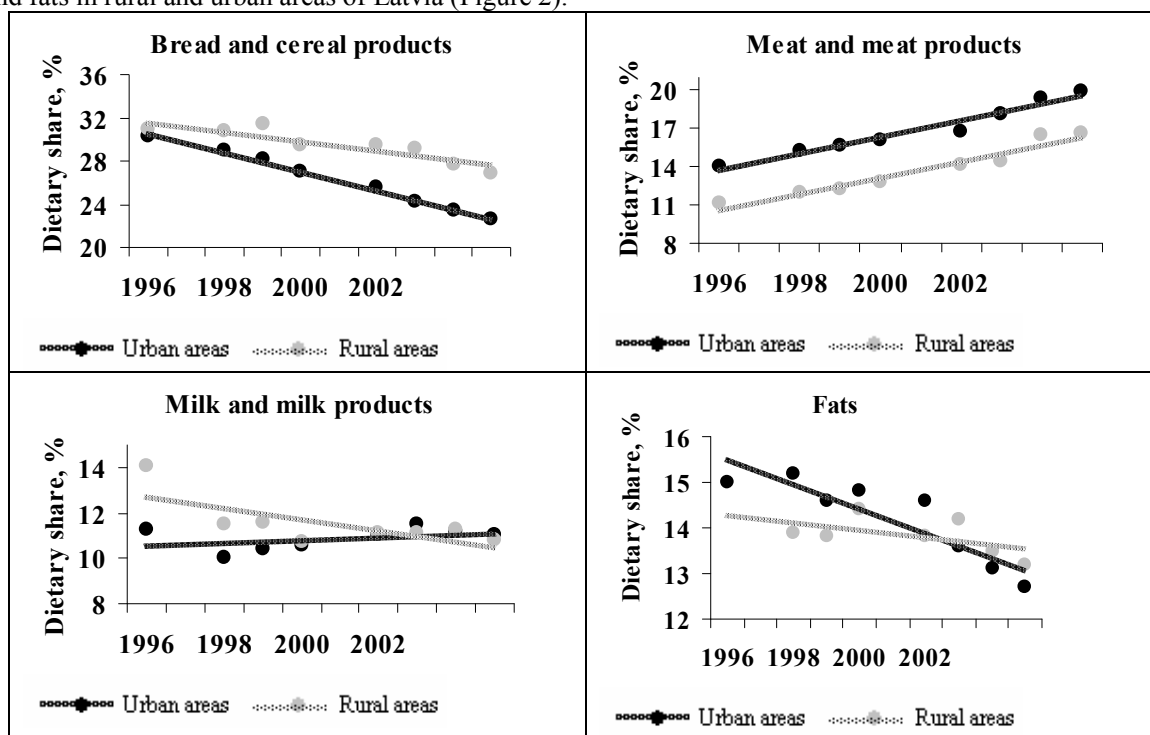
### 3.2. Food consumption in urban and rural areas

At present in compliance with the data from the CSB of Latvia 68 per cent of the total population of Latvia live in cities and towns, while 32% - in rural areas. Therefore, we can agree to the International Food Policy research institute (IFPRI),<sup>25</sup> which indicates that no developing country can afford to ignore the phenomenon of urbanization. In this relation B. Cohen (2006) taught that the major force altering the food

<sup>25</sup> Annual report 2006 – 2007. <http://www.ifpri.org/pubs/books/ar2006/ar06.pdf>

equation was shifting rural-urban population and the resulting impact on expenditure and consumer preferences.

For evaluating the impact of urbanisation on food consumption pattern we compared the consumption of three basic food groups – bread and cereal products, meat and meat products, milk and milk products – and fats in rural and urban areas of Latvia (Figure 2).



Source: author's calculations based on the data of the Central Statistical Bureau

**Figure 2. The dietary share of basic food groups (in calorie equivalents) of Latvian urban and rural population between 1996 and 2005, %**

According to the research results the role of bread and cereal products in energy balance from 1996 to 2005 has decreased annually both in the dietary of urban and rural population. For rural inhabitants this decline was not so rapid – from 30.9 per cent in 1996 to 26.9 per cent in 2005, but still bread and cereal products are an important component in the dietary of rural inhabitants. Differences in bread and cereal product consumption among rural and urban population can be explained with different level of income. According to the results of other researches bread consumption is conversely to the income level<sup>26</sup> of population (The Federation of Bakers, 2005).

Conversely to bread and cereal products the consumption of meat and meat products can be characterised as steadily increasing. For example, if in 2003 the total annual meat and meat products consumption was 73.8 kg per inhabitant, then in 2005 it amounted to 81.5 kg. Rising level of consumer income and meat prices, when adjusted to the inflation, explain much of the increase in meat consumption. The comparison of meat consumption between urban and rural population shows that urban population consumes more meat and meat products than rural inhabitants.

Similar results are found in the studies of other researchers (Akabay et.al., 2007; Aragrande M. et al. 2005) where the highest expenditure elasticity was found for meat and meat products group, suggesting that its demand will grow faster than the demand for other products as the economy develops and income increases. According to the statistical data (CSB) total consumption of milk and milk products in recent years has decreased - in 2003 it was 335 litres per inhabitant, but in 2005 it was only 324.3 litres. Assessing these changes over 15 years between two different groups of inhabitants we can observe two tendencies: the share of milk and milk products in urban population dietary increases annually, while in rural population dietary it

<sup>26</sup> <http://www.bakersfederation.org.uk/resources/FS3%20-%20UK%20Bakery%20Market.pdf>

decreases. These differences can be explained by the fact that consumption of several milk products, like yoghurt, fermented milk products and cheese, which play an important role in urban population dietary, increases steadily and rapidly.

Positive tendency can be observed when assessing the consumption of fats over the period of 15 years – it has decreased annually and among urban inhabitants this process has occurred faster. This analysis shows that the inhabitants of Latvia are starting to think healthier by choosing foods and drinks naturally low in fat, as well as the fast-growing array of processed reduced-fat and non-fat foods and drinks.

Overall assessment on the consumption of different food groups in rural and urban areas may lead to the conclusion that there are differences in food dietary among rural and urban population, but these differences are not considerable. Constantly the role of meat and meat products, and milk and milk products increases in the dietary of urban population, while bread and cereal products and fats still have a quite important role in energy balance in the dietary of rural population.

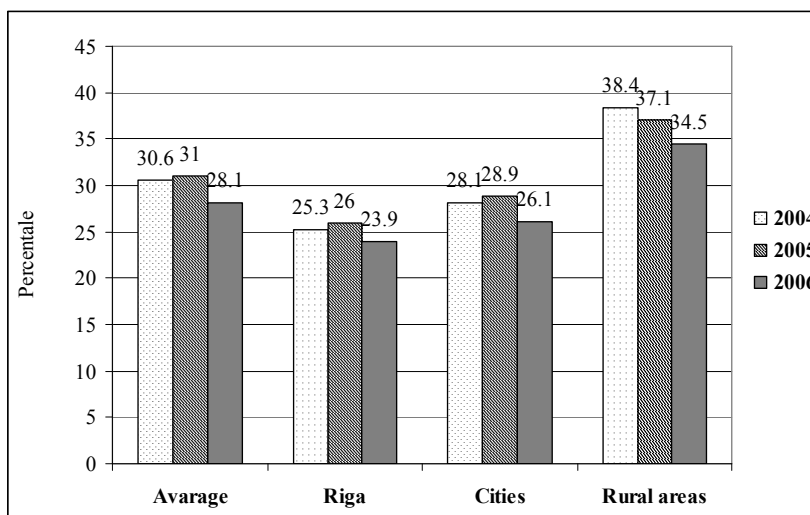
Table 1

**Income of urban and rural population by cash and type between 2003 and 2005, LVL per household member per month,**

Year	Urban, LVL per month			Rural, LVL per month			Urban / Rural, %	
	total	in cash	in kind	total	in cash	in kind	total	in cash
2003	98.46	94.79	3.69	62.61	52.66	9.95	157%	180%
2004	112.34	107.55	4.79	77.84	67.55	10.29	144%	159%
2005	121.66	116.50	5.16	86.36	76.22	10.14	141%	153%

Source: author's calculations based on the data of the Central Statistical Bureau

Comparing the income level of urban and rural population in Latvia (Figure 3) we concluded that it differed considerably. For example, in 2005 the income level of urban population was 1.4 times higher than the income level of rural population (Table 1). Therefore we can agree to researchers which affirm that higher income and dependable food supplies, lead to the diversity in diets, both in the type of foodstuffs consumed and their source<sup>27</sup>.



Source: figure made by the authors based on the data of the Central Statistical Bureau

**Figure 3. The share of expenditures for food in different areas of Latvia in the period 2004-2005**

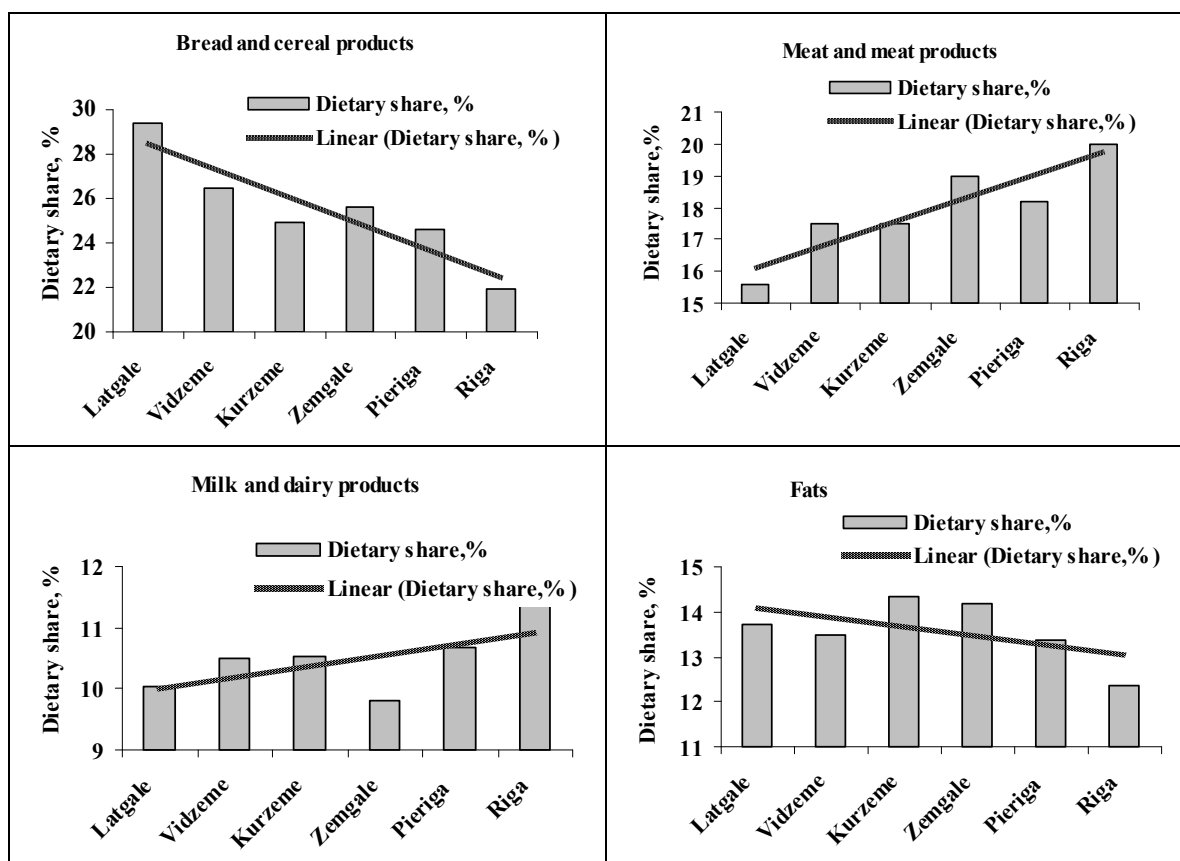
<sup>27</sup> Global and regional food consumption patterns and trends. – [http://www.who.int/nutrition/topics/3\\_foodconsumption/en/print.html](http://www.who.int/nutrition/topics/3_foodconsumption/en/print.html)

With increasing number of urban population in Latvia we forecast that more convenience and processed foods will appear in the dietary of population, as urban occupations raise the opportunity costs of time needed to prepare meals.

### 3.3. Food consumption in different regions of Latvia

For evaluating regional trends we compared food consumption in different regions of Latvia. As well as in urban and rural areas we estimated the consumption of three basic food groups— bread and cereal products, meat and meat products, milk and milk products – and fats (Figure 4).

Describing the consumption structure we can see that the inhabitants of Latgale with bread and cereal products take on average 29% calories (in comparison with the inhabitants of Riga, which take only 22% calories with bread and cereal products). The inhabitants of Latgale in their dietary use considerably more cereal products than the inhabitants of Riga: 2.6 times more rye bread, 2 times more grouts, and 2.3 times more wheat meal and for 80% more macaroni products. All these products are rich in carbohydrates, and ensure high food caloric value. As more than one third of Latvian population lives in Riga and Pierīga, and the income level in these regions is considerably higher than in other regions (Table 2), the inhabitants of Riga and Pierīga regions consume more meat and meat products, and milk and milk products. But in the regions where the income level of population is low – Latgale, Vidzeme, Kurzeme – bread and cereal products and fats are the main products consumed.



Source: author's calculations based on the data of the Central Statistical Bureau

Figure 4. The dietary share of basic food groups (% in calorie equivalent) consumed by the population in the regions of Latvia, 2005

The observed differences in food dietary can be explained by the fact that the development of Latvian regions occurs very unequally. Leading Latvian researchers in their studies have proved that Latvian regions differ between each other considerably (Arhipova et.al., 2005), and can be divided into four groups:



- high development region – Riga, Pierīga;
- medium development region – Kurzeme;
- medium-low development region – Vidzeme, Zemgale;
- low development region – Latgale.

Table 2

**Disposable income by the regions of Latvia between 2003 and 2005,  
LVL per household member per month,**

Year	Regions						Riga/Latgale, %
	Riga	Pierīga	Vidzeme	Kurzeme	Zemgale	Latgale	
2003	125.23	84.48	67.97	68.10	73.69	56.83	220%
2004	135.24	102.77	83.34	89.88	89.66	67.20	201%
2005	146.12	108.87	88.38	92.56	100.14	79.58	184%

*Source: author's calculations based on the data of the Central Statistical Bureau*

Overall we concluded that the percentages of cereal and meat products nutritional value balance depended on the total regional development, indirectly characterized by the income per capita. The more developed region and the higher inhabitant's income, the higher nutritive value of qualitative meat and meat products and lower bread and cereal products percentage in nutritional value balance.

The influence of different factors on food consumption varies and depends on economic development and social conditions in the region. When analysing the dynamics of food consumption in the regions of Latvia, the physiological and psychological factor groups theoretically can be considered to be constant, as the change period is very long. The economic factors - income level and prices - change much faster.

### **Conclusions and proposals**

The study results show that the consumption of basic food groups – bread and cereal products, meat and meat products, milk and milk products – and fats over the last 15 years has changed, and constantly the consumption of meat and milk products increases, where the role of this product group in urban residents' diet is larger than for rural residents' diet.

Bread and cereal products, and fats still play quite an important role in energy balance for the lowest income group of inhabitants, including rural ones.

Assessing the consumption of different food groups among rural and urban residents, as well as residents of different regions of Latvia we concluded that there were differences in food dietary patterns. At the present stage of state development income and region development are the factors leading to the diversity in diets.

Compared with the less diversified dietary of the rural inhabitants, city dwellers have a varied diet rich in animal proteins and plant origin fats, characterised by higher consumption of meat, poultry, yogurt and other dairy products, while rural residents consume more whole milk and animal fat.

In regions with low income per capita (Latgale, Vidzeme, Kurzeme) the consumption of bread and cereal products is bigger than in the regions with higher income (Riga, Pierīga, Zemgale), therefore it could be affirmed that the consumption of bread and cereal products is conversely to the income of population.

Summarising the information and data about the factors influencing food consumption we came to the conclusion that in the earlier period of development of the state in transition like Latvia at present, it was indicated that per capita income level is the most important factor affecting food consumption patterns, but with the growth of income level and further state development it has been proved that other factors would be important for affecting food consumption patterns.

Therefore, future research challenges will be to examine other factors besides the level of income, urbanisation and regional differences such as socio-economic groups, age, education level and demographic of householder; as well as the changes in lifestyle, health and environmental concerns etc.

### **References**

1. Akbay C., Boz I., Chern W.S. (2007) Household food consumption in Turkey. *European Review of Agricultural Economics* Vol. 34 (2): pp. 209-231
2. Aragrande M. et al. (2005). Quick scan of the food supply chain dynamics, labelling and certification schemes and policies, rules and regulations in the selected EU country. Food supply chains dynamics and quality certification. 66 p. [http://foodqualityschemes.jrc.es/en/documents/NationalreportFI\\_000.pdf](http://foodqualityschemes.jrc.es/en/documents/NationalreportFI_000.pdf)
3. Arhipova I., Bāliņa S., Rudusa I. (2005) Latvijas reģionu attīstības rādītāju kvantitatīvā analīze. *LU Raksti*, 690 sēj.: 151-159.lpp.
4. Cohen B. (2006) Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in Society* 28: pp. 63-80
5. Dobel S. Palludan E., Jensen F. (2004). Consumption and the Environment in Europe Trends and Futures. Environmental Project no. 904, 2. [http://www2.mst.dk/common/Udgivramme/Frame.asp?pg=http://www2.mst.dk/Udgiv/publications/2004/87-7614-193-4/html/kap04\\_eng.htm](http://www2.mst.dk/common/Udgivramme/Frame.asp?pg=http://www2.mst.dk/Udgiv/publications/2004/87-7614-193-4/html/kap04_eng.htm)
6. Gehlhar M., Coyle W. (2001). Global Food Consumption and Impacts on Trade Patterns. <http://www.ers.usda.gov/publications/wrs011/wrs011c.pdf>
7. Michaelis L., Lorek S. (2004) Consumption and the Environment in Europe: Trends and Future. Danish Environmental Protection Agency, Environment Project No. 904: 130 p.
8. Nord M., Andrews M., Carlson S. (2007). Measuring Food Security in the United States. United States Department of Agriculture Economic Research Service//Economic Research Report Number 49. <http://www.ers.usda.gov/Publications/ERR49/ERR49.pdf>
9. Pack A., Friedl B., Giljum S., Jäger J., Omann I. (2006) Sustainable Food Consumption: Tends and Opportunities. Sustainable Europe Research Institute. Final Report: 53 p.
10. Pack A., Friedl B., Lorek S., Jäger J., Omann I., Stocker A. (2005) Sustainable Food Consumption: Tends and Opportunities. Sustainable Europe Research Institute. Interim Report: 29 p.
11. Putnam J.J. and Allshouse J.E. (1999). Food Consumption, Prices, and Expenditures, 1970-97. *Statistical Bulletin* No. 965: 196 p.
12. Schmidhuber J. (2003) The outlook for long-term changes in food consumption patterns: Concerns and policy options. *FAO Scientific Workshop on Globalization of the Food System: Impacts on Food Security and Nutrition*, FAO, Rome.
13. Souci, S.W., Fachmann W., Kraut H., 1994. Food Composition and Nutrition Tables. Scientific Publishers. Stuttgart. 608 p.

## **Methods of Professional Activation for the Unemployed in Agricultural Areas within the Project of the Community Initiative EQUAL (Part 2)**

Dr.eng. **Malgorzata Michalcewicz**  
Department of Management  
Management Information System Department  
University of Technology and Life Sciences in Bydgoszcz

### **Abstract**

The article provides the experience concerning the classes connected with the Internet conducted as part of the PIW EQUAL – “Get up, Raise Your Head” – Action 2 and Prolonged Action 2. Several guidelines have been proposed, which may be taken into account during the implementation of similar projects. The participants of the training overcame their internal intimidation against using the Internet, the participants displayed considerable interest in electronic mail and the Gadu-Gadu communicator. The means that their use most often includes: electronic mail, the communicator; besides they look for information related to their work. Despite a lack of preparation and limited access to the modern means of collecting information and communicating, the training participants displayed interest in the Internet.

Implementing similar projects in an environment endangered with marginalisation gives bigger possibilities of spreading new information technologies, which are used by the information society. The conducted cycle of trainings on the topic of the Internet indicates an increase in the number of hours. When preparing the training materials for the needs of other projects, the level and stage of advancement of the participants in the area of using the computer and the Internet should be acknowledged. The trainings concerning the Internet should be rather conducted by the same trainers, for the purpose of a better contact with the training participants and an equal performance of the material.

**Key words:** unemployed, information technology, the Internet, raising qualifications

### **Introduction**

The Internet is a computer network of a worldwide range, which connects thousands of small and big local networks and single computers.

The beginning of the Internet is dated back to the 1960s of the 20<sup>th</sup> century, and this is one of the major events of the century. The symbolic date of the beginning of the Polish Internet is considered to be the day 17 August 1991, when the first Internet connection was commenced between the Department of Physics of Warsaw University and the Computer Centre of Copenhagen University. The Internet enables a fast and easy access to the scope of knowledge from nearly any area of life; it combines the features of the press, the radio, and television.

The information revolution and the newborn information society have become a global phenomenon, which has had considerable impact on the development and shaping of the society.<sup>28</sup> These are the factors which stimulate the scale and the quality of the particular social and economic transformations, becoming the source of many new problems, which do not only create new possibilities, but also new threats.<sup>29</sup>

### **Aim, method and organisation of the research**

The aim of the article is to describe already possessed skills and newly-gained qualifications in information technology of the project participants applying the case-study method.

This part of the article is focused on the task implemented by the University.

---

<sup>28</sup> Bednarek J., *Media w nauczaniu*. Publ. Mikom, Warszawa 2002, p. 240

<sup>29</sup> Zajdel M., Tomczak E., „Technologia informacyjna w edukacji” conference materials, Publications Department ATR, 2003 p. 87 – 96.

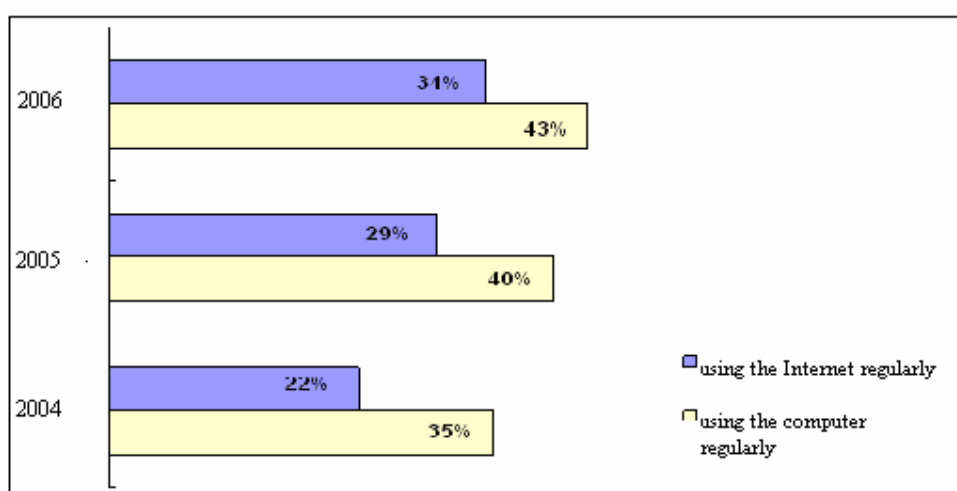
### Research methods

The article presents the progress in computer skills achieved by the project participants thanks to applying appropriately prepared tests and Electronic Base of Knowledge in accordance with the project methodology presented in the first part of the article.

One of the aims of the performed PIW EQUAL project: “Get up, raise your head” was to indicate some possibilities of using new information technologies by people endangered with social exclusion.

The research conducted by the Central Statistical Office on the topic: “The uses of information and communication technologies in 2006” point, that: “...The most common reason for using the Internet (not connected with professional activity) was communicating via the e-mail, Internet communicators, telephone conversations through the Internet, participating in chatrooms and discussion forums. 34% of people in the age from 16 to 74 used this kind of exchange of information. Every fourth person searched the Internet for information about goods or services, and every sixth person – downloaded games, films, music, or participated in Internet games, read or downloaded magazines available on-line.”<sup>30</sup>

The following diagram indicates that the number of people using the Internet has regularly grown by 1% in the years 2004 – 2006.



Source: Central Statistical Office <http://www.stat.gov.pl>

Figure 1. **The percentage of people using the computer and the Internet regularly (at least once a week) in the years 2004-2006**

### The performance of tasks within the module “Friendly Internet” Action 2

The planned trainings have been divided into eight thematic groups, where each unit covered a separate issue performed during five-hour training. The participants have been introduced in the features of the Internet, getting to know, in short, its history, and the chosen internet services: electronic mail, the Gadu-Gadu communicator, and the WWW service.

The thematic groups are presented below:

- the basics of electronic mail and Internet communicators (introduction to the Internet, basic functions of the Internet browser, address field, toolbar, setting the home site);
- the basics of electronic mail (basic notions and principles of use, the structure of a mail address, creating an individual mail account, e-mail box, editing and sending a letter);

---

<sup>30</sup> The use of information and telecommunication technologies in 2006 (information note) Central Statistical Office [on-line access], [access 22.01.2007], Available on the Internet  
<[http://www.stat.gov.pl/dane\\_spol-gosp/spoleczenstwo\\_informacyjne/2006/index.htm](http://www.stat.gov.pl/dane_spol-gosp/spoleczenstwo_informacyjne/2006/index.htm)>

- user uses of electronic mail (address book, attachments, replying to an e-mail, spam and virus threats, etiquette);
- Internet communicators (introduction to using the service of direct communication, the installation of the Gadu-Gadu, first star and user registration, configuration of settings of the users, exchange of information within a group of users);
- tools for searching for information on the Internet (browsers, Internet catalogues, multi-browsers);
- the strategy of searching for information on the Internet (methods and techniques of browsing, searching for phrases, logical operators, the use of “+” and “-” symbols, the principles of using the “Google” browser, the principles of using the “Szukacz” Internet browser);
- browsing through Internet bulletins for the needs of the beneficiaries part (browsing through the servers of the Employment Offices – regional and voivodeship, becoming acquainted with the content of the sites on the browsed servers – searching for contacts, current information, getting acquainted with the “ABC of a job-seeker”);
- browsing through the information bulletins for the needs of the beneficiaries part II (browsing through work offers, CV and motivation letter templates – examples and performance of individual needs of the beneficiaries connected with searching for information.<sup>31</sup>).

The training related to the issues connected with the Internet has been implemented during 40 hours. The implementation of the problems associated with the Internet has been planned from 17 to 22 trainings, and on the 33<sup>rd</sup> and 44<sup>th</sup> training. The classes have been divided into two stages. In the first stage, six issues have been covered, and in the second stage – two issues. The first part of the issues concerned the use of the basic Internet functions. The second part was commenced after a ten-class break and was devoted to more advanced issues related to browsing information services.

The participants, by using the training materials and the guidelines provided by the tutors, have learnt the principles of using the Internet and moving around its resources. Due to a rather meagre initial interest in this issue from the participants, several modifications have been introduced to the implemented classes and training materials. The adjustments were connected with the content of the browsed issues. Moreover, it has been agreed, that after the first sequence of classes, the trainings concerning the Internet would appear for each training in order to preserve the acquired knowledge. The participants have been provided with several tasks they had to perform on each class. During every class, the participants checked their mail accounts, sent some letters and searched for information according to the given browse terms. The participants were asked to send the performed activities on the e-mail addresses of tutors conducting the classes.

During the classes, the tutors received, in total, 325 electronic letters.

During the computer training, 2 tests have been conducted which verified the abilities of the participants in the range of using electronic mail and searching for basic information. The test has been conducted in all groups, in total, 35 training participants have taken part.

In the matter of using electronic mail, the participants were to: send a few letters on the given addresses, send a letter with an attachment, which has been earlier saved in an appropriate place on the disc, and to send a letter with a copy to another addressee.

After summing up the results, the use of electronic mail has been passed by 97% of the participants, including 95% of women and 100% of men.

In order to evaluate the abilities in the range of searching for information on the Internet, the participants were to find appropriate websites, and to enter the specific information provided in the task in the Internet site browsers.

- train schedule at the PKP;
- on the topic of the match: Ghana – Italy;
- Regional Employment Office in Żnin;
- weather forecast for the Kuyavia and Pomerania voivodeship;
- multikino.

As a final result, this task has been accomplished by 96% of the participants, including 100% of women and 91% of men.

---

<sup>31</sup> Friendly computer, Friendly Internet. Training materials EQUAL, ATR 2005

During the implementation of individual needs connected with finding information on the Internet, it has been observed, that most often the information concerned personal interests or the sought profession, which was often connected with professional advancement, which was initiated for the participants during the project.

During the observation of the participants while performing the tasks, several problems have been noticed, primarily concerned with:

- remembering the address of the portal, on which the e-mail account has been created, and the following logging in to the e-mail account;
- entering the given address of the Internet site, the participants did not discern between the browser field and the "address" field in the browser;
- searching for a file on the disc according to a given access address, in order to send a letter with an attachment.

### **The implementation of tasks within the module "Friendly Internet" Prolonged Action 2**

The analysis of the course of the training with the use of software without the class programmes and collections of tests conducted after the end of the thematic training justified the initiation of works on the modification of this element of the programme of information education implemented within the EQUAL trainings. The solutions used in the first edition of the training were based on specifically designed class programmes with variants of tests drawn for each of the group, which would evaluate the level of advancement of the abilities of achieving the aims of the training. The classes conducted with the groups and the evaluations of the used tests indicated the necessity to strengthen the effects of feedbacks occurring between the class programmes and the effects of the performance of these programmes in a didactic process. A low level of advancement in the abilities related to the use of the computer also in the current group of beneficiaries caused, that the rank of the tests and the frequency of their designation is to become a natural feedback for the people conducting the classes. Such an aim caused, that the starting point for the enhancement of the didactic process is the designation of a new formula of creating the following ability tests, which may evaluate the scale of the required modifications.

Several design changes have been performed, which incorporated the reservoirs of knowledge and the previously designed test methods evaluating the mastering of abilities, which may be used in the new version of the software, which adapt easily to the real needs of the user. A feedback is created then, which concentrates the didactic process on the given areas of knowledge. This interesting and justified with didactic effects approach allowing for performing easy changes with the acknowledgement of the real level of the acquired abilities in relation to the process planned earlier. This meant the necessity to perform changes in the functionality of the designed system, which has been reconstructed as a solution of the toolbar software, for which in each phase of the tests, any changes may be performed in the training materials and, appropriately for the level of advancement of the hearer of the test variant for many receivers. This concept points also to the possibility of the rise of threats stemming from a severe restrictions in the development of abilities, in order to restrict excessive, in the opinion of the hearers, pace which forces them to overcome numerous barriers occurring in the educational process.

A vital element of the performed modernization in the computer software of supporting the class records and testing the opinion of the hearers, and evaluating their abilities, is creating a reservoir of knowledge concerning anonymous test results.

The analysis of the test results by people conducting the classes was an element of the feedbacks leading to the acknowledgment of the adjustments in the class programmes. In September, 16 classes were conducted according to the frame design, after introducing the bases of using the computer and the principles of use of the Internet. The results of the analysed tests indicate that the key to overcoming the perception barriers of the hearers lays in sequential repeating of the fragments of the introduced abilities through their repeating and preserving during the following classes.

The above mentioned initial analysis of the class record as part of the project points to a superior role of feedbacks in the currently implemented programmes stemming from systematically performed tests according to the modified formula.

In December, several tests have been conducted with the aim of checking the abilities of the course participants to use the computer. The training participants displayed a very good ability to use the Internet,

all of them achieved a 100% in searching for information, and as far as electronic mail is concerned, only two participants achieved a 0.5 point less than the maximum note.

Table 1 sets the indices of ability of people taking part in the training. According to the designed methodology, in order to pass, the participant needs to gather 50% of the points from particular partial tests.

Table 1

### Indices

Test	Date of pass	Number of people, who passed the test	In total, passed 100% = 12	Women 100%=10		Men 100%=2	
				number	[%]	number	[%]
Electronic mail	9.12.2007	9	75	9	90		
Electronic mail	10.12.2007	2	17			2	100
Electronic mail	<b>10.12.2007</b>	<b>11</b>	<b>92</b>	<b>9</b>	<b>90</b>	<b>2</b>	<b>100</b>
Browsing information	10.12.2007	11	92	9	90	2	100
Using the Internet alone	10.12.2007	11	92	9	90	2	100
Using the computer alone	10.12.2007	11	92	9	90	2	100

Source: Own research

### Conclusions

Monitoring computer and the Internet skills supported by tests reveals that supposed aims of the projects were achieved. 80% of participants raised their qualifications and acquired new skills in information technology.

Hints and observation results gained through implementing the Module called Friendly Computer – Friendly Internet are presented below.

The training participants overcame the internal inhibition against using the Internet. The participants displayed high interest in electronic mail and the Gadu-Gadu communicator. Until the present day, a part of the course participants uses the Internet regularly at home or at an Internet café. Most often they use electronic mail, the communicator, and they search for information about work. Despite a lack of preparation and limited access to the modern methods of collecting information and communicating, the training participants displayed an interest in the Internet. Implementing similar projects in an environment endangered with marginalisation gives broader possibilities of spreading new information technologies, which are used by the information society. The conducted cycle of trainings on the topic of the Internet points leads to the increase in the number of hours. When preparing training materials for the needs of other projects, the level and stage of advancement of the participants in the matters of using the computer and the Internet should be taken into account. The trainings in the matter of the Internet should rather be conducted by the same tutors, in order to achieve a better contact with the training participants and an equal performance of the material. It is proposed to increase the number of classes for self-performance.

## References

1. Bednarek J., *Media w nauczaniu*. Publ. Mikom, Warszawa 2002, P. 240,
2. Friendly computer, Friendly Internet. Training materials EQUAL, ATR 2005
3. The Use of Information and Telecommunication Technologies in 2006 (Information note) General Statistical Office [access on-line], [Access 22.01.2007], Available on the Internet <[http://www.stat.gov.pl/dane\\_spol-gosp/spoleczenstwo\\_informacyjne/2006/index.htm](http://www.stat.gov.pl/dane_spol-gosp/spoleczenstwo_informacyjne/2006/index.htm)>.
4. Zajdel M., Tomczak E., „Technologia informacyjna w edukacji” conference materials, Publishing Department ATR, 2003 p. 87 – 96.
5. <http://www.equal.gov.pl/>
6. <http://www.equal.org.pl/>
7. [http://ec.europa.eu/employment\\_social/equal/index\\_en.cfm](http://ec.europa.eu/employment_social/equal/index_en.cfm)
8. <http://www.projekt-sampo.com.pl>



## **Meaning of Transborder Cooperation in the Development of Western Borderland in Poland**

Prof. Antoni Mickiewicz Ph D  
Bartosz Mickiewicz Ph D,  
Agricultural University in Szczecin, Poland

### **Abstract**

The border location became one of the most essential factors stimulating the local development. Regional and local initiatives aiming at the search of plans for the neighbourhood cooperation of border regions have sprung up in the after-effect.

The paper presents the role, effects and influence of euro regional cooperation and transborder agreements of three euro regions on socio-economic activation of rural areas and small towns. The study also presents the special role of parishes' development, main problems of border areas, the use of local human and economic resources on Polish western borderland.

**Key words:** Crossborder cooperation, European integration, euro regions, Poland, Germany

### **Introduction**

Globalisation and regionalisation are characteristic socio-economic phenomena setting in the world. The growth of regional endeavours is the next essential trend observed in international relations.

The region becomes important public good, from the point of view of local and regional communities. In dependence from its attractiveness of economic, social and natural environment spaces, it can attract or discourage investors. Local subjects aim at the acknowledgement of their autonomy, regional specific, cultural distinction and the right to independent undertaking of decisions and bearing responsibility for the region.

The border location has become one of the most essential factors stimulating the local development. Regional and local initiatives aiming at the search of plans for the neighbourhood cooperation of border regions have sprung up in the after-effect.

The aim of the study was the performance of achievements of transborder Polish-German cooperation in the socio-economic activation of border areas.

The essential premise of undertaking of this subject results from the membership of our country in the structures of the European Union (EU) and the opening of Polish economy to the world markets. The economy of euro regions fulfils in these cases the momentous part, and reflects the whole economy of the country. The target models answering the challenges of the EU standards and businesses of population living there should be considered in the process of restructuring and modernization of borderland. Polish border regions cooperate with high developed border areas of Germany, and they can serve as an example of socio-economic solutions for Polish entrepreneurs and businessmen. The case of adjusting Polish border areas to the standards of the EU will be long, and it had not ended with Poland's accession to the EU. However border barriers (from 2008 – Schengen sphere) will be minimized, thus having a positive influence on the possibilities for development.

### **Materials and research methods**

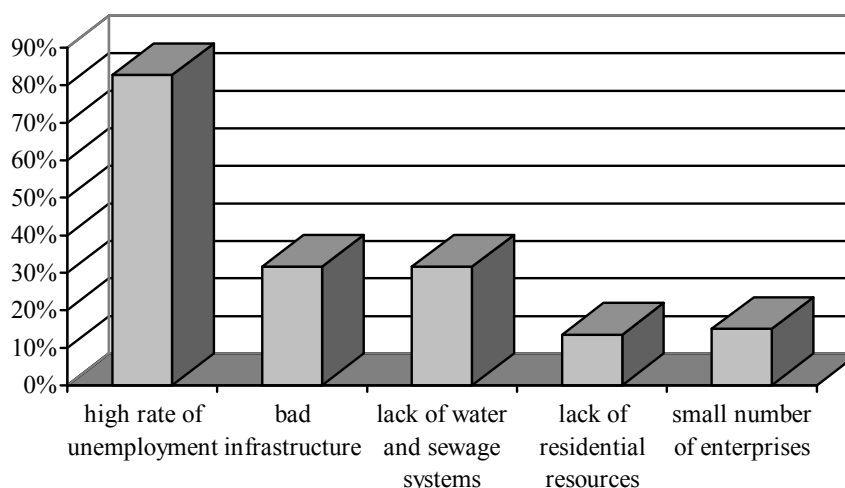
The research was carried out during 2005-2007 with the use of especially prepared questionnaires in all parishes belonging to the euro regions mentioned below. The experts from the Extension Services in the analysed euro regions: Pomerania, Viadrina, and Sprewa-Nysa-Bóbr were engaged in the research. The questions concerned the following aspects: general data on the population, state and the possibility for the development of agriculture, problems of the development of entrepreneurship, the development strategy of the commune, regional cooperation and the protection of the natural environment.

The mentioned method was applied to examine the condition of knowledge and approach to the matter of the achievement of Polish-German transborder cooperation in the social activation of border areas among village mayors. The research was conducted in 140 populated areas, applying the purposeful choice.

The gathered information was processed using the methods of quantitative and qualitative analyses, and summarising it in descriptive and tabular forms.

### General characteristics and main problems of transborder cooperation in communes

The main economic and social problems in parishes limiting the economic development of the region shown in Figure 1 are as follows: high rate of unemployment (82.7% answers), bad infrastructure (31.6%), lack of water and sewage systems (31.6%), lack of residential resources (13.5%), and small number of enterprises in the parish's area (15.0%).



Source: Own studies

**Figure 1. The main social and economic problems in border communes**

The average rate of unemployment among the rural population in the researched areas is 21.2%. Female unemployment forms the majority. However the average structure of the employment in the budget sphere is 19.3%, in agriculture 33.3%, in private enterprises 31.3% and in different economic subjects, e.g., state enterprises – 16.1%.

The opinion of technical and social infrastructure on the area of the commune was passed in the comparison to the neighbouring communes and provinces. Four levels of estimation were viewed: low, average, high and no data. The detailed data about technical infrastructure is summarised in Table 1.

Table 1

### Opinions about the state of social and technical infrastructure in communes

Specification	No differences in comparison to neighbouring:	
	commune (%)	province (%)
roads	76.4	67.1
sewage system	47.9	47.2
gas net	30.0	37.0
water pipes	45.7	47.1
phone system	62.2	45.0

Source: own studies

The condition of roads in the technical infrastructure was estimated as average 76.4% in comparison with the neighbouring communes and 67.1% in the comparison with the province; the condition of sewage system was estimated at the average level 47.9% and suitably 47.2%; gas net 30.0% showing low level in comparison with the neighbouring communes and 37% - the average level in the comparison with the

province; the condition of water-pipes was estimated on the average level in 45.7% of cases and suitable – 47.1%; phone system 62.2%, suitable 45.0% in the comparison with the province.

Social infrastructure was estimated also on average level. Respondents ranked to that group libraries, pharmacies, kinder gardens and cinemas.

The specific of the commune that may attract investors from Poland and abroad depends on architectural and landscape scenes, it was the opinion of 41.8% respondents. The location of commune and its approximation to the border (38.5% answers) is also the attractiveness for investors. Concerning the conditions of entrepreneurship development in the researched communes the respondents answered that they were rather conducive in 62.6% cases and not conducive in 37.4%.

Partnership relations were characteristic to 111 communes. 29 communes from both sides of the border did not have any partnership cooperation. The most partnership cooperation concerned the sphere of culture (74.6% answers), economic contacts (55.2%), youth exchange (23.9%), and common promotion of region (16.1%), sport (12.6%), and natural environmental protection (9.2%). The mayors in all the researched communes were actors for further deeper cooperation of local governments. They answered that such cooperation should remarkably strengthen the economic and social potential of the region. The local governments also support the existing economic subjects functioning in the region. Economic forums for initiatives (55.1% answers), organizations for business support (32.8%) and communes' entrepreneurship incubators (31.2%) have been created there. The forms of cooperation between the business sphere and commune concerned: subsidies for enterprise creations (31.8% communes), financing of order programmes (23.6%) and cooperation during the creation of communal development plans (19.8%).

All mayors declared (100%) they support the development of entrepreneurship by organising professional trainings for small and medium size enterprises sector (SME) and appointments with enterprisers from other side of the border.

### **Challenges of transborder development in communes**

The aim of cooperation is undertaking of common workings for sustainable and equable development of the region and rapprochement of inhabitants and institutions on both sides of Polish-German border. The cooperation of regions should soften the negative results of the existence of the border being one of the preferences of the European Council and one of the European Union initiatives. We have to deal with an enthusiastic development of this cooperation in Poland. International situation, the existence of the various kinds of arrangements, geographical position and the condition of mutual relations between partners may be included as the most important factors that contribute to the cooperation within the euro regions. Cooperation should lead to the conversion of experiences for the mediation of knowledge transfer or by working out common projects along both sides of Polish-German border. The aim of that cooperation is also the offer of larger possibilities of activity - the desirable result. The cooperation is also considered as an efficient tool for strengthening regional development.

The chances for dynamic Polish-German transborder cooperation and socio-economic activation of border areas result from the opening of Polish economy to the world markets and the membership of our country in the structure of the European Union.

The institutions of the business surroundings can play a large role in the development of the entrepreneurship in the state. The economic and trade organizations are the most popular institutions of the business surroundings in 29.6% of the researched communes. Independent position in matters of promotion and the development of the entrepreneurship exists in 39.1% of communes.

Many problems which solution requires studies and introduction of local development strategy of communes exist on the border areas of euro regions. The researches showed that 61.9% of populated areas possess such a strategy; however 38.1% do not. The biggest problem is the lack of financial means (92.5% communes), the lack of interest from the local council and community, and the lack of qualified personnel.

The populated areas instituting the strategy confirmed the positive effects of implemented aims included into the strategy. The majority (74.4%) related to the protection of the environment. The building of sewage and water-pipes system, building of the sewage treatment plant, the repair of roads, social and education development, and promotion and development of the tourist base came as next.

For presentation of the possibilities of euro regions communes' development, SWOT analysis with the underlined strong and weak points and chances with threats was applied (Table 2).

Table 2

**SWOT analysis of the researched communes in euro regions**

<b>Strong points</b>	<b>Weak points</b>
<ul style="list-style-type: none"><li>- environmental conditions</li><li>- attractiveness of location</li><li>- many areas for economic activity</li><li>- building investments</li><li>- border neighbourhood</li><li>- human resources</li></ul>	<ul style="list-style-type: none"><li>- bad infrastructure</li><li>- high rate of unemployment</li><li>- economic stagnation</li><li>- lack of financial funds</li><li>- weak quality of service (thus discouraging potential clients)</li></ul>
<b>Chances</b>	<b>Threats</b>
<ul style="list-style-type: none"><li>- transborder and regional cooperation</li><li>- EU integration</li><li>- good location in comparison to big cities</li><li>- agrotourism development</li><li>- new investors</li><li>- better natural environment protection</li></ul>	<ul style="list-style-type: none"><li>- possibilities of unemployment increase</li><li>- difficulties in financial funds absorption</li><li>- weak economic activity of enterprises</li><li>- unstable and changing legislation</li><li>- lack of legal regulations</li></ul>

Source: own studies

The financial support has a positive influence on the implementation of small entrepreneurship projects, own promotion, tourism development and foreign contacts in 80.5% of communes. The research was also important from the point of closeness of Polish – German border influence on the functioning of Polish communes. The results show that 57.3% of communes had profits of such location. Answering to the question on what spheres are the most important in such contacts the respondents paid attention to cultural meetings – 82.1% answers, exchange of information and common visits – 81.9%, and school and sport events – 77.1%. The negative factors exist between border areas, they are as follows: the disparity of economic development and salaries, big traffic of cars, and insufficient quantity of border crossings.

Organizational barriers also result from administrative-legal differences in Poland and Germany. This results in the lack of knowledge of German partners on the division of competences among Province Councils and Marshal Offices. There is no knowledge on unambiguous qualification of the competence of local governments in transborder cooperation. The next important area of interest is the problem connected with the location of objects hostile to surrounding like: garbage landfills, sewage treatment plants in Polish side of euro regions and “ecologically clean technologies” in Germany. The problem concerns the bringing of the environment in the region to the norms of the European Union. Foreign investors return to this fact particularly. Therefore the enlargement of the financial means to solve all problems of the environment becomes necessary. There are many other different barriers in individual regions. Despite these Polish-German cooperation is still developing and is, on one hand, a great chance, on the other hand, a big challenge for socio-economic change of the region.

## Conclusions

Summing up it should be noticed that the basic area of the regional cooperation of border lands in Poland and Germany results from the existing barriers. The main areas of interest of the two nations are: investments, modernisation of infrastructure, improvement of natural environment, and all forms activity directed towards the elimination of unemployment liquidation.

The research showed that there were comparatively little creative workings in border regions, initiated by agricultural manufacturers, businessmen or the decision-makers in communes and small cities. They do not feel creative individuals. Communes often see neither the need nor the sense of the initiating of new workings which, in the future could be the innovations of new products or services. The perspectives of the transborder cooperation in future will to a great extent depend on legal, financial, informative, political and infrastructural solutions. Therefore further development of the border areas in Poland and Germany will possibly overcome all the existing barriers.

Unfortunately nowadays in Poland there is observed comparatively low influence of the financial means on the activation of the border areas. Especially the pressure must be put for the development of technical infrastructure, education, business development and innovations. New, necessary financial funds would let to minimise the existing barriers and be a chance for a modern and sustainable development.

During the studies it was observed that two major areas which need maximum coordination of activities and big expenditure of investment means are in opinions of the respondents. They are natural environment protection and transport infrastructure improvement.

Also the lack of system approach to information and management of knowledge in borderland that negatively reflects in social and economic activities of Polish and German communes is underlined. Especially it concerns natural environment protection. Better cooperation in the researched regions would let for minimisation of economic disproportions and increase of the inhabitants' living standard. Therefore the authors must put the thesis that further achievements of transborder Polish – German cooperation in borderland activation are especially important for the strengthening of the region and dynamics of the European integration processes.

### **References**

1. Godlewski J., Elementy współpracy regionalnej województwa szczecińskiego. Współpraca transgraniczna jako szansa dla rozwoju obszarów wiejskich w aspekcie wejścia Polski do Unii Europejskiej. AR, Szczecin 1999, s. 23-28
2. Konieczny S., Wykorzystanie środków pomocowych Unii Europejskiej Funduszu Małych Projektów zarządzanego przez Stowarzyszenie Gmin Polskich Euroregionu Pomerania. Osiągnięcia transgranicznej współpracy polsko-niemieckiej w społeczno-gospodarczej aktywizacji obszarów przygranicznych. AR, Szczecin 2006, s. 168-177
3. Kiernożycka-Sobejko A., Polsko-niemiecka współpraca przygraniczna w świetle teorii korzyści komparatywnych. Region 2003, US, MBA Szczecin 2003,, s. 49-57
4. Mickiewicz A., Mickiewicz B., Znaczenie współpracy transgranicznej w rozwoju gospodarczym regionów przygranicznych. Osiągnięcia transgranicznej współpracy polsko-niemieckiej w społeczno-gospodarczej aktywizacji obszarów przygranicznych, AR, Szczecin 2003, s. 126-142
5. Orylska J. (red), Współpraca transgraniczna jako szansa dla rozwoju obszarów wiejskich w aspekcie wejścia Polski do Unii Europejskiej. AR, Szczecin 1999, s. 258-269
6. Sekuterska G., Worobjow L., Bariery i ograniczenia polsko-niemieckiej współpracy w zakresie rozwoju obszarów przygranicznych. Osiągnięcia transgranicznej współpracy polsko-niemieckiej w społeczno-gospodarczej aktywizacji obszarów przygranicznych. AR, Szczecin 2003, s. 112-118

### **Streszczenie**

Celem pracy jest próba przedstawienia osiągnięć transgranicznej współpracy polsko-niemieckiej w społeczno-gospodarczej aktywizacji obszarów przygranicznych. Podano możliwości rozwoju rolnictwa, przedsiębiorczości i obszarów wiejskich położonych w Euroregionie przedstawiając: ogólne dane o gminie, stan i możliwości rozwoju rolnictwa w gminie, problemy rozwoju przedsiębiorczości, strategię rozwoju gminy, współpracę euroregionalną gmin i ochronę środowiska naturalnego. Podano kryteria doboru obiektów do badań i informacje o respondencie. Zatem należy oczekiwać, że osiągnięcia transgranicznej współpracy polsko-niemieckiej w społeczno-gospodarczej aktywizacji obszarów przygranicznych wpłyną na opracowanie strategii tych obszarów i pozwolą na wzmocnienie procesu integracji europejskiej.

**Słowa kluczowe:** współpraca transgraniczna, integracja europejska, euroregiony, Polska-Niemcy.

## Awareness and Managing of Agricultural Cross-compliance Standards in Estonia

Maire Nurmet, PhD<sup>(1)</sup>, Anne Põder, BA<sup>(1)</sup> Jüri Lehtsaar, PhD<sup>(1)</sup>, Rando Värnik, PhD<sup>(1)</sup>, Enn Plaan, PhD<sup>(1)</sup>, Peedu Zeiger, PhD<sup>(1)</sup>, Ülar Loolaid, BSc<sup>(2)</sup>

<sup>(1)</sup> *Institute of Economics and Social Sciences of Estonian University of Life Sciences. Fr. R. Kreutzwaldi St. 1A, 51014 Tartu, Estonia*

<sup>(2)</sup> *Institute of Rural Development, Tuglase St. 13, 51014 Tartu, Estonia*

### Abstract

The paper is dealing with the topic of cross-compliance standards. Good agricultural and environmental condition is an obligatory minimum requirement for all farmers to attain. Cross-compliance is compulsory. All farmers receiving direct support will be subject to cross-compliance. We investigate how aware are Estonian farmers of cross-compliance standards, and how they estimate to manage with the standards in future. We examine the extent of problems connected with environmental rules, including new requirements regarding public, animal and plant health, animal welfare, and the maintenance of all agricultural land in good agricultural and environmental condition.

The study is based on the outcome of a questionnaire-based survey conducted in 2007. The sample of the respondents was based on the information of the Estonian agricultural registers and information board (arib), concerning the beneficiaries of single area payment, support to breeders of agricultural livestock and additional direct aid for the cultivation of agricultural crops in 2005.

The results show that cross-compliance standards are followed partially, and there are several problems to be solved in order to raise the awareness of cross-compliance rules of farm managers and workers.

**Key words:** cross-compliance, good agricultural and environmental condition, mandatory management requirements, type of enterprise, agricultural entrepreneurs

### Introduction

Various laws and regulations that establish general environmental requirements – mandatory management requirements for agricultural enterprises and good agricultural and environmental practice to be observed by agricultural enterprises – have been adopted in Estonia since 2004. Granting of direct aid to agricultural producers shall soon depend on the compliance of their production conditions with the requirements to be implemented over the near years. Producers are required to comply with the cross-compliance requirements to qualify for the direct aid scheme of the European Union. The respective definition has been laid down with the European Union regulation No. 1782/2003 and consists of two parts: 1) mandatory compliance with management requirements (requirements laid down with 18 EU legal acts); 2) compliance with good agricultural and environmental practice. Producers are required to comply with the cross-compliance provisions of the good agricultural and environmental practice to qualify under the single area payment scheme. The new version of the European Union regulation on rural life development has replaced general environmental requirements for cross-compliance provision to assure uniform understanding of the requirements. This means that in future (2007-2013) the applicants for environmental subsidies, aid to producers of less-favoured areas, Natura-areas, etc. are required to meet the cross-compliance provisions (Enlargement of the European Union and Agriculture: Risks and Opportunities. 2004).

Compulsory management requirements include provisions that regulate environment and nature protection (incl. the protection of ground water and bodies of water, environment, natural birds, flora and fauna, protection of natural habitats, etc.), public and animal health care (incl. the identification of animals, assurance of food safety, etc.), plant health, infectious animal disease (incl. the procedure for notification of diseases, etc.) and animal welfare (incl. the keeping of calves, swine, poultry, etc.). Good agricultural and

environmental practice (code) stipulates the minimum land tenure standards (incl. soil protection, minimum maintenance works, erosion, etc.) that are to be observed by agricultural producers.

For the establishment of a successful training, information and advisory system it is necessary to establish the specific problems of a producer. Above all, this depends on the producer him/herself and his/her general level of awareness. The purpose of this study is to establish the awareness of Estonian agricultural producers of awareness requirements and, according to the producers, the capability to comply with the requirements both today and in the future.

So far, in-depth investigation on the impact of cross-compliance requirements has not been conducted; the studies are still in process and the number of final reports is limited. The research by Silcock (2007) has put forward policy options for the future of cross-compliance, and summarised its environmental benefits and damages, and identified its added value alongside with other regimes and programmes. Cross-compliance will have a positive impact on specific environmental issues including water quality, soils, biodiversity, landscape and the historic environment. In addition, cross-compliance is likely to improve farmer awareness of environmental issues. Looking at the Swiss experience with cross-compliance since 1999, a paper, written by Mann (2005), shows different perspectives on the efficiency and fairness of cross-compliance. He concludes that transaction cost advantages justify cross-compliance only in few cases. Usually, it will be more efficient to decouple social and environmental policy.

In the discussion on future agriculture the question of nature and landscape quality plays an increasing role in relation to the disengagement of the agricultural subsidies and the demand for [cross compliance](#). The study by Højring, K.; Hansen, L., Noe, E. (2004) show a variation amongst the farmers in the priority they give to nature and landscape. On some farms it is considered an essential part of the management objective, whereas on others, it is an insignificant aspect of farm management drawing little or almost no interest and attention. The premise for communication and dialogue about nature quality is the development of a common language. The study shows that the farmers' perceptions of qualities in nature do not clearly correspond with the biologists' ideas of nature quality. The differences in perception hold both opportunities and conflicts.

This article studies the awareness of agricultural producers of cross-compliance requirements and their ability to bring their production into conformity with the requirements. To meet this objective, a questionnaire survey was conducted during Quarter 1 of 2007. The sample was made up on the basis of the list of agricultural producers, having received single area payment, agricultural livestock breeding aid and additional direct aid for growing of agricultural crops of the ARIB (Agricultural Registers' and Information Board) of 2005. Entities having received at least one more type of payment besides the single area payment were selected from the list of beneficiaries. The questionnaire was sent to 150 producers; 80% responded by e-mail and 20% by regular mail.

Two thirds of the respondents were males, mostly middle-aged or older, having either higher education or special vocational education. Half of the respondents had agricultural special education. In most cases the individuals completing the questionnaire were either the managers of the enterprise or farm owners. According to the level of education, the respondents had higher education in private limited companies where approximately one half of the entrepreneurs had higher education while the same ratio among sole proprietors amounted to one third.

The information analysed is mostly applicable to small-scale producers, largely sole proprietors. Approximately one fifth of the sample consisted of private limited companies. Other types of enterprise represented were households with the average size of 5.5 ha (the number of such enterprises among the respondents was less than 10%). More than half of the questioned enterprises had two employees, as maximum. Private limited companies were larger than the production units owned by sole proprietors, both by the area of land and number of employees. While approximately 70% of sole proprietors, participating in the survey, were in possession of tenured land with the area under 50 ha, then in case of more than one half of the private limited companies the area of tenured land was above 250 ha. The largest private limited

company had 70 employees, several thousand animals and almost 2,000 ha of arable land while approximately 50% of the private limited companies had 5 employees, as maximum and the area of arable land was under 100 ha for one fifth of private limited companies. All the households and one half of the sole proprietors, participating in the survey, had annual sales revenues under 113,000 kroons while the relative share of equivalent private limited companies was one fifth of the sample. Almost one half of the private limited companies had annual sales revenues exceeding several million kroons.

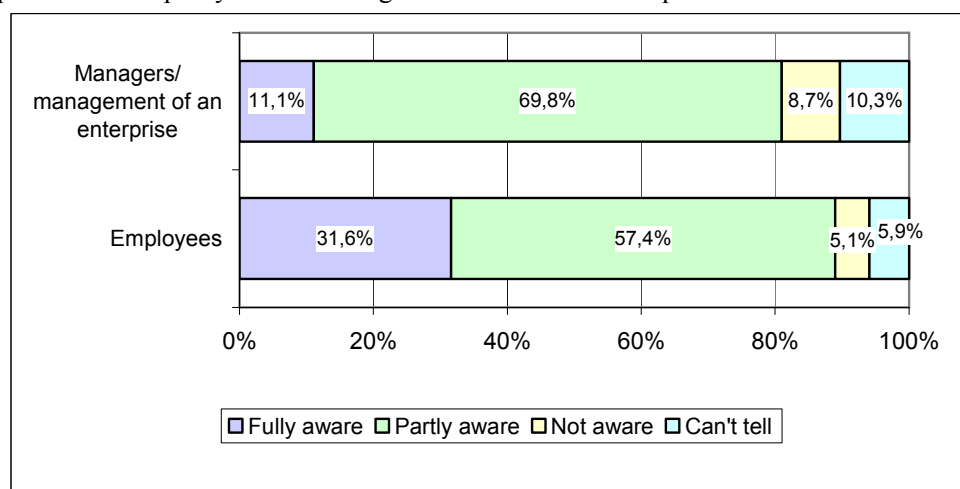
Majority of the enterprises were involved in several areas of business, mostly crop cultivation, animal husbandry and milk production. Smallest producers were also involved in horticulture and growing of permanent cultures, pig breeding and poultry. The largest enterprises participating in the survey – both regarding sales volumes, number of employees and area of arable land – were companies involved in milk production.

The opinions of the respondents, regarding the cross-compliance requirements, were divided into four categories: well available, available in part, not available, can't tell. Frequencies are used to demonstrate the outcomes.

## Results and discussion

The survey focused on assessing the awareness of the producers of the cross-compliance requirements and their ability to bring their production systems into conformity with the requirements.

The majority of respondents assessed the awareness of the managers and employees of their company of mandatory management requirements and good agricultural and environmental practice as highly relevant. Nevertheless, only 31.6% of the managers/management of agricultural enterprises was fully aware of such requirements while the same rate among the employees amounted to 11.1% (Figure 1). Therefore, majority respondents were partly aware of the general environmental requirements.



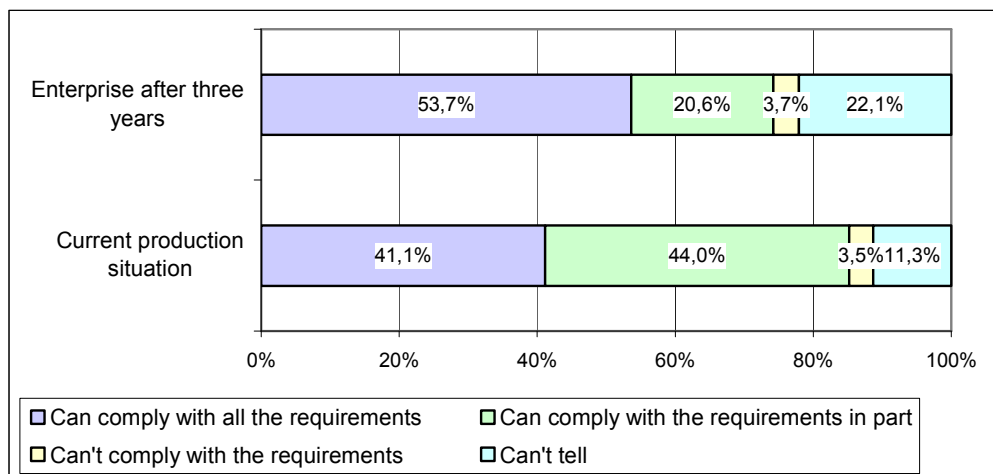
**Figure 1. Awareness of mandatory management requirements and good agricultural and environmental practice, applicable to agricultural enterprises**

The evaluation given does not differ considerably in section of type of enterprise but the relative share of respondents, responding as 'can't tell', was higher among sole proprietors. 37% of private limited companies and 30.9% of sole proprietors gave 'fully aware' assessment to their management. When comparing sole proprietors and private limited companies, the number of 'can't tell' or 'not aware' answers was higher by 10% among the sole proprietors. When assessing their employees, the ratio of 'partly aware' and 'fully aware' responses amounted to 83.3% and 4.2% respectively, among private limited companies while the same rate among sole proprietors was 64%



and 13.5% respectively. The representatives of other types of enterprise assessed their employees and management as 'partly aware'.

According to their own estimate, 41.4% and 44% respondents (Figure 2) were almost fully or partly able to comply with the cross-compliance requirements. In three years time, 53.7% and 20.6% of the respondents expect themselves to be capable of complying with environmental requirements, fully and in part respectively. 3.5% of the respondents assess themselves as unable to comply with the environmental requirements now and 3.7% in three years. While less than half of the respondents are currently able to comply with the environmental requirements, then the situation is expected to improve after three years. Nevertheless, one fifth of the sample cannot provide any estimates regarding the future. At the moment, 11.3% were unable to answer the question and this rate is almost equivalent to the entrepreneurs unable to estimate their awareness of general environmental requirements.

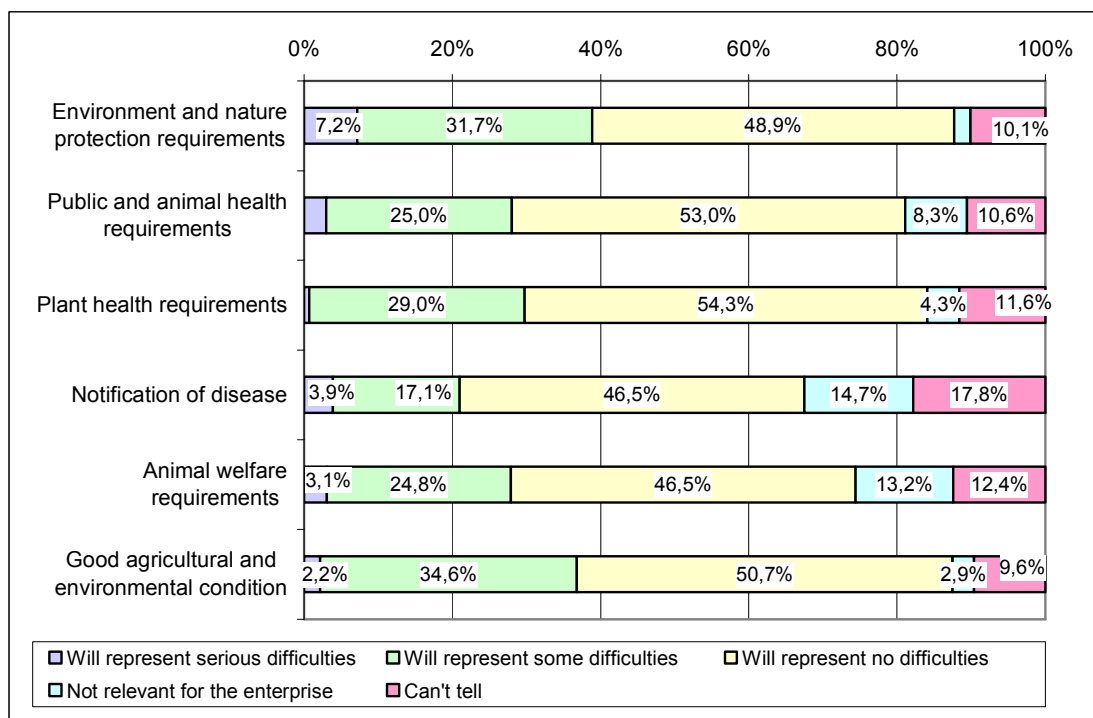


**Figure 2. Compliance with general environmental requirements now and in the future**

48.1% of private limited companies, 40.8% of sole proprietors and 60% of other types of enterprise were currently complying with the requirements in part. Private limited companies were more optimistic about the future as 63% expected to comply with the requirements in full and 22.2% in part. None of the private limited companies expected to be unable to comply with the requirements in the future. 54.3% and 19.1% of the sole proprietors can, respectively, comply with the requirements in full and in part in the future. One fourth of the respondents was unable to assess their capability to meet the requirements or expected them to be unable to meet the requirements in the future.

The situation is the following by types of activity: the capability to comply with the requirements is the best among crop cultivation enterprise (43% of the respondents), and the worst among pig breeding (14%), poultry (23%) and combined production (25%) enterprises. Approximately 33% of poultry enterprises expect themselves to be capable of meeting the requirements in three years. Therefore, the compliance with the requirements seems to be most difficult for the poultry enterprises – both now and in three years. The expectations of combined production enterprises to comply with all the requirements in three years were most optimistic (66%).

According to the respondents, the compliance with mandatory management requirements and good agricultural and environmental condition should not be very difficult. Environment and nature protection requirements are seen as the toughest as 7.2% of the respondents expect to face serious difficulties when complying with the requirements.



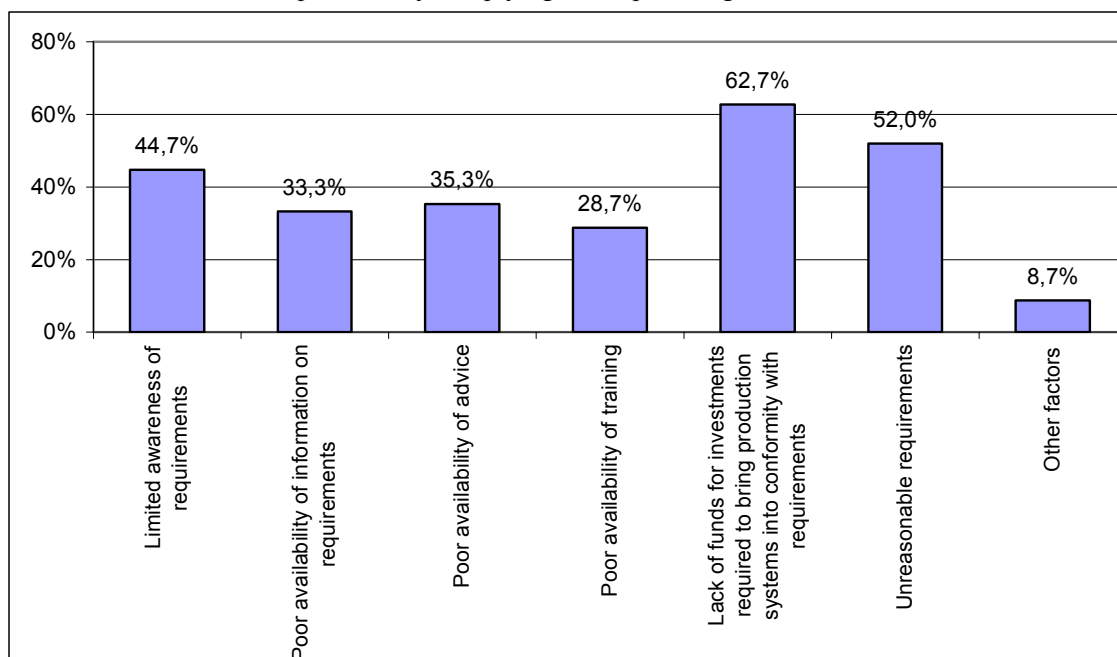
**Figure 3. Requirements expected to be most difficult**

One third to one fourth of the respondents assumes that they will be having some difficulties with meeting the cross-compliance requirements (Figure 3). 34.6% expect to meet some difficulties with good agricultural and environmental condition requirements, while 31.7% assume to face some difficulties with the compliance with environmental requirements; 29% of the respondents mention plant health requirements. The compliance with public and animal health requirements may represent some difficulties for one fourth of the respondents. The notification of diseases and animal welfare requirements were not relevant for the enterprises not involved in livestock breeding and therefore, they could not tell about the impact of the requirements. When speaking of areas of activity, 29% of pig breeding enterprises expected to face some difficulties with complying with the good agricultural and environmental condition requirements.

When categorised by type of enterprises, the private limited companies had more problems with environment and nature protection requirements as about half of the responding private limited companies mentioned either serious problems or some difficulties with this issue. 38.5% of private limited companies, 25.3% of sole proprietors were concerned with public and animal health requirements; 29.2% of private limited companies and 16.6% of sole proprietors were concerned with requirements for notification of diseases and 36% of private limited companies and 27% of sole proprietors, respectively, with animal welfare requirements. Large-scale producers were mostly concerned with notification of animal diseases and animal welfare issues.

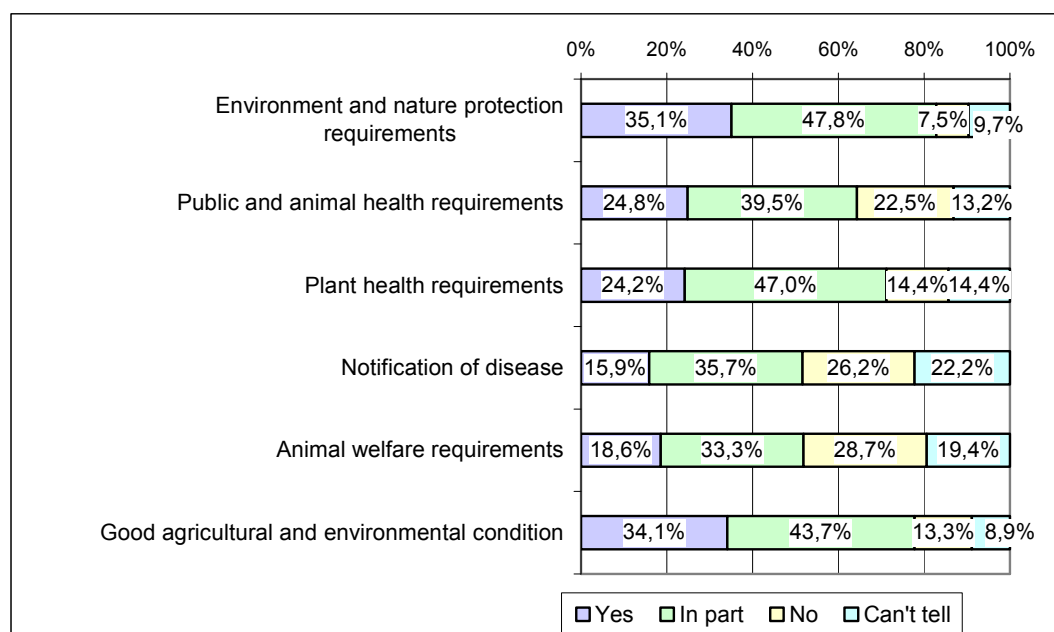
The following factors (Figure 4) are seen as the most complicated for the conformity with cross-compliance requirements: the major problem is the lack of funds for bringing production systems into conformity with the requirements (62.7%). 52% of the respondents saw the unreasonable scope of the requirements as the problem while lack of awareness is seen as the problem by 44.7% of the respondents. For 35.3% of the respondents, availability of advice concerning the new requirements was seen as the main obstacle. According to one third of the respondents, information regarding the requirements is not well available, while 27.8% mentioned poor availability of training and 8.7% of the respondents referred to other reasons, including:

- unreasonable requirements to producers manufacturing products of animal origin for their own consumption;
- unfavourable natural conditions (in cupulous areas);
- requirements for handling waste of animal origin;
- unstable nature of agricultural policy (requirements and conditions for granting aid);
- too frequent changing of requirements during the obligatory period;
- changing the requirements without giving any notification;
- lack of technology and equipment;
- differences in interpretation by complying and supervising entities.



**Figure 4. Factors contributing to problems for complying with the new requirements**

Private limited companies were mostly concerned with information: half of the respondents mentioned poor availability of the information and advice on the new requirements as the main problem; the same problems were highlighted by one third of the sole proprietors. 42.9% of private limited companies and 26.7% of sole proprietors mentioned bad availability of training. Lack of funds for investments was seen as the problem by 78.6% of private limited companies and 59.4% of sole proprietors. Limited investment capacities were seen as the major development obstacle by all the enterprises. Unreasonable scope of requirements was mentioned by 64.3% of private limited companies and one half of sole proprietors. The other types of enterprises mentioned fewer problems. Employees of enterprises required additional information/advice/training on mandatory management requirements for agricultural enterprises and good agricultural and environmental practice (Figure 5). Full or in-part training on environment requirements is also necessary; assume 82.9% of the respondents while the same requirements on good agricultural and environmental condition, plant health and public and animal health is required to be necessary by, respectively, 77.8%, 71.2% and 64.3% of the respondents. More than one fourth of the respondents did not require training on notification of animal disease and animal welfare requirements. Need for training on notification of disease and animal welfare requirements was mostly expressed by milk production, animal husbandry, combined production, pig and poultry enterprises.



**Figure 5. Requirement for additional information/advice/training on mandatory management requirements for agricultural enterprises and good agricultural and environmental practice**

Private limited companies mentioned more extensive training requirements regarding their employees. This result, once again, confirms the general training requirement evaluation in different spheres. For example, all the private limited companies mentioned either in part or full training requirement of their employees in the sphere of environment protection; while one fifth of the responding sole proprietors either could not provide an estimate or considered the training to be unnecessary. Sole proprietors mentioned training requirements of their employees more often with regard to animal welfare requirements.

## Conclusions

Granting of direct aid to agricultural producers shall be dependent upon the compliance of their production systems with the requirements to be implemented over the near years, including the mandatory management requirements – environment and nature protection, public and animal health, plant health, notification of disease, and good agricultural and environmental condition requirements. The results of the survey indicated that the producers are not fully aware of the new requirements and, while being partially capable of meeting the requirements with their current production systems, they hope that the situation shall improve in the future, and full or in part compliance with the requirements shall be possible in three years. Larger enterprises have better abilities than small-scale enterprises for bringing their production systems into conformity with the requirements. Lack of funds – but also insufficient information – is being seen as the major obstacle. Private limited companies are better aware of the training needs of their employees for bringing their production systems into conformity with the new requirements. Majority of the problems is expected to rise from environment requirements and good agricultural and environmental condition requirements, also dominating among the training requirements. Crop cultivating enterprises have, so far, being the most capable of complying with the requirements, according to their own estimates.

Clear picture of a producer's problem is required for the establishment of a successful training, information and advisory system. This is largely dependent on the producer and his/her general level of awareness. After specifying the producer's problem it will be possible to decide whether the problem can be solved by individual advice or training. It is very important to determine the target group when planning a training course. It would be unreasonable to spent resources and time for the

establishment of a very extensive advisory system for solving individual issues of specific nature as an advisor could never offer information or experience substantial enough. The best opportunity would be contributing to the contacts of agricultural producers with the researchers of appropriate field. For that purpose, the information system that is being updated on current basis needs to be established, providing the producers with information on consultations offered by specialists.

### References

1. Euroopa Liidu laienemine ja põllumajandus: riskid ja võimalused. Keskkonnajuht 1/2004. Tallinn 2004. [[http://www.foeeurope.org/agriculture/publications/E&A\\_national/Roheline\\_pollumajandus.pdf](http://www.foeeurope.org/agriculture/publications/E&A_national/Roheline_pollumajandus.pdf)] 12.12.2007.
2. Højring, K.; Hansen, L., Noe, E. (2004) Nature conceptions, management and cross-compliance in organic farming. *DARCOFenews*(2). [<http://www.darcof.dk/enews/june04/nature.html>] 05.12.2007.
3. Mann, S. (2005) Different Perspectives on Cross-Compliance. *Environmental Values* 14(2005): 471-482.
4. Silcock, P., Swales, V. (2007) Cross Compliance. A Policy Options Paper. 21 June 2007. [<http://www.lupg.org.uk/Default.aspx?page=115>] 15.12.2007.

## **Influence of Cows Keeping Way on Feed Making Expenses**

**Baiba Ošmane** Dr.agr., leading researcher;  
**Sallija Ceriņa**, assistant. Research Institute of Biotechnology and Veterinary Medicine “Sīgra” of Latvia  
University of Agriculture

### **Abstract**

Latvian farmers gradually pass over to the production of sustainable agricultural products, where the maximum and environment friendly use of agricultural lands as well as balanced and even feeding and welfare of cows are the determining factors. Producers are interested to increase income by increasing the amount of production and improving the quality of milk, at the same time decreasing milk production expenses. The aim of our research was to analyse economic aspects of grass feed production to develop profitable milk branch.

Two keeping and feeding variants of cows were analysed and compared during the study: 1) cows were fed in pasture at summer time and kept in cattle-shed (different feed) in winter time; 2) cows all the year round were in cattle-shed with free keeping way (uniform feeding). To ensure qualitative and profitable grass feed for cows throughout the year keeping in cattle-shed, it is essential to make the right choice of technology and organisation in all periods of grass feed making – from beginning with growing of perennial grasses, harvesting, conservation, and storage to feeding. In the first variant the providing of dairy cows with full value feed required 107 ha of grasslands area, while in the second variant the providing of dairy cows required 94 ha of grasslands area. The calculation of the expenses in both variants (if the expenses of different keeping and feeding ways connected only with feed obtaining for animals are evaluated) showed that the expenses were by 4.38% higher in the second variant for one animal per year. However the economy of land by 11.8% was obtained in the second variant in comparison with the first variant.

**Key words:** cows, way of keeping, feed, expensive

### **Introduction**

The economy of dairy farming is formed by biological genetical as well as economic factors for planning cows keeping, feeding and feed making technologies. To ensure high productivity and economically profitable milk production fed out feed ratio must be balanced according to the feed nutritive and energy. The above mentioned can be ensured by timely harvested and right conserved grass feed as well as rational use of land. Therefore to obtain qualitative grass forage the proper organisation of work and technologies in all forage production stages is essential - starting from growing of perennial grasses, harvesting, ensiling, storage and finally feeding out. For modern way of keeping cows (throughout the year uniform feed is fed out in cattle –shed) it will be necessary to prepare half as much silage to use agricultural lands rationally, and to ensure cows with high value uniform feed throughout the year.

Economically farmable production of feed depends on the assortment of grown plants and obtained yield, as more than half of milk prime cost is fed to animals in the farms. For dairy producers there are wide possibilities to decrease it, since 60-80% of the cows feed base is composed by cheaper feed – grass. Soil processing, grasses sowing and other expenses do not change the dependency on the grass yield per ha, yet the obtained amount of feed will change the provision of animals with feed. Maximum possible perennial grasses yield can be 60-75t per ha, but usually 35-45 t per ha are obtained on average. The existing land areas must be utilized completely as possible and grasses with yield must be used to obtain qualitative grass feed in the necessary amount. The studies show that we have to develop intensive and sustainable milk production, where an intensive use of each ha is based on the obtaining of high quality forage. References from abroad and the research carried out in local conditions (Adamovičs A.1999, Šeļegovska E. 2004, Woolford M. 2003) confirm that uniform feeding during the year with high quality feed has the highest economic efficiency in comparison with other kinds of feeding.

Hypothesis: the improvement of cows keeping and feeding system (throughout the year in cattle-shed fed with uniform feed) provides maximum use of agricultural areas and decrease of milk prime cost.

The aim of the research was to analyse economic aspects of grass feed production to develop more profitable milk branch.

Tasks of the research:

- 1) to compare and estimate grass feed production expenses of herd according to the keeping and feeding way;
- 2) to estimate the influence of cows keeping and feeding way on economic efficiency of the use of grass areas.

The analysis of references indicate that in Latvia there are no many studies done on the balanced feed use for dairy cows feeding throughout the year, and thus different changing factors influence milk production.

The research will focus on the analyses and comparison of two variants for cows keeping:

- 1) cows keeping on pasture in summer and in cattle-shed (test variant) in winter;
- 2) cows keeping in cattle-shed at free keeping, with providing balanced uniform feed (experiment). We evaluated the influence of keeping way directly on feed making expenses. In the experiment we worked with balanced and qualitative feed. We compared traditional feed (pasture in summer, silage and hay in winter) with a new feeding system (all year uniform feed).

We analysed the influence of both cows keeping variants on the economic efficiency of feed production and use of land areas.

## Results and Discussion

One of the main important tasks in animal feed production is to increase protein income from one hectare of perennial grasses. Grasses need suitable fertilization to increase higher content of crude protein (CP). We have to increase the amount of papilionaceae in grassland structure, grass has to be harvested of plants, more suitable growth stage demands of feed making technologies shall be noticed and grassland area shall be used at maximum completely. The study covered 50 dairy cows, 20 heifers and 20 calves kept in the farm.

The necessary amount of feed for one animal of Variant 1 group was calculated as follows: silage 55 kg per day, for 220 days in winter time; hay 4 kg per day, for 220 days in winter time, the concentrate feed 8.3 kg per day – throughout the year.

Table 1

**Necessary feed for 1 animal per year in Variant 1**

No.	Type of feed	For dairy cows (milk yield 6000 kg/year)	For calves till 6 months of age	For heifer and young cattle older than 6 months
1.	Silage	12.1	0.0	5.0
2.	Hay	1.0	0.5	0.8
3.	Concentrate feed	3.0	0.1	0.5
4.	Pasture grass	10.8	0.1	8.0

These data depended on the qualitative indices of feed making according to which the exact daily proportions were calculated (Table 1). In Variant 2 the number of animals did not change, the calculated feed proportion is the same throughout the year: silage 65 kg per day, hay 2 kg per day, concentrate feed 8.3 kg per day (all the year).

Table 2

**Necessary feed for 1 animal per year in Variant 2**

No	Type of feed	For dairy cows (milk yield 6000 kg/year)	For calves till 6 months of age	For heifer and young cattle older than 6 months
1.	Silage	24.0	0.0	9.0
2.	Hay	0.7	0.4	0.5
3.	Concentrate feed	3.0	0.1	0.5

By comparing both variants we can see that there are significant differences in the amount of pasture grass that in Variant 1 amounts to 10.8 t in period per 1 animal. The amount of silage in Variant 1 is by 50% less per 1 animal in year than in Variant. 2.

To provide herd with grass feed in Variant 1 it was necessary to manage 106.7 ha agricultural lands, i.e., 2 ha per one animal on average.

Table 3

**Necessary area for feed making of herd in Variant 1**

Nr	Feed	Necessary amount, t	Area, ha
1.	Silage	705.0	18.9
2.	Hay	76.0	18.8
3.	Concentrate feed	162.0	44.0
4.	Pasture grass	709.5	25.0
	Total	1652.5	106.7

Lands for concentrate feed and necessary amount of feed in both variants are invariable. Pasture areas are used for another type in Variant 2. Therefore Variant 2 requires increased land areas for silage making and slightly decreased areas for hay crops. In total 94 ha of agricultural land are needed in Variant 2.

Table 4

**Necessary area for feed making of herd in Variant 2**

No.	Feed	Necessary amount, t	Area, ha
1.	Silage	1380.0	37.0
2.	Hay	53.0	13.0
3.	Concentrate feed	162.0	44.0
	Total	1605.0	94.0

35 kg of seeds and 1 kg grass mixture seed with total costs of pay is LVL 2.8 are needed for the arrangement of 1 ha pastures.

Table 5

**Expenses for pasture arrangement in Variant 1**

Performed works	Expenses per 1 ha, LVL	Total area, ha	Total amount LVL
Autumn ploughing	35.0	25	875.0
Shambling in spring	22.0	25	550.0
Boulders taking away	30.0	25	750.0
Mixture of grass seeds	98.0	25	245.0
Fertilizers	80.0	25	2000.0
Fertilization	15.0	25	375.0
Sowing	40.0	25	1000.0
Total	320.0		8000.0

Expenses for arranging of one ha pasture equals to LVL 320. Arrangement of pastures is also expensive, in case the expenses are broken down for five years, because additional fertilization and maintenance of pastures are necessary. Since all grass areas are not arranged in farms in one year, it is important to know the expenses for 1 ha. The grasslands are arranged depending on the need for field in crop rotation. Every year up to 35 – 40% of the grass areas are renovated.

At present the grass yield harvesting in farms is provided with efficient technique in all cycles of grass making processes. Thus it opened new possibilities to grow perennial grasses in large areas, and to make qualitative grass feed for big herds and be independent from the summer climate.



Table 6

**Expenses for perennial grasslands arrangement in Variant 1**

Performed works	Expenses per 1 ha, LVL	Total area, ha	Total amount LVL
Autumn ploughing	30.0	38	1114.0
Shambling in spring	20.0	38	760.0
Boulders taking away	25.0	38	950.0
Mixture of grass seeds	68.0	38	2584.0
Fertilizers	75.0	38	2850.0
Fertilization	15.0	38	570.0
Sowing	27.0	38	1026.0
Rolling	15.0	38	570.0
Total	275.0		10450.0

The technological expenses of silage making include the arrangement and cultivation of grass areas, and expenses of silage production.

Table 7

**Expenses of silage making in Variant 1**

Performed works	Expenses per 1 ha, LVL	Amount	Total amount, LVL
Expenses for grasslands arrangement, ha	200.0	18.9	3780.0
Harvesting, ha	30.0	18.9	567.0
Collecting, cutting and rolling t (4,0 LVL/t <sup>-1</sup> )	4.0	705	2820.0
Pressing (400 t make in 4 days=96h, ≈ LVL 30 per day)	60.0	1	60.0
Total expenses			7227.0
Expenses per 1 t		705	10.25

Hay making is expensive and labour - consuming process. To produce higher value hay it is necessary to have a good climate conditions and rating technique that increase prime cost of hay production.

Table 8

**Expenses of hay making in Variant 1**

Performed works	Expenses per 1 ha, LVL	Amount	Total amount, LVL
Expenses for grasslands arrangement, ha	200.0	18.8	3760.0
Harvesting, ha	30.0	18.8	564.0
Collecting, cutting and rolling t (4,0 LVL/t <sup>-1</sup> )	15.0	18.8	282.0
Pressing (400 t make in 4 days=96h, ≈ LVL 30 in day)	35.0	18.8	658.0
Total expenses			5264.0
Expenses per 1 t		76	69.26

Different conditions of grass mass ensiling process (conservation quality, way, botanical composition of grass mass, plants stage of maturity) can cause losses of feed value. Harvesting losses on field are biggest to hay, but losses of storage – from fresh cut made grass silage. Therefore it is important to know the expenses of production to decrease the expenses of silage prime cost at maximum. The expenses of perennial grasslands arrangement are shown in Table 9.

Table 9

**Expenses for perennial grasslands arrangement in Variant 2**

Performed works	Expenses per 1 ha, LVL	Area total, ha	Total amount LVL
Autumn ploughing	30.0	47	1410.0
Shambling in spring	20.0	47	940.0
Boulders taking away	25.0	47	1175.0
Mixture of grass seeds	68.0	47	3196.0
Fertilizers	75.0	47	3525.0
Fertilization	15.0	47	705.0
Sowing	27.0	47	1269.0
Rolling	15.0	47	705.0
Total	275.0		12925.0

Arrangement of perennial grasslands areas did not differ in both variants. Total expenses on perennial grass areas have increased for hay and silage production on the account of eliminated pastures (Tables 10 and 11).

Table 10

**Expenses for silage making in Variant 2**

Performed works	Expenses per 1 ha, LVL	Amount	Total amount, LVL
Expenses for grasslands arrangement, ha	200.0	36.4	7280.0
Harvesting, ha	30.0	36.4	1092.0
Collecting, cutting and rolling t (4,0 LVL/t <sup>-1</sup> )	4.0	1380	5520.0
Ramming (400 t prepare in 4 days=96 h, ≈ LVL 30 per day)	120.0	1	120.0
Total expenses			14012.00
Expenses per 1 t		1380	10.15

Table 11

**Expenses for hay making in Variant 2**

Performed works	Expenses per 1 ha, LVL	Amount	Total amount, LVL
Expenses for grasslands arrangement, ha	200.0	13	2600.0
Harvesting, ha	30.0	13	390.0
Collecting, cutting and rolling t (4,0 LVL/t <sup>-1</sup> )	15.0	13	195.0
Ramming (400 t prepare in 4 days=96 h, ≈ LVL 30 per day)	35.0	13	455.0
Total expenses			3640.0
Expenses per 1 t		53	68.68

or pastures roads and enclosure is necessary about 3% from total pasture areas. Different crops growing land area increases in 2<sup>nd</sup> variant on the base of pasture roads in 1<sup>st</sup> variant.

Table 12

**Comparison of expenses in both variants**

Indicators	Variant 1	Variant 2
Expenses of feed for 1 animal, LVL	370.23	386.46
Necessary area for feed production, ha	106.70	94.00

It is seen from the data of Table 12 that feed production per one cow costs substantially less ( $p < 0.05$ ), i.e., by 4.38% in Variant 1 than in Variant 2. The necessary areas for feed production were substantially ( $p < 0.05$ ) less in Variant 2 in comparison with Variant 1, i.e., by 12.7 ha or the economy of land was 11.8%.

**Conclusions**

1. The comparison of both variants shows that feed making expenses are about 4.38% higher for one animal per year in Variant 2.
2. The economy of land for feed production to cows equalling to 11.8% is obtained in Variant 2 in comparison with Variant 1.
3. It is possible to make full rotation of crops in the farm thus having the possibility to obtain higher yields at the farms in general.

**References**

1. Adamovičs A., Driķis J. Zālāju sastāva un produktivitātes vērtējums tilpumainās lopbarības ražošanai // Latvijas lauksaimniecības zinātniskie pamati. Zinātniskā monogrāfija. LLU. Jelgavā, (1999), 64.-73.lpp.
2. Šeļegovska E., Piena ganāmpulka pāreja no vasaras uz ziemu. // Saimnieks. 8., (2004), 47-50. lpp.
3. Woolford M. Skābbarības gatavošanas tehnoloģija un zinātne // Alltech tehniskās publikācijas, Lielbritānija, (2003), 1.-55.lpp.

**Kopsavilkums****Govju turēšanas veida ietekme uz barības sagatavošanas izmaksām**

Latvijas zemnieki pakāpeniski pāriet uz ilgtspējīgu lauksaimniecības produkcijas ražošanu, kur noteicošie faktori ir platību maksimāla, bet videi draudzīga, izmantošana, govju sabalansēta un vienmērīga ēdināšana un labturība. Produkcijas ražotāju interesēs ir palielināt peļņu, kāpinot ražošanas apjomus un uzlabojot piena kvalitāti, vienlaicīgi samazinot tā ražošanas izmaksas.

Pētījumos tika izanalizēti un salīdzināti divi govju turēšanas un barības nodrošināšanas varianti:

1. Govis tiek laistas ganībās vasarā un ziemā turētas kūtī (atšķirīga barība);
2. Govis visu gadu atrodas kūtī brīvā turēšanas veidā (vienveidīga barība).

Lai nodrošinātu kvalitatīvu un ekonomiski izdevīgu zāles barību govīm visu gadu atrodoties kūtī, būtiska ir pareiza tehnoloģijas izvēle un organizācija visos zāles lopbarības ražošanas posmos – sākot ar daudzgadīgo zālāju audzēšanu, novākšanu, konservēšanu, uzglabāšanu un izēdināšanu. Pirmajā variantā, lai nodrošinātu 50 slaucamās govīs ar pilnvērtīgu un sabalansētu barību nepieciešams 107 ha zālāju platības. Bet otrā variantā – 94 ha. Salīdzinot abu variantu barības sagatavošanas izmaksas (ja izvērtē turēšanas un ēdināšanas dažādo veidu izdevumus, kas saistīti tikai ar barības nodrošinājumu dzīvniekiem) otrajā variantā barības izmaksas uz vienu dzīvnieku gadā bija par 4.38 % augstākas. Bet lopbarības sagatavošanai izmantojamās zemes platības ekonomija otrajā variantā bija 11.8 %.

Ieviešot saimniecībā ražīgus, dažāda agrārnuma pļaujamus, zālājus no tiem ir iespējams iegūt salīdzinoši augstāku ražu nekā no ganībām, līdz ar to atbrīvojas lauksaimniecībā izmantojamās zemes platība, vai rodas zemes ekonomija, no kuras var gūt papildus ienākumus.

## Opportunities for Raising the Labour Market Offerings in Latgale within the Framework of the Centres of Regional Meaning

Inese OZOLA, master of social sciences in management, lecturer  
Department of economics and management, faculty of economics, Rēzekne higher school,

### Abstract

Changing of the economic system, generations of people, and expansion of the integration in Latvia and especially in Latgale region play a great importance for the entrepreneurship element - labour resources or inhabitants. The economic system of inhabitants describes the ability to fit in labour market. The possibilities to find skilled labour increase both on European and Latvian as well as regional levels. But it is more and more difficult to find people in our country who would take this opportunity. Today, when people experience the processes of integration and the global questions are being solved, the person is not less important in labour market with the quality of his offering that includes qualification, competence, education and other indicators. Enabling the development of Latgale region, the special attention should be paid to the development of less developed areas, at the same time creating the opportunity for separate groups of people to improve their skills and offer themselves to the labour market; in the result it is possible to increase the prosperity level of people, especially in depressed areas.

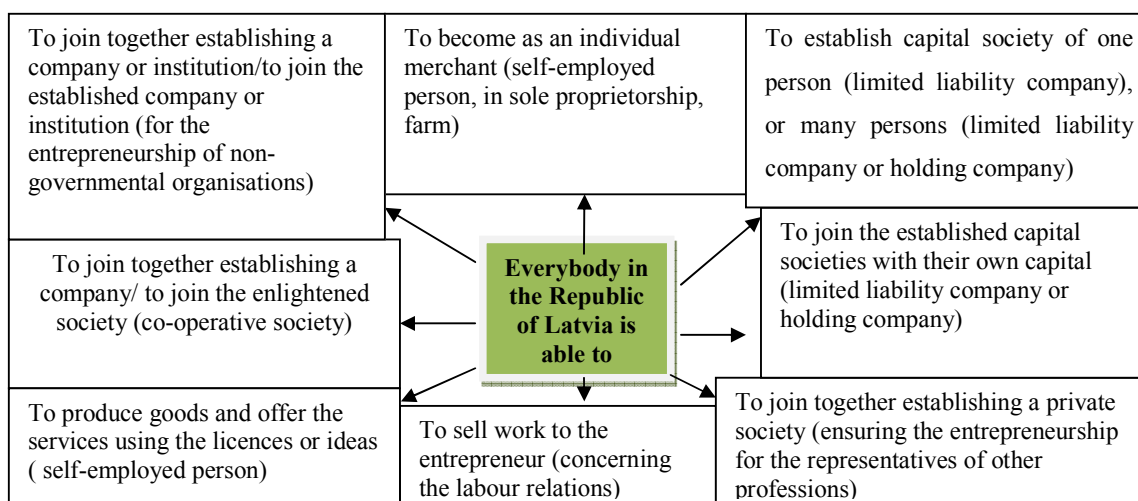
**Key words:** labour market, offer of the labour market, entrepreneurship, regional meaning centres, social risk groups

### Introduction

Development of business is very often related to the original decision of many socially - economic barriers: a gain of the economic activity, new jobs, and a gain of a total internal product, creation, and acceptance of new technological and industrial decisions. In Latgale the business and its environment after the declaration of independence is the element which is in the process of constant improvement, and all macroeconomic and microeconomic development of all the region and the state depends on it as a whole as well as balanced supply and demand of the labour market and economic strengthening of the centres of regional purpose. It forces to develop programmes and undertake other actions for the development of local labour market. On 1 May 2004 becoming a full member of the European Union (EU), Latvia shall consider also the rights and obligations of the EU in the sphere of employment. The European Advice in 2000 during the final meeting in Lisbon has laid down the aim – by 2010 to make the EU economy as the most competitive, economy based knowledge in the world, that, having accepted a call - at simultaneous growth of efficiency. **The object of the research** - offer of the labour market. **The aim of the research** - to analyse entrepreneurship, and to find out a demographic structure of the labour market offer within the limits of the centres of regional value - Latgale for its further improvement. **Research problems** – to provide the theoretical and practical review of business and the offer of the labour market; to give the present economic characteristics of the region of Latgale; to characterise and estimate the social status of labour within the limits of the centres of regional purpose, and to draw conclusions. **Methods of research** - monographic research, a method of marketing; qualitative and quantitative methods of sociological researches; the analysis of documents, a selective method interrogation - interview; statistical methods and a graphic method. **The hypothesis** - definition of structure for the offer of labour market within the limits of the centres of regional value is the key of opportunities to increase its competitiveness in Latgale.

### 1. Theoretical aspects of business and the offer of labour market

To provide manufacture or render service, business as the factor of manufacture is connected with association, co-ordination and combination of other factors - industrial resources, including labour (manpower). Today there are many opportunities for a person to start a business (Figure 1).



Source: developed by the author according to the laws of the Republic of Latvia

**Figure 1. The human facilities in The Republic of Latvia**

A person chooses for him/herself and for the satisfaction of the needs the most suitable variant. It is possible to act individually, and then the decision is to become an individual businessman, and if there is a desire to cooperate with adherents or experts in any certain direction or group, it is recommended to be united, having based a personal society. But some people choose only an opportunity to sell the work, thus, accepting taking part in the formation of the labour market offer. Different markets exist in the market economy. Labour market is one of them. This market is characterized by a supply and demand, where the enterprises or employers, on the one hand, operate, and on the other hand labour or those who are looking for job. Through the labour market, sales of a labour on certain terms are carried out. The market of a labour is a labour market - sphere of formation of labour supply and demand. Except these basic components, labour market comprises: cost of a labour, the price of a labour, a competition between employers and employees, employers and hired workers. As subjects of a labour market: employers and their representatives (unions), workers and their representatives (trade unions), in the state and its bodies: the Ministry of Labour and Social Protection of the population, departments, committees and departments on work and employment, etc. The external and internal, open and closed labour markets are distinguished there.

In the research the main attention is paid on the internal offer of the labour market in the region of Latgale; however that is inseparable from business which forms an economic basis of each state. It is necessary to emphasise that the economy of region and its labour market develop on special conditions.

## **2. The economic characteristic and activity of Latgale region within the frameworks of the regional value centres**

The law "On Regional Development" (March 21, 2002) defines that a regional development requires a lay-out, coordination and maintenance of cooperation of local managements in Latvia in 5 regions: Kurzeme, Vidzeme, Zemgale, Latgale and Riga. Observing the included principles of statistical territorial unit of the compliance qualifier of the EU, Latgale region, according to the Cabinet Regulations No. 271 of April 24, 2004, will comprise Balvi, Krāslava, Preiļi, Ludza, Rēzekne and district of Daugavpils with 12 towns and cities -Daugavpils and Rēzekne, and 138 regions with the total area of 14 557 km<sup>2</sup> (area of Latvia- 64 689 km<sup>2</sup>), where the area of large cities equals to 90 km<sup>2</sup>.

At the moment of the research the situation has changed – the region with 117 parishes has been formed in 6 regions (according to the Central Statistical Bureau of the Republic of Latvia 01.12.2007) as it was before: Balvi, Krāslava, Preiļi, Ludza, Rēzekne and Daugavpils district with 14 towns and the republican cities -Daugavpils and Rēzekne, both indicating the particular region, the area and number of inhabitants, where economic activity is performed by people. The territorial area of Latgale is rather big – it comprises the fourth part of the total area of Latvia (22.5%). At the beginning of 2006 the number of inhabitants in the

region made the fifth part of the population of Latvia (15.7%). About 365 thousand inhabitants on average live in the region, with the density of 24.7 inhabitants on 1 km<sup>2</sup> in the territory of the region, yet it is not the lowest in the state (still lower is observed in Vidzeme – 15.9% and Kurzeme – 22.7%) (according to the Central Statistical Bureau the Republic of Latvia 01.09.2007). The statistics show the reduction tendency of inhabitants. In recent years it ranges between 382 159 (2001) and 369 000 (2006) persons (in Latvia- 2 331 480 and 2 294 590 respectively). Proportionally comparing the parameter of 2001 with 2006 the reduction by 3.5% is observed. The concentration of inhabitants is observed in 2 large cities with the tendency to increase (40.1%-2001 and 41%-2005), while reduction is observed in villages- (42.9% in 2001 and 41.9% in 2005), in the other 12 towns - on average 17.2% of the total number of region inhabitants, forming the average density of inhabitants like 1718 persons on 1 km<sup>2</sup> in large cities (It is calculated by the author according to the Central Statistical Bureau of the Republic of Latvia). The economic development of Latgale to a great extent depends on the structure created during the Soviet times, and this process considerably differs from the activity of the strongest region-Riga.

From 2005 to 2006 active business in Latgale is carried by 3775 enterprises, and it is conducted on the average societies of business (Table 1). Also the gain of the general number of the previous period is observed: relatively- 178 units. Distribution by types of activities is done by the types of business classified according to the international standards. In the studied period the number of business societies according to the types - wholesale trade, retail trade and other types of economic activities has decreased: relatively «-4» and «-11». The vigorous activity – according to the types, and with the greatest relative share of the general business, for example, is seen in hotels and restaurants (47.5%), a manufacturing industry (15.5 also 14.7%) and transactions with the real estate, rent and other commercial action (9.7%). Having examined the occupied places in Latgale and opportunities for their development, it is necessary to estimate their ability to carry out certain functions within the limits of political structures.

**Table 1**

**Arrangement of active enterprises and business entities according to the aspects in Latgale in 2005 – 2006 (number/ %)**

Indicators	2005	2006		Difference comparing with the previous period (number)
	number	number	proportion of total number, %	
Enterprises and business entities	3686	3864	100	178
Agriculture, hunting, forestry and fishery	120	134	3,5	14
Manufacturing	554	599	15,5	45
Processing industry	517	569	14,7	52
Building	171	196	5,1	25
Hotels and restaurants	1801	1834	47,5	33
Wholesale trade, retail sales: auto, car, products of individual using, maintenance of household goods	161	157	4,1	- 4
Transporting, storage, communications	232	290	7,4	58
Real estate, renting and other commercial operations	359	377	9,7	18
Other types of economic operations	288	277	7,2	- 11

Source: made by the authors

Taking for a basis the desirable levels of the main centres of the population that corresponds to “the project of the Rule about the centres of the population of the state territory (2004)”, developed by the Ministry of Regional Development and affairs of local management, the centres of national value (large cities), the centres of regional value (city and settlements), the centres of local value (settlements), the local centres and other populated places are envisaged. Depending on potentially populated centres and belonging to any of these levels, economic activity is performed. To provide an optimum effect, it is necessary to have

a specific role of each centre. The research puts forward and characterises the centres of regional value. The centres of regional value are administrative centres of rural areas (Balvi, Kraslava, Preili, Ludza, and Livani), which are the significant centres of culture and manufacture with the developed social infrastructure. Their potential exceeds the potential of small cities of other regions. In addition to each city, its role that defines distribution, achievement and resources, is emphasized. The centres of regional value have a certain role at the regional level. Therefore it is important to understand their actual tendencies of development. For the analysis, supervision and interrogation to receive representation, concerning economic activity from the above mentioned five centres of regional value, three are chosen: Balvi, Preili and Ludza, with definitely identical number of the operating enterprises, which will be taken into consideration in the further research. *Balvi* is a town in the North - East part of Latvia, the Northern town of Latgale, which has not reached 100 years anniversary. It is characterized as one of the youngest towns in economic and social development at the level of state. It covers not so large area of the city, for example, 5.1 km<sup>2</sup> or 508.7 hectares. The average density of inhabitants on 1 km<sup>2</sup>- 1581 persons (calculations of the author on statistical data of Balvi, 02.04.2007). *Ludza* - for the first time it is mentioned in the ancient Russian chronicles (Kiev and Ipatevsk) in 1177. In the first quarter of the 19<sup>th</sup> century the strong value of trade increased in Ludza, in 1896 - 242 trading and industrial enterprises (it is summarised by the author on historical data of Ludza Council, 02.05.2007). After the World War II many industrial enterprises were built and operated in Ludza. The largest ones were the enterprises of metal working, flax, meat and dairy processing. Today the town is similar to the town of Balvi. *Preili* as a name for the first time is mentioned in 1348. In 1928 Preili received the rights of the town. Rapid growth of the town has begun in 1949 when Preili became as the regional centre. Based on the Law passed on October 21, 1998 on the administrative - territorial reform, the cooperation agreement has been signed between the town of Preili and the following districts - Aizkalne, Peleci, Preili, Rudzati, Rusona, Sauna, Silani and Sutri. It served as a further decision for establishing of district on October 24, 2000 "On establishment of Preili district".

**Table 2**

**The number of enterprises and their proportion in the national economy of Balvi, Ludza, Preili and Preili district at the beginning of 2006 (units %)**

Sector	Balvi		Ludza		Preili district		Preili	
	Enterprises	% proportion	Enterprises (unit)	% relative share of the total number	Enterprises (unit)	% Relative share of the total number	Enterprises (unit)	% of relative share of the total number
Total	130	<b>100</b>	134	<b>100</b>	127	<b>100</b>	64	<b>100</b>
State and self-administrative	30	<b>23*</b>	38	<b>28*</b>	6	<b>5*</b>	3	<b>5*</b>
Trade	28	<b>21*</b>	25	<b>19*</b>	45	<b>35*</b>	21	<b>33*</b>
Financial	15	<b>12*</b>	19	<b>14*</b>	12	<b>10*</b>	8	<b>13*</b>
Constructive	4	<b>3*</b>	20	<b>15*</b>	8	<b>6*</b>	4	<b>6*</b>
Other services	30	<b>23*</b>	7	<b>6*</b>	17	<b>13*</b>	9	<b>14*</b>
Workmanship	1	<b>1</b>	3	<b>2</b>	8	<b>6</b>	3	<b>5</b>
Producing	14	<b>11</b>	14	<b>10</b>	19	<b>15</b>	9	<b>14</b>
Other sectors	8	<b>6</b>	8	<b>6</b>	12	<b>10</b>	7	<b>10</b>

Source: summarised by the author on the statistical data of Balvi Council, 02.04.2007;

Summarised by the author on the statistical data of Ludza Council, 05.06.2007; Preili Council and local management of Preili district, 15.05.2007

\* - sphere of services

The incorporated local management covers the area of 157.8 km<sup>2</sup>, int. al., the town - 5 km<sup>2</sup> (calculations of the author on statistical data of the Preili Council and local management).

In 2006 a statistical parity of number of the enterprises and relative density of business on sectors of the national economy in the centres of regional value were done (Table 2). The data of Table 2 show an

overweight of relative density of sphere of services above other spheres of the national economy, for example, 82% in Balvi and Ludza, and also 69% - in Preili district with 71%- relative density of Preili town.

This sphere is the basic sector in the field of business, which provides the majority of jobs and it means - stability of income for population. Development of activity of the working population "other sectors" by relative share of the total number - 6% (Balvi and Ludza - each), 10% (Preili district and Preili) is observed. It is one of the simplest forms of carrying out the legal business, and there is no branch of financial resources from the personal means. The basic occupations of the employed persons are: vegetable growing, floriculture, workmanship, service of household, medical services and beauty parlour and other. Preili district, including Preili town – is the economic base in the territory for the enterprises, which are located both in the town and in all districts. The analysis of data specifies that the majority of the largest enterprises is concentrated in the town - it is 50.4%. It demonstrates an advantage of business in the centres of the formed regional territories.

### **3. The characteristics and estimation of labour activity within the frameworks of the centres of regional purpose**

For the expanded characteristics the author further considers and draws conclusions on labour (working) resources in the centres of regional value according to Table 3. The given situation is chosen with the purpose to display the number of inhabitants from a view of demographic distribution on the age of working capacity.

**Table 3**

#### **Working resources of Balvi, Ludza and Preili district in the beginning of 2006 (number of inhabitants / %)**

Indicators	Balvi		Ludza		Preili district	
	inhabitants	proportion %	inhabitants	proportion %	inhabitants	proportion %
Total:	8042	100	9883	100	10178	100
-men	3636	45.2	4389	44.4	4658	45.8
-women	4406	54.8	5494	55.6	5520	54.2
Under the age of working capacity (till 15 years)	1110	100	1262	100	1431	100
of the total number of inhabitants		13.8		12.8		14.1
-men	552	49.7	630	49.9	745	52.1
-women	558	50.3	632	50.1	686	47.9
On the age of working capacity (from 15 up to 62 year for men, 61 years for women)	5475	100	6585	100	6826	100
total number of inhabitants		68.		66.6		67.1
-men	2633	48.1	3120	47.4	3286	48.1
-women	2842	51.9	3465	52.6	3540	51.9
According to the age of working capacity	1457	100	2036	100	1921	100
total number of inhabitants		18.1		20.6		18.8
-men	451	30.9	639	31.4	627	32.6
-women	1006	69.1	1397	68.6	1294	67.4

Source: summarised by the author on the statistical data (01.01.2007.)

For the supervision of concrete time - the beginning of 2006 the statistical accounting of one of the centres of regional purpose – Preili district was chosen. The calculations show rather identical tendency in all



centres of regional value: inhabitants "under the age of working capacity" range between 12.8 and 14.1 % of the total number of inhabitants. It is possible that in the near years the labour market will gradually fill up. It allocates that the category which today is in a turn of the labour market offer, and thus makes the majority of economically active inhabitants and specifies potential of a labour. The population of the age from 15 up to 62 (an interval – 66.8 – 68.1%), and inhabitants "over the age of working capacity" makes an interval from 18.1 up to 20.6%. The calculations show that the last parameter is more than addition of a parameter "under the age of working capacity", the accelerated ageing of working resources is observed. Thus on the whole in Latvia this parameter with small reduction and an explanation to this – the change of age of able-bodied population is connected with the average changes at a pension age. It is necessary to pay attention to the characteristics of the internal labour market from the social status, as an enterprise resource - labour. The cumulative labour offer is the offer covering labour among economically active population. The cumulative offer of a labour develops under the influence of demographic, socially-psychological, ethnic, cultural and religious factors, and labour activity of the population. It is necessary to pay attention to the characteristic of the internal labour market from the social status, as of an enterprise resource - labour. The cumulative labour offer - the offer covering labour from among economically active population. In the research the interrogation by interview is held, and one indicator - the social status which brightly comes to light in the internal labour market for today (Table 4) is generalised. To receive the primary information and representation on the social status during the research, the interrogation by interview was held to such questions: «your socially – demographic status at present?» and «what kind of help is needed for the high-grade participation in the labour market?». The number of respondents in each centre of regional sense: inhabitants - in the interval from 3500 to 5500 persons of the total number of inhabitants, using the stratification choice, where the general whole homogeneous parts by a principle of accident, are allocated. The answers were received, using the interview - personal contact and resources of the Internet. Supervision and calculations of the first question (Table 4) show a rather identical situation: the group "inhabitants of risk groups" is allocated. In the centres of regional value on relative density a parameter of this group varies between the interval from 32.9 to 33.2% of the total number of inhabitants and in an interval from 48.8 to 49.6% of the total number of economically active inhabitants. It specifies 1/3 part in the first case and almost ½ part in the second case, the working resources with specific needs and opportunities. In this category on interrogation and according to the document of the State Programme (doc. GP 60 p.) enter such socially - demographic groups: unemployed, people of pre-retirement age, lonely people, mothers having many children, mothers/fathers after the child care leave, disabled and individuals after departure.

**Table 4**

**Inhabitants of risk groups in Balvi, Ludza and Preiļi districts at the beginning of 2006  
(number of inhabitants / %)**

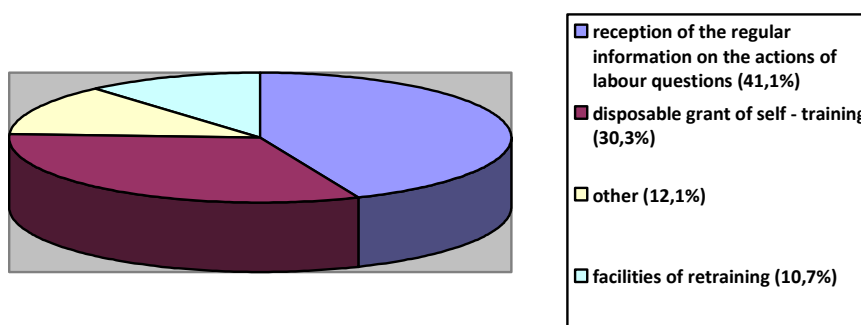
Indicators	Balvi		Ludza		Preiļi district	
	Inhabitants	Relative share of %	Inhabitants	Relative share of %	Inhabitants	Relative share of %
Total:	8042	100	9883	100	10178	100
Economically active	5475	68.1	6585	66.6	6826	67.1
Risk group inhabitants*	2673	-	3255	-	3384	-
- of total number of inhabitants		33.2		32.9		33.2
- of total number of economically active inhabitants		48.8		49.4		49.6

\*-Data are summarised by the author from the interview.

Source: it is summarised by the author on the statistical data and the interview (01.10.2007.)

This status or belonging to any of the above mentioned groups reduces work capacity of the individual, the condition allowing the person without health damage to perform certain work, during that time - work capacity forms the basis of labour of each individual and distinguish the general, professional

and special capacity of work. People from the group of risk demand specific approach to start the participation in the labour market.



Source: summarised by the author of the questions - interview (10.11.2007)

**Figure 2. The share of popular answers to the question: "What kind of help is needed for the high-grade participation in the labour market?" (%)**

Supervision and calculations of the second question (Figure 2). The summarised answers show not only on frequency, but also on an opportunity to which it is necessary to pay attention for increase of the labour market offer. 41.4% of respondents consider that the receipt of regular information on the actions of labour issues (seminars, training on different aspects), the most important is that the person could define the way of well-being. Also the disposable grant of self-training and in the further and the participation in the labour market in a new quality is considered as the very first help (30.3%). Now appreciable discrepancy between the offer of a labour and demand is observed on the labour market of Latvia. Work of 52% of Latvian inhabitants is not connected with the received formation, 24% or each fourth inhabitant somehow is connected with one of displays of illegal employment, and it is only some of the conclusions made by the Ministry on the population within the limits of research of a situation on a local labour market (the Review of National Development 2004-2005). Characterizing the factor of working potential in Latgale, it is necessary to mention geographical and territorial features of an arrangement. The region of Latgale is located in the East of the state. It simultaneously passes and borders the Russian Federation, Republic of Belarus, and in the south- the Republic of Lithuania. The site is very favourable for the interstate transit on favourable conditions and interstate level. In the West it borders with the regions of Zemgale and Vidzeme. Latgale is characterized by the need of inhabitants to be self-employed persons. It is shown in the research "On Ability in Regions 2005" with the acknowledgement of respondents-27% that is the highest parameter in the above mentioned interrogation among the inhabitants of regions (the Review of National Development 2004-2005). The present situation in Latgale is characterized by the fact that people do not have enough knowledge on principles of the free market activities and opportunities. There is no motivation of self-improvement. According to the opinion of experts, it is an additional risk factor for the labour market in Latvia as a whole and its regions - the quantity of not qualified and unmotivated potential workers could increase. The performed interrogation in the research plans of the labour market offer under the social status in the centres of regional value in Latgale shows that it is possible and necessary to work henceforth for improvement of opportunities to increase the labour market offer and the opportunities of information channels for involving all the population in increase of competitiveness of the individual in the labour market shall be used.

### **Conclusions, proposals, recommendations**

The research gives a basis to conclusions that the achievement of high employment rate could be mentioned as one of the major problems of the state macroeconomic policy.

Today many opportunities are given to any person to join business, and everyone may choose for him/herself and for satisfaction of the needs, the most suitable-work in business or offer the work.

In the market economy different markets exist, the labour market is one of them. This market is characterized by a supply and demand, where on the one hand, the enterprises or employers operate, and on the other hand there are labour or work searchers.

Observing the included principles of statistical territorial units of the EU compliance qualifier, Latgale region according to the Cabinet Regulations No. 271 of April 24, 2004, will comprise Balvi, Krāslava, Preiļi, Ludza, Rēzekne and district of Daugavpils with 12 towns and cities -Daugavpils and Rēzekne, and 138 regions with the total area of 14 557 km<sup>2</sup> (area of Latvia-64 689 km<sup>2</sup>).

The populated territorial area of Latgale is not small - it covers the fourth part of the total area of Latvia (22.5%). The number of inhabitants in the region at the beginning of 2006 formed the fifth part of the population of Latvia (15.7%). About 365 thousand inhabitants live in the region on average, with the density of 24.7 inhabitants on 1 km<sup>2</sup> in the territory of the region. The statistics show the reduction tendency of inhabitants. In recent years it ranges between 382 159 (2001) and 369 000 (2006) persons (in Latvia- 2 331 480 and 2 294 590 respectively). Proportionally comparing the parameter of 2001 with 2006 the reduction by 3.5% is observed.

From 2005 to 2006 active business in Latgale is carried by 3775 enterprises, and it is conducted on the average societies of business. The vigorous activity – according to the types, and with the greatest relative share of the general business, for example, is seen in hotels and restaurants (47.5%); a manufacturing industry (15.5 also 14.7%) and transactions with the real estate, rent and other commercial action (9.7%).

According to the project "Rules on the centres of the population of the state territory" (2004), the Ministry of Regional Development and affairs of local management envisage the centres of national value (large cities), the centres of regional value (city and settlements), the centres of local values (settlements), the local centres and other populated places. The research puts forward and characterises the centres of regional value, administrative centres of rural areas (Ludza, Kraslava, Preili, Balvi and Livani), which are the significant centres of culture and manufacture with the developed social infrastructure. In the research for the analysis, supervision and interrogation to receive the representation, concerning an economic activity three centres of regional value with definitely identical number of operating enterprises are chosen: Balvi, Ludza and Preili.

In 2006 the statistical parity of number of the enterprises and relative share of business in the sectors of the national economy in the centres of regional value, probably shows the overweight of relative share of sphere of services above the other spheres of the national economy, 82% in Balvi and Ludza; 69% - Preili district and 71% in Preili. The development of activity of working persons of "other sectors" by relative share of the total -6% (Balvi and Ludza), 10 % (Preili district and Preili) is observed.

The characterization of a manpower – at the beginning of 2006 when the statistical accounting of one of the centres of regional value – Preili district was begun, shows a rather identical tendency in all centres of regional meaning: inhabitants "under the age of working capacity" range in an interval from 12.8 to 14.1% of the total number of inhabitants. It allocates that the category which today is in a turn of the labour market offer, and thus makes the majority of economically active inhabitants and specifies potential of a labour. The population of the age from 15 up to 62 (an interval – 66.8 – 68.1%), and inhabitants "over the age of working capacity" makes an interval from 18.1 up to 20.6%. The calculations show that the last parameter is more than addition of a parameter "under the age of working capacity", the accelerated ageing of working resources is observed.

The interview in the research covers one indicator - the social status which brightly comes to light in the internal labour market for today, and also is an opportunity where it is necessary to pay attention to it, first of all for the increase of labour market offer - improvement of information streams concerning work. The number of respondents in each city: inhabitants - in the interval from 3500 to 5500 persons of the total number of inhabitants, choosing from the general homogeneous parts by a principle of contingency is allocated. The answers are received using the interview - personal contact and resources of the Internet.

Supervisions and calculations show rather identical situation: "inhabitants of risk groups" in the centres of regional purpose on relative share varies in the interval from 32.9 to 33.2% of the total number of inhabitants, and in the interval from 48.8 to 49.6 % of the total number of economically active inhabitants. It specifies 1/3 part in the first case and almost 1/2 part in the second case that working resources with specific needs and opportunities exist.

In this category of interrogation and according to the Government document of the Programme (doc. GP 60.p.) socially - demographic groups enter, which correspond to the concrete status, pages 8 and 9. This status does not reduce work capacity of the individual, for example, the condition allowing the person without damage to health, to perform certain work, at the same time - work capacity makes a basis of labour of each individual and distinguish the general, professional and special work capacity. People representing the group

of risk, demand specific approach in preparation to start acting in the labour market. The held interrogation in the research plans of the labour market offer under the social status in the centres of regional value with Latgale where it is possible and necessary to work henceforth for the improvement of opportunities to increase the labour market offer and use opportunities of information channels in it to involve all the population in increase of competitiveness of the individual in the labour market.

The supervision demonstrates that offers of work in the market by the centres of regional value and in the region of Latgale, labour makes the most part of inhabitant groups of social risk, therefore it can be approved that the possible potential for the growth of the labour market offer depends on their readiness to offer skills and work capacity. One of the major criteria is formation, vocational training and training for a new profession, to which the respondents pay attention.

As a result of the offer:

To form joint working group for coordination concerning the issues of a high-grade situation and development of actions for the improvement to increase the labour market offer in region and continuing cooperation for the development of the general system and a technique on research of the labour market offer for the development of the programme of work motivation, from the formed public organisations, which carry out many projects and programmes for contribution of business ((for example, the Fund of Integration, the Centre of Supporting the Employers, the State Agency of Regional Development, Agency for Especially Supported Regions).

To organize regular and rational information stream between the employers and the population for the definition of problems and needs of mutual aid.

To continue the research of business and its development tendencies in Latgale region for the high-grade and qualitative ascertaining of its situation and demand for working resources, to develop concrete actions in the sphere of formation (developing corresponding programmes and methods of formation).

To develop offers (training, social guarantees, life conditions) by opportunities to increase the labour market offer according to the demand and its requirements, involving local residents from group of social risk, having implemented activity of business as an example of the centres of regional value.

## **References**

1. Latvijas tautsaimniecības attīstības ziņojums, Ekonomikas ministrija, 2003, 67 – 72 lpp.
2. Latvijas tautsaimniecības attīstības ziņojums, Ekonomikas ministrija, 2004, 68 – 71 lpp.
3. Latvijas tautsaimniecības attīstības ziņojums, Ekonomikas ministrija, 2005, 69 – 73 lpp.
4. Latvijas racionālās attīstības apskats 2004/2005. Rīga, SIPI, 2005, 178 lpp.
5. Gratone, L., Cilvēkresursu stratēģija. Jumava, 2004, 282 lpp.
6. Ekonomika [01.01.2007., 02.04.2007.]: Pastāvīgo iedzīvotāju skaits, pieejams:<http://www.csb.gov.lv>.
7. Ekonomika [01.09.2007.]: Iekšzemes kopprodukts, pieejams:<http://www.csb.gov.lv>.
8. Iedzīvotāji [01.05.2007.]: Iedzīvotāju blīvums, pieejams:<http://www.csb.gov.lv>.
9. Единый документ программы государства [15.05.2007.] pieejams:<http://www.em.gov.lv>.
10. Statistika [26.08.2007.]: Ekonomiski aktīvie uzņēmumi, pieejams:<http://www.em.gov.lv>.
11. Statistika, informācija [01.01.2007.] [www.lursoft.gov.lv](http://www.lursoft.gov.lv)
12. Normatīvie akti [Skat.01.05.2007.] [www.ur.gov.lv](http://www.ur.gov.lv)
13. Iedzīvotāji. Uzņēmējdarbība [02.04.2007.] [www.balvi.lv](http://www.balvi.lv).
14. Pilsēta. Pilsētas uzņēmumu [05.06.2007.] [www.ludzaspils.lv](http://www.ludzaspils.lv)
15. Preiļu novads. Uzņēmējdarbība [15.05.2007.] [www.preili.lv](http://www.preili.lv)
16. Npublicētie Balvu pilsētas domes materiāli
17. Npublicētie Ludzas pilsētas domes materiāli
18. Npublicētie Preiļu padomes materiāli

## The Profile of Agriculture and its Largest Enterprises in Latvia

Irina Pilvere,

Dr.oec, professor, Dean of the Faculty of Economics, Latvia University of Agriculture

[Irina.Pilvere@llu.lv](mailto:Irina.Pilvere@llu.lv)

### Abstract

After Latvia's accession to the European Union (EU), agricultural sector has been seeing changes not only in Latvia, but also in other EU Member States (MS). In the research paper, the author analyses the main descriptive indicators of agriculture in Latvia over the last five years. It is concluded that the steady support amount increase in 2004 and 2005, as well as its stabilization in the following years 2006 and 2007, has promoted the development of all the main descriptive indicators of agriculture; especially this trend is manifested in revenue and labour productivity. In addition, the structure of agricultural holdings has been analysed leading to the conclusion that 61% of the total number of holdings does not produce goods for the market, and the largest proportion of these holdings are situated in Lielrīga [Greater Riga], Austrumlatgale and Ziemeļaustrumi regions. The research paper provides the analysis on 100 largest agricultural enterprises for the following characteristic indicators: geographical location, sectors of agriculture they operate in, the land areas managed, turnover, the amount of received support, profitability and cost/benefit efficiency.

**Key words:** agriculture, enterprises, indicators

### Introduction

Subsequent to Latvia's accession to the European Union (EU), important changes have taken place in agriculture due to the availability of different new types of support within the framework of the Common Agricultural Policy (CAP). Side by side with Latvian agriculturists, these opportunities were used also by the representatives of agricultural sector of other Member States, especially the new Member States. For Poland, for instance, the accession was a tremendous achievement. Although Poland had already benefitted from the pre-accession support payments (PHARE, SAPARD), the accession however allowed its agriculture and rural areas to speed up the development following the same path as, for instance, Ireland and Spain (Mejszelis M., Mickiewicz P., 2007). In Lithuania, the membership of the EU is the most powerful drive of innovations in the country and an impetus to accelerated development opportunities (Atkočiūniene V., Petrauskienė R., Tījūnaitienė R., 2007). The availability of the European Structural Funds became the main instrument, causing positive changes in the agriculture of Portugal after its integration into the EU. The EU support has allowed to reduce the number of employees in the sector of production of the primary agricultural products and generated new jobs outside agriculture (Piecuch J., 2007). In Germany, on the other hand, the rural areas and agriculture have been gradually developing through centuries adapting to different shifts and changing development levels. The current changes in economic and social conditions have given rise to structural alterations in living conditions of the rural areas against the background of the agricultural sector undergoing decline of its leading role already since the middle of the 20<sup>th</sup> century (Hilgers Y., Nolten R., 2007). Competitiveness and sustainability are two main key-words of the contemporary agricultural and rural development in Estonia (Nurmet M., Lemsalu K., 2007). In the context of the EU single market conditions, the goods, services, labour and competitiveness of production on the EU level play a decisive role also in Latvian agriculture. It is critical for the Latvian agriculturists to ensure effective production and a relevant level of costs (Vēveris A., Leimane L., Krieviņa A., 2007). Therefore it is necessary to find out what if any changes have taken place in the agriculture of Latvia in recent post accession years; consequently the **aim of this research paper** is the analysis of the main and representative indicators of 100 largest agricultural enterprises of Latvia<sup>32</sup>.

The following **objectives** are subordinated to the above aim:

---

<sup>32</sup> According to the turnover level of 2006.

- 1) evaluation of the development trends in agriculture over the last 5 years;
- 2) analysis of the main representative indicators of agricultural holdings;
- 3) analysis of the main indicators of the 100 largest agricultural enterprises in Latvia, and their comparison with the overall indicators of the whole sector.

For the achievement of the above set **objectives** the methods of analysis, statistical account, synthesis and logical construction have been **applied** in the research.

For exploration of the issue, the overall indicators of the agricultural sector have been utilised making use of the data provided by Latvian Central Statistical Bureau (CSB), Annual Reports on Agriculture prepared by the Ministry of Agriculture (MOA) and the information of Rural Support Service on support payments. For studies and analysis of the agricultural enterprises, the data in the 100 largest Latvian agricultural enterprises<sup>1</sup> compiled by S. Diedziņa and D. Skreija, reporters of the daily paper *Dienas Bizness*, were used by the way of, both, reciprocal analysis and comparison as well as comparing them with the country average indicators, and, where possible, also with the data of Economic Accounts for Agriculture<sup>33</sup> (EAA) of 2006 prepared by the CSB and Latvian State Institute of Agrarian Economics.

The studies of situation in agriculture by other authors: Mejszelis M., Mickiewicz P., 2007, Atkočiūniene V., Petrauskienė R., Tijūnaitienė R., 2007, Piecuch J., 2007, Hilgers Y., Nolten R., 2007, Nurmet M., Lemsalu K., 2007, Vēveris A., Leimane L., Krieviņa A., 2007 have been used for the sake of discussion.

The data on agricultural holdings are grouped into the territorial cross-section of regional offices of Rural Support Service (RSS). RSS operates 9 regional offices each governing a definite administrative area of the country (RSS, 2007): Austrumlatgale (comprising districts of Rēzekne and Ludza), Dienvidlatgale (Daugavpils, Krāslava and Preiļi districts), Viduslatvija (Jēkabpils and Madona districts), Ziemeļaustrumi (Gulbene, Balvi and Alūksne districts), Ziemeļvidzeme (Valka, Valmiera, Cēsis and Limbaži districts), Lielrīga (Aizkraukle, Ogre and Rīga districts), Zemgale (Bauska, Dobeles and Jelgava districts), Ziemeļkurzeme (Talsi, Tukums and Ventspils districts) and Dienvidkurzeme (Liepāja, Kuldīga and Saldus districts).

## Results and Discussions

### 1. Profile of Agricultural Sector in Latvia

For featuring the agricultural profile, the author has selected several important indicators from different sources: aggregate characterizing indicators of the sector from MOA, EAA data and RSS information on the amounts of support that are summarised and analysed in Table 1.

The indicators reflected in Table 1 can be divided into two periods:

- pre-accession to the EU: 2002 - 2003;
- post-accession to the EU: 2004-2006.

Comparing the base increase indicators in Table 1, it is evident that the support amount increase has outpaced the increase rates of other indicators multiple times. The indicator of the employed in agriculture is however decreasing although slowly, which, alongside with the increase of production value, ensures a double increase in labour efficiency. The fastest growth of the chain increase is shown by the support amount just after the accession, in 2004-2005, while in 2006, the support amount is already lower than that the previous year. Looking at the support amount paid out in 2007, (LVL 191. 8 million) (RSS, 2007) one can see that despite the large variety of the local public and the EU support measures, the total support amount disbursed per year decreases. Due to both, availability of support and price changes in all main agricultural sectors, the total aggregate indicators of agricultural development should be given positive evaluation and many of them tend to approximate to the average EU level.

---

<sup>33</sup> Economic Accounts for Agriculture: evaluated for agricultural sector as the whole, through assessment of data for the whole sector on the production volumes, their utilisation, prices, support, production costs and redistribution of income (MOA, 2007, p.10)

Table 1

## Main indicators of agriculture in Latvia for the period of 2002-2006

Indicators/ years	2002	2003	2004	2005	2006	2006/ 2002 %
Agriculture and hunting added value in current prices (mill.) LVL <sup>34</sup>	132.6	133.7	181.7	198.5	224.9	170
<i>chain increase %</i>	<i>X</i>	<i>101</i>	<i>136</i>	<i>109</i>	<i>113</i>	<i>x</i>
Share of agriculture and hunting added value/ share in the total GDP in current prices (%)	2.6	2.3	2.7	2.6	2.3	88
<i>chain increase %</i>	<i>x</i>	<i>88</i>	<i>117</i>	<i>96</i>	<i>88</i>	<i>x</i>
Employed in agriculture and hunting (thousand)	112.3	104.4	97.0	87.8	88.4	78
<i>chain increase %</i>	<i>x</i>	<i>93</i>	<i>93</i>	<i>91</i>	<i>101</i>	<i>x</i>
Output of the agricultural goods (excluding subsidies) (mill.) LVL	341.1	378.0	409.4	482.8	536.1	157
<i>chain increase %</i>	<i>x</i>	<i>111</i>	<i>108</i>	<i>118</i>	<i>111</i>	<i>x</i>
Income from agricultural activities (mill.) LVL	142.0	140.9	167.0	184.6	211.6	149
<i>chain increase %</i>	<i>x</i>	<i>99</i>	<i>119</i>	<i>111</i>	<i>115</i>	<i>x</i>
Income per one employed in agriculture (per year) LVL	1264	1350	1722	2103	2394	189
<i>chain increase %</i>	<i>x</i>	<i>107</i>	<i>128</i>	<i>122</i>	<i>114</i>	<i>x</i>
Labour productivity (output of agricultural goods per 1 employed) LVL	3037	3621	4221	5499	6064	200
<i>chain increase %</i>	<i>x</i>	<i>119</i>	<i>117</i>	<i>130</i>	<i>110</i>	<i>x</i>
Total paid-out amount of the EU and State support (million) LVL	33.5	59.8	110.5	219.7	213.3	637
<i>chain increase %</i>	<i>x</i>	<i>179</i>	<i>185</i>	<i>199</i>	<i>97</i>	<i>x</i>

Source: MOA, 2005, 2006, 2007, RSS, 2007, Pilvere, 2007 and calculations done by the author

However comparing the agricultural growth indicators with those of other sectors and development rates there, as well as in Latvian economy on the whole, it is clear that agriculture still lags behind, for instance, in the field of work remuneration level etc. (MOA, 2007).

## 2. Description of Agricultural Holdings

In 2005, there were 133 004 commercially active agricultural holdings farming totally 1.7 million ha of agricultural land (AL). Thus, on average there were 22.9 ha of land per holding including 12.8 ha of the farmed AL (MOA, 2006). To obtain the number of commercial holdings in every region, the CSB data on proportion of holdings not placing products on the market in the overall number of holdings per respective district were used in accordance with the following equation:

$$\sum S_R = \sum S_K - (\sum (S_K^n \times IP^n + S_K^n \times IP^n + \dots))/100 \quad (1)$$

where  $\sum S_R$  – number of holdings per region in question manufacturing products for the market;

$\sum S_K$  – total number of holdings per region obtained by adding up numbers of holdings of all districts of the particular region;

$S_K^n$  – number of farms of the nth district;

$IP^n$  – % of nth district holdings not manufacturing products for marketing.

Thus, summarising results of the above computation in Table 2, it is evident that the number of holdings in Latvia manufacturing products for the market is 39% of the total number of holdings. There are a number of regions though, where this indicator is above the average, like Dienvidkurzeme (62%), which enjoys the highest number of holdings producing for the market in absolute figures as well as in percentage

<sup>34</sup> LVL – Latvian lats

of total farms, Viduslatvija (48%) and Zemgale (46%). The lowest proportion of holdings producing for the market is located in Lielrīga, Austrumlatgale and Ziemeļaustrumi – just 29% of the total number of holdings. Out of 100 large agricultural holdings under this study, 29 are placed in Zemgale, 16 in Dienvidkurzeme and 16 in Ziemeļkurzeme, while the smallest number of such holdings is located in Latgale region. Comparing the proportion of the 100 holdings under the study versus the overall number of holdings producing for the market, it is quite small – just 0.19 % of the number, while in Zemgale and Ziemeļkurzeme the figures are 0.48% and 0.47% respectively.

Table 2

### Quantitative profile of agricultural holdings in Latvia in 2006

No	Region	Total number of farms ( $S_K$ )	Number of farms producing for the market ( $S_R^*$ )	$S_R^*$ proportion in $S_K^*$ %	$S_R^*$ structure %	Distribution of 100 largest agricultural holdings %	100 largest farm proportion in the total number of farms %
1.	Dienvidlatgale	24825	9151	37	18	2	0.02
2.	Viduslatvija	11457	5461	48	11	4	0.07
3.	Austrumlatgale	15506	4501	29	9	6	0.13
4.	Ziemeļaustrumi	12559	3642	29	7	6	0.16
5.	Ziemeļvidzeme	12966	4348	34	8	9	0.21
6.	Lielrīga	14357	4226	29	8	12	0.28
7.	Dienvidkurzeme	17819	11088	62	21	16	0.14
8.	Ziemeļkurzeme	10321	3426	33	7	16	0.47
9.	Zemgale	13194	6092	46	12	29	0.48
10.	Total	133004	51935	39	100	100	0.19

\*  $S_R$  number of agricultural holdings of region in question producing for the market,  $S_K$  – total number of agricultural holdings per region obtained by summing up numbers of agricultural holdings of all districts of the particular region.

Source: the CSB “Survey on the structure of Agricultural Holdings in 2005”, 2006, Diežiņa S., Skreija D., 2007 and calculations done by the author

100 largest agricultural holdings “represent” all regions. The hypothesis was proposed that the existence of narrowly specialised holdings, for instance, in pig farming sector might be the underlying cause. It was established that this proposition had been partially justified, for every region (other than Ziemeļaustrumi) has such holdings, while in Austrumlatgale and Viduslatvija there are even 2 in each, Dienvidkurzeme, and Ziemeļkurzeme – 3 in each, but Zemgale and Lielrīga – 4 narrowly specialised pig production holdings in each region. At the same time, apart from highly industrialised and narrowly specialised pig production holdings, there are also traditional agricultural holdings operating in every region, which practise general agricultural production as a basic activity where it is possible to reach high turnovers.

### 3. Analysis of 100 Largest Agriculture Enterprise Indicators

#### 3.1. Sector representation

The distribution of the 100 largest agricultural holdings along the main sectors is the following (Pilvere I., 2007):

- agricultural production, i.e., mixed-type activity is the indicated core activity for 61 enterprises;
- the acquisition of plant production products is the indicated core activity for 15 enterprises;
- pig farming is the indicated core activity for 18 enterprises, while another 2 should be attributed to the first group, for, alongside with the pig farming also grain farming is indicated;
- 6 enterprises are “pure” animal production establishments.



Comparing the sector structure of the 100 above enterprises with that of average in Latvia, there is a pronounced diversion, since in Latvia, 64% of the holdings keep cattle, 29% have pigs (CSB, 2006), while out of the 100 largest holdings, 85% keep cattle, but pigs are kept in just 20% of the total holdings analysed.

### **3.2. Land areas**

The area of agricultural land farmed by the 100 largest agricultural holdings covers 1274 ha on average (Pilvere I., 2007) exceeding the average area of all farmed ALs 100 times (12.8 ha AL). 11 of the analysed holdings do not possess land (pig farming enterprises), comprising 1.2% of the number of holdings without AL in Latvia (CSB, 2006 and calculations of the author). The distribution of the 89 remaining enterprises according to the farmed ALs is the following:

- up to 199 ha: 4 enterprises or 4%;
- 200-1000 ha – 24 enterprises or 24%;
- 1001-2000 ha- 48 enterprises or 48%;
- > 2001 ha- 13 enterprises of 13% of the total number of the analysed farms.

Thus, 2/3 of enterprises having AL area farm more than 1000 ha, however only 2 enterprises in this group can be deemed as really large – the ones farming more than 4000 ha. In comparison with the average indicators for the country, 85 enterprises analysed and farming more than 200 ha AL, constitute 11% of such holdings (771) in Latvia (CSB, 2006 and calculations of the author).

### **3.3. Financial indicators of enterprises**

In 2006 the total turnover of 100 holdings was LVL 91 million or by LVL 3 million (3%) more than in 2005. This turnover translates to LVL 895 per ha of farmed agricultural land of the above 100 holdings on average (Pilvere I., 2007), thus 2.9 times exceeding the average value of the output of goods (LVL<sup>35</sup> 306 per each ha) totally in agriculture in 2006. (MOA, 2007, CSB, 2006 and the calculations done by the author). This demonstrates that farming in these 100 enterprises have probably been more intensive, as well as there is a high proportion of sub-sectors contributing additional income in the turnover. There are manifest differences between the highest and lowest turnover of these enterprises:

- in 2006 - 22 times (from LVL 263 to 5750 thousand);
- in 2005 - 174 times (from LVL 56 to 9760 thousand), demonstrating that either the situation in these holdings is rapidly changing or the critical proportion of turnover is made up by revenues from other sub-sectors (outside agriculture) (Pilvere I., 2007).

In 2006 the turnover increase trend of the 100 enterprises analysed in comparison with 2005 is positive (from 0-876%) for 77 enterprises, negative (decreased in comparison with the previous year) for 21 enterprises, and unchanged for one enterprise. Predominantly, the positive turnover increase for 40 enterprises (up to 20% per year) can be considered a marginal growth indicator if you take note of the economic development rates in Latvia on the whole. The reduction in turnover, in its turn, apart from just one enterprise having 41% which probably demonstrates some crucial changes in production and sales volumes, is negligent, mostly below 10%, probably due to seasonal fluctuations, since the year 2006 was climatically unfavourable, and farmers received additional public support in the amount of LVL 25 million to compensate for the damages of draught which is not included in the turnover (Pilvere I., 2007).

If the amounts of support and the turnover are summed up, and then the proportion of support payments in the total calculated income is figured out, then the support payments make up 11% in the 100 analysed holdings, which, on the whole, is a minimum proportion. This can be explained by the fact that 18 specialised pig farming enterprises either did not receive support or it did not exceed 2% of the total revenues. Minimum support margin proportions were received also by several enterprises of vegetable production and holdings for which a high proportion of income was sourced from non-agricultural activities. For 28 enterprises, the support amount comprises a critical part of income exceeding 20% (even up to 34%), as they are situated in the territory of less favoured areas<sup>36</sup>. The support payments for less favoured areas for

---

<sup>35</sup> Data of Economic Accounts for Agriculture (EAA) on output by agricultural sub-sectors (irrespective of production-linked subsidies) and the CSB data on the land area farmed (1.7 million ha).

<sup>36</sup> Measure "Least favoured areas and areas with environmental restrictions" of Latvian Rural Development Plan for Implementation of the Rural Development Programme for 2004 - 2006 (the Cabinet of Ministers, 2007).

these enterprises amount to 25-33% of the total support payments<sup>37</sup> (Pilvere I., 2007). According to EAA data, the proportion of subsidies in the output value of agricultural goods reached 24% in 2006, which is 2.2 times more than the average level for the 100 analysed holdings (ZM, 2007 and calculations of the author). So, the dependability of the strong enterprises, especially those operating in highly specialised areas, upon support payments is lower than that on the average in the agricultural sector.

Comparing the profit indicators of the said 100 enterprises in 2005 and 2006, the improvement is seen in 2006 when all enterprises together have acquired the total profit amounting to LVL 12.3 million exceeding the respective indicators of 2005 by LVL 1.8 million. In 2005, 8 enterprises incurred losses, while in 2006 – only two. In 2006, profit had increased for 53 enterprises, another 7 had made profit which incurred losses in 2005, 1 enterprise had managed to reduce the losses incurred and 1 enterprise, which previously was profitable, had incurred losses in 2006. In 2006, 97 enterprises had gained profit, higher or lower. According to the profit levels, enterprises can be split into the following groups (Pilvere I., 2007):

- up to LVL 50 000 – 29 enterprises;
- LVL 51 000-100 000 - 19 enterprises;
- LVL 100 001-200 000 - 30 enterprises;
- LVL 200 001-300 000 - 11 enterprises;
- above LVL 300 001 - 8 enterprises.

The profit amount per 1ha of AL farmed in the 100 analysed enterprises is LVL 97, which according to EAA data, is by LVL 24 or 20% less per ha than on average in agriculture on the whole in 2006 (MOA, 2007 and calculations of the author). Evidently, a high turnover does not necessarily ensure also high profit indicators, however note must be taken of the fact that over the recent years the large enterprises have invested high financial assets in upgrading of the fixed assets and facilities resulting in increased depreciation deductions, which reduced the overall profits. Therefore evaluating the profit amounts, one should analyse investment in great detail, otherwise the profit amount alone does not characterise the profit stability of the enterprise.

Comparing the profit with the support received, out of 86 enterprises having gained profit and received also support payments in 2006 (11 pig farming enterprises have not received support), the profit exceeds the support payments received in 39 enterprises or 45% of enterprises, furthermore, in 11 enterprises it exceeds them more than twice, but in 47 enterprises or 55% of the total number – the profit is lower than the support payments received. So, for the establishments with high turnover the support payments constitute a significant source of funding they could not do without and continue their activities for a long time due to incurred losses while the EU CAP support is a certain cushion against continuously rising costs enabling them to stay profitable and grow (Pilvere I., 2007). Comparing the indicators of the 100 analysed enterprises against the total indicator of agriculture, according to EAA, the support amount in 2006 constitutes 79% of the total income per sector (MOA, 2007 and calculations by the author), which is by 12% less than the average indicator per 100 enterprises (91%).

In 2006 comparing the turnover profitability (profit versus turnover) in all the analysed enterprises, the profit is 13.5% on average showing a slight increase (1.5%) in comparison with 2005. In 2006, the profitability level in 97 profitable establishments is distributed as follows:

- minimum or up to 4.9 % - in 25 enterprises;
- 5- 9.9% - 9 enterprises;
- 10-19.9% - 34 enterprises;
- 20-29.9% - 9 enterprises;
- 30-39.9% -9 enterprises;
- over 40% - 11 enterprises.

Thus, the enterprises may be quite evenly broken down in 3 large groups having low, medium and high turnover profitability. In a similar way, completing calculations on the output profitability of the agricultural sector on the whole, according to EAA indicators (39%) (MOA, 2007 and the calculations of the author), the average indicator of the profit level of 100 holdings is exceeded 2.9 times.

---

<sup>37</sup> Analysing support payments for 100 holdings, only the EU direct payments (Single Area Payment and supplementary local public direct payments) as well as several area-related payments of the Rural Development Plan have been taken account of, however the amount of the state support and Structural Funds' support has not been regarded.

## Conclusions

1. In Latvia, over the last 5 years, yet especially subsequent to the accession, positive development trends are observed in all the main agricultural indicators. This is expressly demonstrated by increase of the labour efficiency (2 times higher in comparison with that of 2002) as well as revenue increase per the employed: 1.9 times increase influenced by the reduction of number of employees, and increase of the production amounts and prices of products.
2. The amount of the disbursed support over the reference period has increased 6.4 times and this rise assuringly exceeds the increase rates of other agricultural indicators demonstrating that part of the support is evidently channelled to cover the growing costs.
3. Altogether there are 133 004 agricultural holdings in Latvia out of which just 39% produce for the market. The highest number of commercial farms (11 088) is located in Dienvidkurzeme, a high proportion being located also in Viduslatvija and Zemgale regions. A minimum number and proportion of commercial farms are placed in the regions of Lielrīga, Austrumlatgale and Ziemeļaustrumi – barely 29% of the total number of holdings in these regions.
4. The detailed analysis of indicators of the 100 largest (by turnover in 2006) agricultural enterprises show that:
  - the majority of such enterprises is located in Zemgale – 29, Dienvidkurzeme and Ziemeļkurzeme – 16 each, and the least number is in the region of Latgale;
  - 61% of the total number are mixed-type holdings and among the 100 analysed holdings, the proportion of animal production holdings is higher than the average per country;
  - the average land area managed by these holdings exceeds the average AL area of holdings in Latvia 100 times, however 11% of the analysed holdings have no land - the ones specialising in pig farming;
  - the turnover of the enterprises over two last years have been increasing, and exceeds the average level in Latvia 2.9 times as per ha of farmed land;
  - the support payments account only for 11% of the total turnover of the holdings, since 18% of holdings have either not received any support payments at all or these payments have been marginal (operators of pig-farming and vegetable growing sub-sectors);
  - 97% of the enterprises in 2006 have gained higher profit than in 2005; however the profit margin per ha farmed is by LVL 24 lower than in agriculture on average;
  - 92% of the profit of the enterprises in question is provided by support payments, exceeding the respective average level in agriculture by 12%;
  - the turnover profitability is 2.9 times lower than in agriculture on average;
  - consequently it can be concluded that a high turnover does not necessarily ensure high profit margins and profitability indicators.

## References

1. Atkočiūniene V., Petrauskienė R., Tijūnaitienė R. (2007). Analysis of LAG's Performance in Lithuania // Proceedings of the International Scientific Conference "Economic Science for Rural Development", Primary and Secondary Production, Consumption, No 12, Jelgava, 2007, p 105.
2. Central Statistical Bureau (2006). 2005.gada lauku saimniecību struktūras apsekojums [Survey of the Structure of Agricultural Holdings in 2005], Riga, sections 1-6., 1-11. and 1-12.
3. Dieziņa S., Skrejīša D. (2007). Lielākie lauksaimniecības produkcijas ražotāji Latvijā [Largest Agricultural Producers in Latvia] // Newspaper *Dienas Bizness*, Riga, 13 November 2007, p. 4-5.
4. Hilgers Y., Nolten R. (2007). Agricultural Participation in Rural Networks. A Case Study on the Implementation of Intereg III // Proceedings of the International Scientific Conference "Economic Science for Rural Development", Primary and Secondary Production, Consumption, No 12, Jelgava, 2007, pp 83-84.
5. Rural Support Service (2007). Lauku atbalsta dienesta 2006.gada publiskais pārskats [2006 Public Survey of Rural Support Service], Riga, 20 pages,  
[http://www.lad.gov.lv/images/data/lad\\_publ\\_gada\\_parskats\\_2006.pdf](http://www.lad.gov.lv/images/data/lad_publ_gada_parskats_2006.pdf), viewed 28.12.2007.

6. Rural Support Service (2007). Lauku atbalsta dienesta darba rezultāti 2007. gadā [Performance Results of Rural Support Service in 2007], Riga, <http://www.lad.gov.lv/index.php?d=1124>, viewed 28.12.2007.
7. Mejszelis M., Mickiewicz P. (2007). The Neighbour Land Trading Market in the Prospect of Structural Changes in Agriculture // Proceedings of the International Scientific Conference “Economic Science for Rural Development”, Primary and Secondary Production, Consumption, No 12, Jelgava, 2007, p 78.
8. Cabinet of ministers (2007). Ministru kabineta noteikumi nr.184 grozījums ministru kabineta 2004.gada 30.novembra noteikumos nr.1002 „kārtība, kādā ieviešams programmdokuments „latvijas lauku attīstības plāns lauku attīstības programmas īstenošanai 2004. – 2006.gadam””, [cabinet regulations no. 184 amending the cabinet regulations no. 1002 of 30 november 2004 ”implementation procedure of the framework document “latvian rural development plan for implementation of the rural development programme of 2004 – 2006”], riga, 20 march 2007 (minutes no.19 6.§).
9. Nurmet M., Lemsalu K. (2007). Financial Aspect of the Firm’s Sustainability in Estonian Agriculture // Proceedings of the International Scientific Conference “Economic Science for Rural Development”, Primary and Secondary Production, Consumption, No 13, Jelgava, 2007, p 26.
10. Piecuch J. (2007). Development of Agriculture in Portuguese Regions // Proceedings of the International Scientific Conference “Economic Science for Rural Development”, Primary and Secondary Production, Consumption, No 12, Jelgava, 2007, p 99.
11. Pilvere I. (2007). Lauku uzņēmēju TOP-100-visi Latvijas reģioni [TOP-100 Rural Entrepreneurs: all Regions of Latvia]//Newspaper *Dienas Bizness*, 13 November 2007, Riga, p. 2-3.
12. Pilvere I. (2007). Protectionism – One of the Factors in Agricultural Development// Humanities and Social Sciences Latvia, Dynamic Development of Production Factors 1(50)2007, University of Latvia, Riga, pp 43-56.
13. Vēveris A., Leimane L., Krieviņa A. (2007). Efficiency Analysis of Agricultural Sector in Latvia Compared to Other EU Countries, Based on FADN Data// Proceedings of the International Scientific Conference “Economic Science for Rural Development”, Primary and Secondary Production, Consumption, No 13, Jelgava, 2007, p 13.
14. Ministry of Agriculture (2005). Agriculture and Rural Areas of Latvia 2005, Riga, 142 pages
15. Ministry of Agriculture (2006). Agriculture and Rural Areas of Latvia 2006, Riga, 142 pages
16. Ministry of Agriculture (2007). Agriculture and Rural Areas of Latvia 2007, Riga, 152 pages

### Kopsavilkums

Pēc Latvijas iestāšanās Eiropas Savienībā, lauksaimniecības nozarē vērojamas pozitīvas pārmaiņas ne tikai Latvijā, bet arī citās ES dalībvalstīs. Šajā rakstā autore analizē galvenos lauksaimniecību raksturojošos rādītājus Latvijā pēdējos piecos gados. 2004.un 2005.gadā būtiski ir palielinājies lauksaimniecības nozarei paredzētais valsts un ES atbalsta apjoms, kas ir veicinājis pozitīvas attīstības tendences lauksaimniecību raksturojošajos rādītājos. Ir palielinājies ienākuma līmenis uz katru lauksaimniecībā nodarbināto un cēlies darba ražīgums. Rakstā ir analizēta lauku saimniecību struktūra Latvijā, konstatējot, ka 61 % no kopējā saimniecību skaita neražo produkciju pārdošanai. Visvairāk šādu lauku saimniecību ir Lielrīgas, Austrumlatgales un Ziemeļaustrumu reģionos. Savukārt, vislielākais saimniecību skaits, kas ražo produkciju pārdošanai atrodas Dienvidkurzemes reģionā – vairāk kā 11000, daudz šādu uzņēmumu ir arī Viduslatvijas un Zemgales reģionos.

Rakstā ir analizēti Latvijas 100 lielāko, pēc apgrozījuma 2006.gadā, lauksaimniecības uzņēmumu raksturojošie rādītāji: to izvietojums Latvijas reģionos, apsaimniekotā zemes platība, saņemtie atbalsta maksājumi, peļņas, apgrozījuma izmaiņas un rentabilitāte 2006.gadā salīdzinājumā ar 2005.gadu. Cik iespējams, ir salīdzināti 100 lielāko uzņēmumu dati ar vidējo līmeni Latvijā, izmantojot Centrālās Statistikas pārvaldes un Lauksaimniecības ekonomiskā aprēķina rādītājus.

## Application of Logistics Methods and Instruments in the Forestry Products Circulation

Agnese Radžele-Šulce, Mg.oec., PhD student, Department of Business and Management, Faculty of Economics, Latvia University of Agriculture

Kazimirs Špoģis, Dr.habil.agr., professor, Department of Business and Management, Faculty of Economics, Latvia University of Agriculture

### Abstract

The research results included in the paper are grounded on the basics of logistics theory and the data of functioning transportation service enterprises.

The aim of the research is to investigate the performance and development of logistics systems in enterprises transporting round timber and processing forestry residue, and to evaluate the economy of technological modernisation for enterprise systems.

Deductive and inductive research methods, as well as other qualitative analysis, economic analysis and synthesis research methods were applied in the study.

Main conclusions resulting from the research show that informative and technological modernisation of logistics systems, using GPS makes a real possibility for economy of basic activity costs and saving of personnel labour, but logistics systems and operation methods develop and modernise more successfully and dynamically in new enterprises with a higher proportion of young employees in the personnel age structure.

**Key words:** logistics, transport, GPS

### Introduction

Recently methods, instruments and integrated systems of logistics are being introduced in the Latvian national economy, especially in industries and enterprise groups of transit business. Large capacity and powerful inter-industrial logistics centres, which take part in global processes, rapidly emerge.

The principles, methods and instruments of logistics science develop also in primary industries like agriculture and forestry. Several local logistics centres have also emerged in primary industries. There are already scientific researches and publications done on such processes (Radžele A., 2007; Radžele A., Špoģis K., 2007; Logistics in ..., 2006.)

There are quite few published research results in Latvia on modern logistics systems or their element performance in forestry product circulation. The following economic researches are especially topical regarding logistics: collection, sorting, packing, storing, supplying, processing and transportation of forestry residue, and shipment of forestry products.

After considering the topicality of our research, **the following hypothesis** is formulated: the modernisation of logistics systems in the industry of round timber transportation, and their application in the industry of processing and circulation of forestry residue can contribute to economically rational value added.

To verify such a hypothesis, three **tasks** were set:

- 1) to investigate a service of round timber transportation in the logistics systems of two enterprises;
- 2) to analyse logistics systems or application experience of their methods and instruments in the circulation of forestry residue;
- 3) to evaluate an economic content for the technological modernisation of logistics systems.

**The aim** of the research follows from the set tasks: to investigate the performance and development of logistics systems in enterprises transporting round timber and processing forestry residue, and to evaluate the economy of technological modernisation for enterprise systems.

The data on two operating enterprises and production information were used to solve the tasks. Due to some logical motives, these enterprises were studied as objects "X" Ltd and "Y" Ltd.

Deductive and inductive research methods as well as other qualitative analysis, economic analysis and synthesis research methods were applied in the study.

## Results and Discussions

### 1. *Modernisation of logistics systems' information technology in "X" Ltd and "Y" Ltd*

Two enterprises that operate in the timber industry and manage round timber supplies themselves for their production units, as well as sell round timber transportation services for other enterprises were chosen to solve the research tasks. Transportation of forestry residue and its processing products is a second operational direction of the enterprises.

"Y" Ltd is a growing Latvian enterprise with five years experience in the market, but it has several essential advantages due to the enterprise technological modernisation strategy: the enterprise is applying a single computer software program for processing transportation information. The Global Positioning System (GPS) was introduced in the enterprise, which is a device for determining coordinates, a course and a speed – with this device a signal from a satellite is delivered to a map controlling the process.

Some recent GPS devices are "so smart" that when determining coordinates, they take into consideration also the time factor that is necessary for simultaneous signal transmission from 12 satellites to a receiver, enabling the receiver to determine its location with maximum precision. When coordinates are determined, a GPS device calculates the rest of information – the speed, distance, time of sunrise and sunset, an approximate time for reaching a destination, fuel consumption etc.

Companies use this system for their lorry drivers to determinate the shortest, quickest and most precise way to reach their destination and for dispatchers to monitor those drivers – to see where a lorry driver is and at what stage is the order fulfilment. This information lets dispatchers to plan when they can give the next order. This system also allows them to estimate fuel consumption and a quantity left in a lorry's fuel tank, which gives one 100% security from fuel theft.

The company has introduced the system of Microsoft Business Solutions-Axapta, which is the most complete solution for planning enterprise resources (ERP) acceptable for medium-size enterprises.

It helps expand entrepreneurship and immediately widen business activities with Internet assistance. The software Axapta ensures successful cooperation with customers, partners, employees and suppliers.

Axapta provides all the functions necessary for business, including production, wholesales, supply chain management, project management, financial management, customer relations management, personnel management and business analysis.

It meets Latvian legislation and accounting requirements, and operates in many languages and currencies. Axapta presents a number of modules, which are compiled in Figure 1.

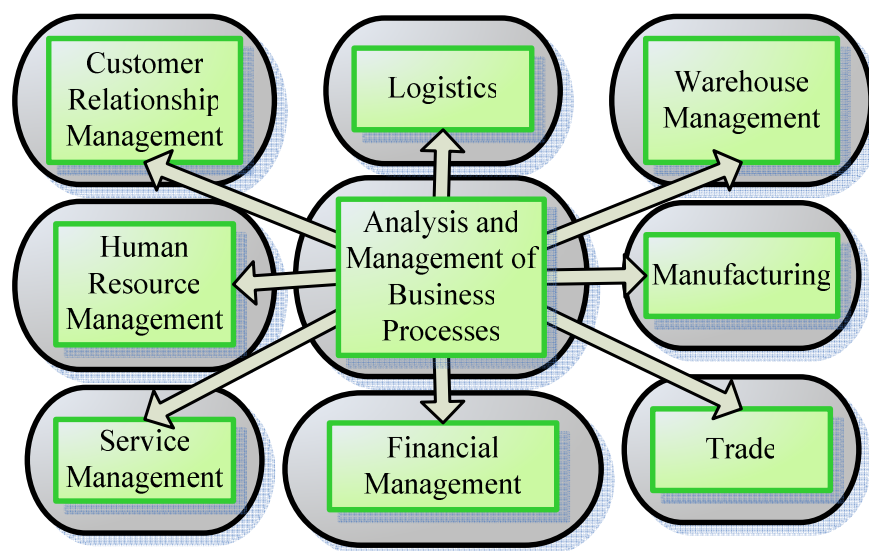
Axapta is a completely integrated EPR solution, which uses one business logic, one primary code and one database, and one set of instruments. It is fully equipped for working in the Internet and supports the leading systems for database management, including a Microsoft SQL server and Oracle databases. Owing to the adjustable primary code, any solution might be modified according to the company needs whenever it is required.

This software in the company is connected to the GPS system from which it automatically gets route distances, and a scheduled time for reaching a destination. After that the computed data are compared to the real data.

"Y" Ltd has many young specialists; the average age of employees is 27 years. Therefore, the company employees are able to cope with the newest technologies and use them.

The second company engaged in the research - "X" Ltd is a large wood processing enterprise with 50 years experience in the market. Unfortunately, decision-making is complex and time consuming in this company. Each employee of the company has a narrow area of responsibility and it is hard to find any relationships in the company performance.

This company has also introduced the system of Microsoft Business Solutions-Axapta, but its Trade and Logistics as well as Warehouse Management modules are not used.



**Fig. 1. Modules presented by Microsoft Business Solutions-Axapta**

The ageing of employees is a significant problem at “X” Ltd, since a great part of employees, especially those having leading positions, are over the age of 40, and they are not able or do not want to keep up with the newest information technologies and are reluctant to introducing and using them.

## ***2. Possibilities for optimising round timber transportation***

The same companies – “X” Ltd and “Y” Ltd were chosen for studying the possibilities for optimising round timber transportation; the efficiency of round timber transportation was analysed as well. The system of information circulation and technologies first and mostly affects the optimisation possibilities. The information circulation regarding round timber transportation in both companies is shown in Figure 3. Source: the data of “X” Ltd and “Y” Ltd and authors’ estimates

If assessing Figure 2 visually, it seems that the flow of information in “X” Ltd is much shorter and simpler; nevertheless, after a more detailed analysis of both systems, entirely another impression emerges.

The initial process is equal in both companies – the dispatcher takes a transportation order and compiles this information. The dispatchers of both companies do it in a simple way – just enter the data (time, route, assortment, contact person) in the MS Excel software. At this phase the first difference emerges – the dispatcher of “X” Ltd, according to the schedule, approximately identifies a driver who might be free of duty and phones him. If dispatcher’s prediction is correct and the driver works with no delays, the dispatcher delivers a new transportation order with all the information on the customer. If the driver has not finished his previous order, the dispatcher looks for another driver.

However, the dispatcher of “Y” Ltd uses GPS for finding a driver. The dispatcher sees a location of each driver and a stage of order fulfilment, and finds a first driver who is located closer to the new route by assessing a time period needed to finish the previous order and phones the driver to deliver the information on the new order.

After that the driver of “X” Ltd moves to the place of loading, fulfils the new order, fills in the route sheet which includes the information on kilometrage with load and deadhead kilometrage, time of loading and unloading and a waybill number. The driver fills in also the invoice – a report on kilometrage and fuel consumption. The driver leaves these documents at the office, and the dispatcher gets them during a period of three days.



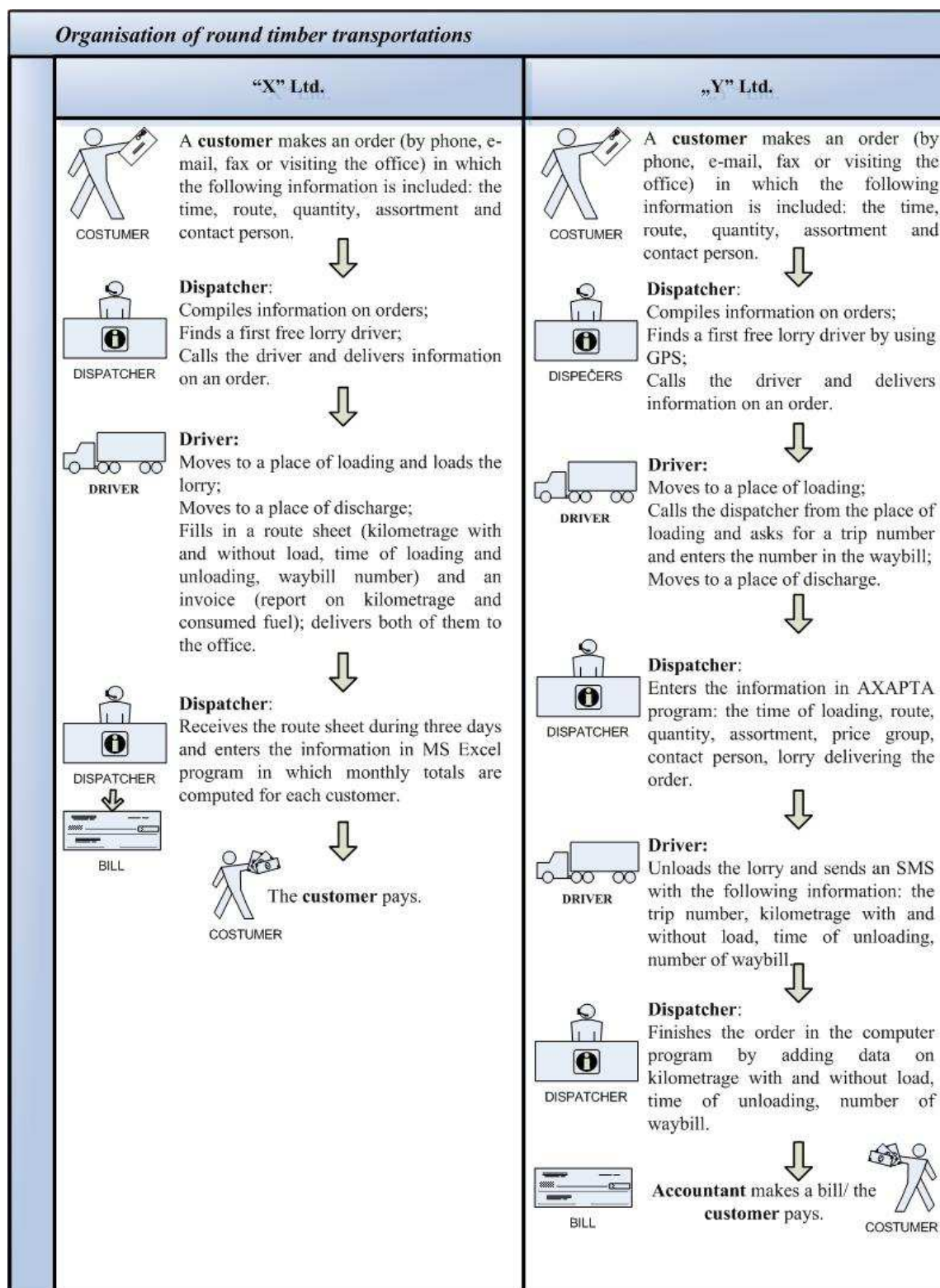


Figure 2. Circulation of information on round timber transportation in "Y" Ltd and "X" Ltd



This process is different in “Y” Ltd. After a phone call is received, the driver moves to a place of loading from where he calls the dispatcher and asks for a trip number. Any trip is assigned a number in ascending sequence and trips are renumbered each year, starting with No. 1. The trip number allows the company to record all deliveries in a chronological order, thus, distinguishing them from each other and controlling them in an easy way. The driver records this trip number in the waybill in a field for notes. During this phone call, the driver gets precise information from the dispatcher on the time of loading and the place of unloading because usually some changes occur at the place of loading or information that is just more precise is delivered. After this phone call, the dispatcher enters all the available information on the order in the Axapta software. This information is not entered sooner because frequently information on the place of unloading changes a little. Initially, the following information is entered into the Axapta software: the lorry fulfilling an order, the time of loading, the route, quantity, assortment, price group (for example, whether logging is carried out by the company in the territory of Latvia or it is carried out by the company outside the territory of Latvia, a sawmill pays for services, round timber bought from roadsides, internal transportation among company’s areas, another cargo etc.), a customer’s contact person. When the data are entered into the computer software, the dispatcher sends an automatic SMS from the computer software to the driver with additional information (the SMS is a kind of empty form or route sheet that have to be filled in by the driver: trip number..., deadhead km..., km with load..., time of unloading..., waybill number...) in order to close the order in the computer software. The driver usually receives this SMS when moving from a place of loading to that of unloading but fills in the SMS at the place of unloading.

When the driver has sent the SMS back to the dispatcher, he or she fills in the lacking information, and as soon as all the information on an order is entered into the computer software, it automatically is delivered to an accountant who makes calculations using the same computer software.

A bill is sent to the customer who pays it. As one can see, the bill is made on the same day a service is produced in this system, therefore, payments, in accordance with the contract provisions, are received soon.

Here is the largest difference, if compared to “X” Ltd – the dispatcher of this company receives route sheets and enters their data in the same sequence into the MS Excel software, however, the sequence of receiving route sheets not always corresponds to real order fulfilment terms. As lorry trips are not numbered, it is hard to make a list of orders in a chronological sequence. The information entered into the Excel software is identical to the information entered in the Axapta software by the dispatcher of “Y” Ltd. After that the dispatcher of “X” Ltd calculates totals for every customer at the end of each month. If the dispatcher is sure that no more orders are expected from a customer who has made a single order, a bill is prepared quite soon for this customer. One can conclude that the dispatcher of “X” Ltd is swamped with surplus work, especially at the end of month, when the dispatcher is supposed to compile all information on orders for every customer. Unlike the situation in “Y” Ltd where bills are prepared by an accountant automatically using the computer software, the dispatcher of “X” Ltd does it manually.

Besides, there is one more difference between the two companies – “X” Ltd employs only one dispatcher. If the dispatchers of this company liked to work in shifts, the process of shift change would be very complicated – the information on current locations of lorry drivers, which are the new orders, which orders have been delivered to lorry drivers and which not yet, will have to be transferred to a next shift’s dispatcher because, in this system, the dispatcher keeps in his or her head all the information that is displayed by a GPS device in “Y” Ltd. Besides, if information on orders delivered to lorry drivers by one dispatcher were entered into a computer by another dispatcher, there would be a problem with control.

However, if the dispatchers share their duties in this system – one of them controls lorry drivers, the other one enters data into a computer – the efficiency of control would decrease. It is hard to do this job for one dispatcher because, one can say, the dispatcher works all day and night long – during the day the dispatcher controls lorry drivers along with entering data into a computer. After the dispatcher leaves the office and during weekends the work continues because such large companies function all day and night long. The dispatcher becomes irreplaceable as it is difficult for the company to place the dispatcher on leave and if the dispatcher suddenly gets sick, the system might be blocked. These risks are very significant for such a system.

In “Y” Ltd, the dispatcher’s duties are performed by 3 employees according to a rolling schedule. During a busy season, the employees are in the office all day and night long while during a non-season period, the office business hours are from 7 a.m. to 9 p.m., but the dispatcher takes the mobile business phone home and keeps assigning trip numbers for lorry drivers. At the end of a shift, the employee is free –

all the duties are handed over to his or her colleague – and the shift change includes handing over the business mobile phone because:

- the GPS system displays locations of all lorry drivers and a stage of order fulfilment;
- fulfilling a new order does not affect previous orders;
- after a call is received from a driver informing on loading his lorry, trip numbers are assigned in a chronological sequence – the computer software displays the last order number and the next number can be assigned to the driver;
- after a driver's SMS is received from a place of unloading, according to a trip number, the information is entered into the computer software and sent to an accountant.

One can conclude from this research that the application of modern computer software for company management, including logistics and transportation management, provides the company with several advantages:

- cash flow is faster – bills are made almost simultaneously with load delivery;
- by using GPS, a dispatcher is able to monitor all lorry drivers 24 hours a day, and to see their location and at what stage an order is fulfilled, to respond to customer questions in an efficient and fast way if any question arises, thus, raising the level of service in the company;
- when making a schedule for drivers with GPS, the dispatcher is able to arrange back loads more efficiently;
- when using the company's management system with a logistics and transportation module, information on lorry trips is foreseeable;
- when using the company's management system with a logistics and transportation module, the dispatcher and the accountant, too, are released from preparing bills manually – double entry of data as bills are produced automatically by the computer software from entered data;
- lorry drivers do not have to fill in route sheets, thus, a risk that these sheets might be lost or forgotten to be submitted is reduced;
- dispatcher's work can be arranged in shifts in such companies, thus, providing higher labour efficiency. The fact that this is a round-the-clock job, especially during a busy season is taken into account;
- no irreplaceable employee exist in the logistics service.

### ***3. Optimisation of loading in transportation of forestry residue and its processed products***

The data of "X" Ltd were used in the research. As "X" Ltd is engaged not only in transporting round timber, but also in processing wood, there is a production residue like woodchips that are sold to several EU countries as firewood.

According to the company's plan, in 2008 "X" Ltd is going to produce approximately 40000 m<sup>3</sup> of firewood chips. In 2007, the transportation of firewood cost the company on average LVL 7500 a month.

Until the end of 2008, 5 container lorries and 43 containers are at disposal of the logistics service of "X" Ltd.

A theoretical advantage of container lorries, if compared to firewood lorries and dumpers, is their ability to leave a dump box or container for loading and to transport it when it is fully loaded. It significantly reduces an idle time for lorries!

#### **Real situation**

According to a trip time test, presently the transportation of firewood by lorry to a seaport from where it is exported to other EU countries on average takes:

- |                   |           |
|-------------------|-----------|
| – firewood lorry  | 3.7 hours |
| – container lorry | 3.3 hours |

#### **Optimal situation**

A container lorry picks up a fully loaded container, leaves an empty one instead, and transports firewood to a seaport – it takes maximum **2 hours**.

**Table 1**  
**Comparison of the present and optimal costs for transporting firewood to a seaport in “X” Ltd**

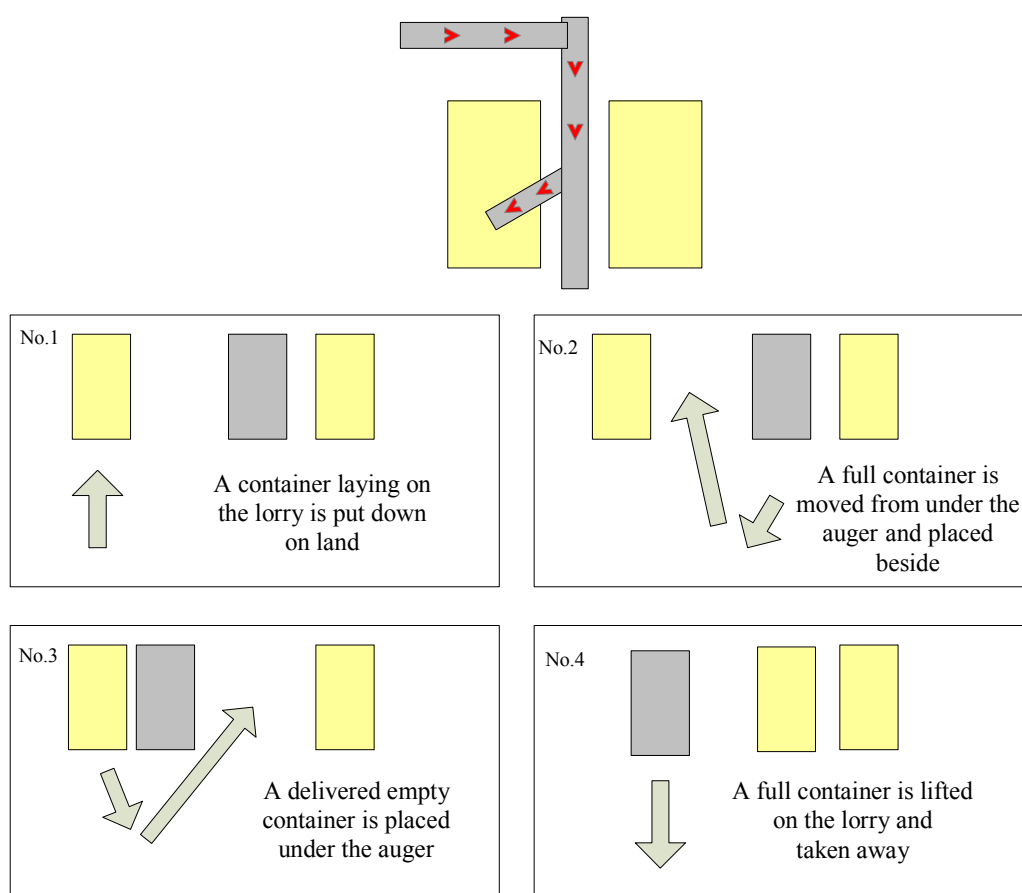
Indicators	Monthly, LVL	Annually, LVL
Present cost, assuming that an average trip time is 3.5 h	7521	90251
Optimal cost, assuming that an optimal trip time is 2.0 h	5030	60355
<b>Difference</b>	<b>2491</b>	<b>29896</b>
<b>Cost saving, %</b>	<b>33 %</b>	<b>33 %</b>

Source: the data of “X” Ltd. data and authors’ estimates

#### Optimisation possibilities

In order to reduce a trip time in firewood transportation, the firewood loading has to be optimised. It can be achieved if a self-propelled auger with a chip distribution mechanism for 2 or 3 containers is installed.

The cost for building such equipment is LVL 30000-40000 (installation excluded).

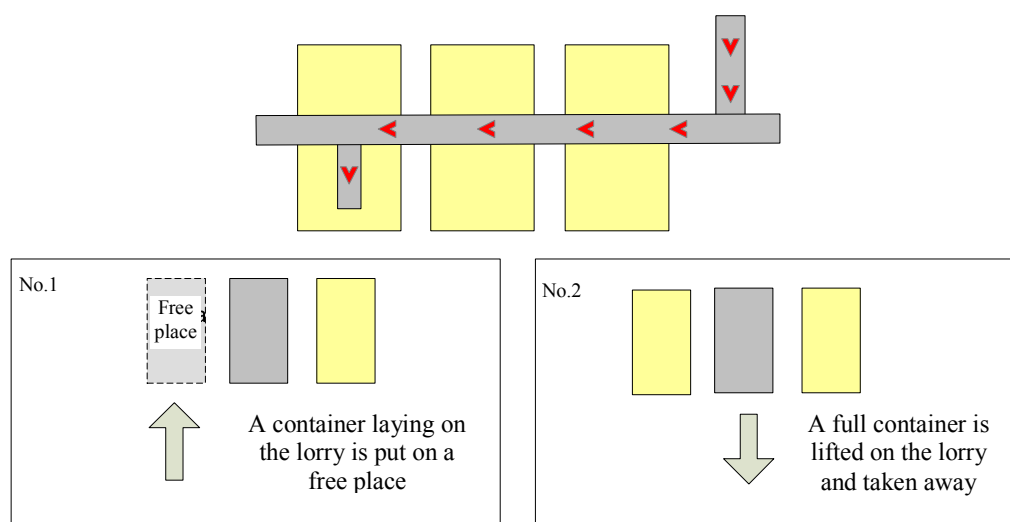


Source: authors’ scheme according to the data of “X” Ltd

**Figure 3. Working process for a 2-container self-propelled auger**

Operational principles for a 2-container self-propelled auger (Figure 3):

- the auger is able to load 2 containers;
- the system automatically determines the quantity loaded in the container and spreads it evenly;
- when the first container is fully loaded, the auger moves to the second container.



The most optimal way of operation for the self-propelled auger: the auger is able to load 3 containers while other operational principles remain as in case of 2 containers (Figure 4)

Source: authors' scheme according to the data of "X" Ltd

**Figure 4. Working process for a 3-container self-propelled auger**

The comparison of the self-propelled augers:

- if a 3-container auger is operated, container hooks and rolls and auto manipulator wear twice as slow, thus, increasing their lifetime;
- asphalt or concrete surfacing is not damaged in the loading area as containers are placed in the area restricted for this purpose only. No additional costs for repairing the surfacing;
- by reducing container replacement time from 4 to 2 as in case of 3-container auger, a gain of time is 5 min;
- annually 3000 lorry trips are completed, the gain of time by using a 3-container auger, in terms of money, totals LVL 2500.

Gains in "X" Ltd:

- financial savings – the equipment pays back in a 1.5 year period  
Equipment costs:
  - 2-container auger costs around LVL 30000 + installation,
  - 3-container auger costs around LVL 40000 + installation;
 Annual transportation cost savings are LVL 29896;
- firewood loading is fully automated;
- an appropriate container lorry is used;
- additional capacity is gained by optimising present transportations;
- an opportunity to liquidate the old firewood lorries;
- if the system is arranged in this way, there is no need for 2 drivers to do the same quantity of work.

It is possible to additionally optimise the system by sending a message (transportation order) in the system (to a driver etc.) indicating that a *container is full*. The message is sent at a moment when a container is full and the auger moves to other container.

Theoretically, enclosed documents can be also printed automatically when a message is received – it reduces an amount of work that has to be done by supervisors of the production unit.

## Main conclusions

1. The introduction and use of logistics systems and methods in transportation companies reduces costs at different stages, and increases the quality of services and company's competitiveness.
2. The development of an efficient logistics system in round timber transportation enterprises is based on introducing a united computerised system, which includes a logistics module on the enterprise level.
3. The use of containers in transporting wood processing residue can reduce the transportation costs as well as the number of employees.
4. By tackling the research tasks, the research aim is reached and the hypothesis is proved: the informative and technological modernisation of a logistics system creates possibilities for cost reduction and personnel labour saving.
5. Logistics systems and methods most successfully are used and most dynamically modernised in new enterprises having a higher proportion of young employees in the personnel age structure.

## References

1. *Logistics in Nordic Wood Supply*. Materials of courses in Swedish University of Agricultural Sciences. 2006.
2. Radžele, A. *Application of Logistics Methods and Instruments in Primary and Secondary Production Spheres in Latvia*. Humanities and Social Sciences Latvia Social Sciences, Riga: LU, 2007., 70.-89. pp.
3. Radžele, A., Špoģis, K. *Loģistikas sistēmas kā risku vadīšanas vide, metode un instruments lauksaimniecības uzņēmumos. 9. nodaļa monogrāfijā Lauksaimniecības un pārtikas risku vadīšana (Logistics Systems as a Environment, Method and Instrument for Risks Management in Agricultural Enterprises. Chapter 9 from Monograph Risks Management of Agriculture and Food)*, Jelgava, 2007., 439.-468. pp. (in Latvian)
4. "X" Ltd unpublished information and results of economic action indicators (in Latvian)
5. "Y" Ltd unpublished information and results of economic action indicators (in Latvian)

## Attractiveness of Living Space and Regional Higher Education Institutions

**Baiba Rivža, Maiga Krūzmētra, Dace Vīksne**

Latvia University of Agriculture

E-mail: baiba.rivza@llu.lv

### Abstract

The second half of the 20<sup>th</sup> century has emerged with a new approach to the notion of space, not so much denoting a geographic place as three dimensional formations comprising the surface, all formations on the surface and all the activities taking place on this surface. The human life occurs in this particular three-dimensional space; therefore we can speak about the living space, its role in the life of an individual, various social groups, and the whole society. The present research focuses on the regional space including higher education institutions for the purpose of the exploration of the role of its presence in the space development and the improvement of its attractiveness. Regional higher education institutions rely on the National Development Plan that highlights the development of education, creative individuals, science and research, and polycentric approach towards it. Significant European Structural funds will reach regional universities and educational system with the purpose of the modernisation of the study infrastructure and programme content. The research findings show that the development of regional higher education institutions has influenced the growth of GDP of the towns under the question and their active businesspeople. It is significant to raise awareness of the role of corporate social responsibility in the attractiveness of the living space.

**Key words:** living space, attractiveness, regional, higher education institution, corporate social responsibility

### Introduction

The second half of the 20<sup>th</sup> century has emerged with a new approach to the notion of space, not so much denoting a geographic place as three-dimensional formation comprising the surface itself, all formations on this surface and all the activities taking place on the surface. The human life occurs in this particular three-dimensional space; therefore we can speak about the living space, its role in the life of an individual, various social groups, and the whole society.

The more the space is provided with various resources and the more successful is the utilization of resources, the more attractive the space becomes for an individual, various social groups, and the whole community.

The space as an important category for the analysis has been examined by the researchers of human geography Edward Soja and David Harvey. Soja (2003) has published the article in which the idea is expressed in its title "town should be described in terms of the space". He introduced the notion of triad: space – social aspects – history. Harvey (2001) focused on two aspects: first, the unity of geographic space and political power, and second, the space in relation to political system is produced, i.e., formed and developed.

The space is analysed by sociologists. The sociologist Georg Simmel already at the beginning of the 20<sup>th</sup> century in two articles "The Sociology of Space" and "On the Spatial Projections of Social Forms" proposed the opinions connected with space: firstly, space is socially important, secondly, space conditions influence social interaction, and thirdly, space conditions influence the types of physical, social, and psychological distance. Simmel (1997) described five features of space: space is solid or scattered, it is divided not only by natural, but also by social borders, social interaction establishes social formations, and social interaction draws people together, simultaneously grouping people according to different parameters. However, the space theory by Lefebvre (2007) seems the most appropriate to the present situation. Lefebvre (2007) posits that space is a social product or complex social structure that is created depending on the interests of certain community since each community creates its own space. Each space is subjected to the analysis in terms of its shape, structure and functions, which are not isolated, because shape, structure and functions are closely connected. For example, inhabitants might be concentrated or scattered in the space; a

modern American town differs from a Spanish colonial town. The structure, in its turn, reflects the relationship between the whole and the details, between micro and macro level, between the private and the public; consequently it explores the relationship. Thus the shape and structure determine and simultaneously reflect the functions possible in the space (Lefebvre: 2007).

In the present post-modern society that is characterized by deconcentration, decentralization and dispersion, more rapid development occurs in the suburbs, the territories of former towns and around universities with campus territories (Herwin: 2001).

The living space is structured in different ways. One of the variants is regional division of space. In Latvia space could be structured in the following way: national space, regional space, and local space.

The present study focuses on the regional space including higher education institutions in order to evaluate the influence of their presence on the space development promotion and the growth of attractiveness.

## Results and Discussions

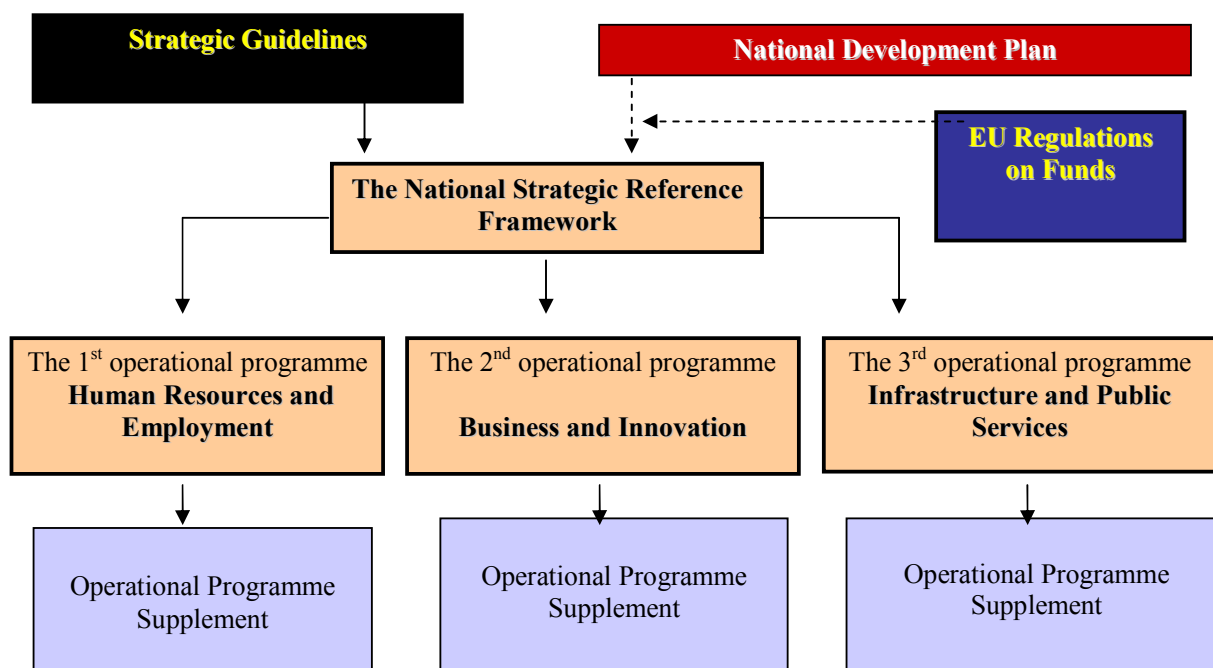
Legal financial and administrative tools are demanded for the development of the regional space. An important legal tool is the Cabinet Regulations No. 198 "Regional Policy Guidelines" of April 2, 2004 ([www.raplm.gov.lv](http://www.raplm.gov.lv)). The policy planning document determines the national regional policy for the coming 10 years defining the main principles, goals, priorities and activities of the national regional policy. It is important to mention the goals set in the document, which shall be achieved attracting government funding, budget funding and the EU structural funding. The Guidelines include the following long-term goals:

- 1) approximation of the level of development of Latvia and its regions to the level of the countries of Europe;
- 2) increase of the international competitiveness of Latvia and its regions;
- 3) equivalent life, work and environmental conditions for inhabitants across Latvia for contribution of equivalent development of territories, regions and their separate parts;
- 4) equivalent entrepreneurship conditions across Latvia for contribution of equivalent development of territories, regions and their separate parts.

The approval of the National Development Plan (NDP) for 2007-2013 by the Cabinet of Ministers on July 4, 2006 is an important turn in the politics and economy of Latvia ([www.nap.lv](http://www.nap.lv)). The strategic goal of the NDP is education and knowledge for the economic growth and technological competence. Three priorities are set to achieve the goal (Figure 1):

- *educated and creative individual*, where the main focus is laid on infrastructure modernization and structuring in the education system of all levels including regional universities, ensuring the relevance of highly qualified labour force to the labour market demands and stating the importance of establishment and implementation of long-life learning system in the space development;
- *sophisticated technologies and flexibility of enterprises*, focusing on various types of training processes in entrepreneurship issues; regional universities are of great importance here;
- *development of science and research*, including renovation/development of research potential, the promotion of excellence in regions, as well as partnership between the research done at universities and entrepreneurship, developing innovative business activities and research infrastructure.

The successful implementation of all the above mentioned priorities and the achievement of the strategic goal are closely connected with the development of the regional space and the growth of its attractiveness.



Source: [www.nap.lv](http://www.nap.lv)

**Figure 1. The EU funding planning documents**

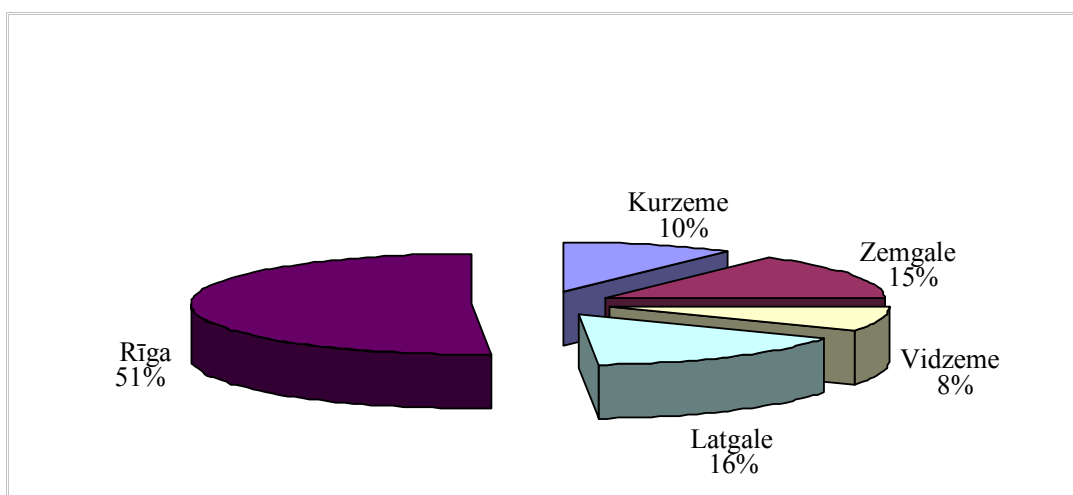
According to the hierarchy diagram, the EU structural funds are the main financial tool for the NDP implementation; therefore all the activities that are designed for the implementation of Operational Programmes (OP) and Operational Programme Supplement (OPS) of National Strategic Reference Framework for the period 2007-2013, should be in compliance with the NDP (Figure 1). The unity of legal, financial and administrative aspects is obvious.

The basis for the allocation of the EU structural funding for the implementation of education and science projects in Latvia for the period 2007-2013 is the analysis of educational institutions activities in terms of regional development. One of the long-term regional development basic principles is a polycentric net of competitive and dynamic residential areas (Figure 2).

In order to provide the effective concentration of the NDP funding, the support is the priority in cases with both the demand and the highest socio-economic return. The support must be planned on the basis of the unbiased analysis of the situation. As concerns the European Commission directives regarding the creation of preconditions of polycentric development for the balanced state development as well as education quality and polycentric development solutions, it is apparent that funds for education will be allocated to prospective and long-term educational institutions.

Educational, including its infrastructure, development strategy is determined in Education Development Guidelines for the period 2007-2013 approved by the Cabinet on September 27, 2006 ([www.izm.gov.lv](http://www.izm.gov.lv)). The guidelines and the NDP envisage the secondary comprehensive, professional and higher education, long-life education and inclusion education development, emphasizing the government's support for the improvement of the education quality and its attractiveness in Latvia's regions.





Source: [www.izm.gov.lv](http://www.izm.gov.lv)

**Figure 2. The amount of European Regional Development Funding (ERDF) for education infrastructure, restructuring and modernisation in the regions for the period 2007-2013**

Significant EU structural funding will noticeably improve the technical provision of schools that is a prerequisite for the growth of the study quality. The plan for 2007-2013 envisages the funding of EUR 200 million for technical modernization of education process to be spent accordingly:

- formation of technical and material basis for the qualitative acquisition of science subjects in secondary educational institutions. It is planned to equip 60% of science classrooms in the secondary schools of Latvia (4 classrooms, i.e., Physics, Chemistry, Biology, Mathematics classroom in each school), along with the teachers' work environment.
- implementation of Operational Programme "Information and Communication Technologies for Education Quality for the period 2007-2013" of the Ministry of Education and Science (MES) and the Secretariat of Special Assignments Minister for Electronic Government Affairs.

Starting from 2007 in the framework of the state programme "The Improvement of Study Quality of Science, Mathematics, and Technologies in Secondary Education" 200 teachers of Science and Mathematics received 200 PCs and 100 multi-media projectors for IT application in the study process.

Regarding higher education institutions, the planning of the EU structural funding for the period 2007-2013 envisages that funding will promote the implementation of polycentric development model and funding concentration in the regional centres, which is determined by the current geographic location of higher educational institutions in the capital of Latvia and regions. The modernization of higher educational study process will be supported within the framework of the 3<sup>rd</sup> Operational Programme "Infrastructure and Service", which was not included in the science infrastructure funding by the 2<sup>nd</sup> Operational Programme "Entrepreneurship and Innovations". The support will be allocated to competitive higher educational institutions (universities, colleges) at the national, and regional level, and in some cases in the district centres in all planning regions. The regional funding quotas have been estimated taking into account the following factors:

- capacity and results of a higher educational institution in the academic year of 2007/2008: number of students, number of awarded academic degrees and professional qualifications, number of academic staff;
- regional development index;
- strategic development index of a higher educational institution for the promotion of territorial development (*a ratio that reflects the future development of academic and scientific potential according to the needs of a region, strategic plans of a higher educational institution and MES policy of higher education in regions*).

Consequently, the training of highly qualified specialists for the state and regions will be arranged to improve the labour structure in regions and promote regional development. The funds will be distributed in the proportion 56% : 44%. Out of planned 35 higher educational establishments (including 2 new colleges) that expect to receive ERDF funds in this group, 14 are located in the regions outside Riga, and the number of students here account for 1/5 of the total number of students (5,000 out of 25,000). Thus one student in a regional higher educational institution will receive funding that on average is 4-5 times bigger than a student studying in one of Riga universities (Table 1).

Table 1

**Regional Quotas for Latvia's Higher Education Institutions**

Region	Number of institutions	Funding, million EUR	% of the total 87 million EU funding	Average funding per one student, EUR
Riga	21	86	56%	4,100
Kurzeme	4	15	10%	12,500
Zemgale	2	20	13%	12,500
Vidzeme	1	6	4%	12,500
Latgale	4	26	17%	12,500
<b>Total</b>	<b>23</b>	<b>153</b>	<b>100%</b>	<b>Average 6,000</b>

Source: MES provisional calculations

Higher educational institutions will receive funding under the conditions of well-thought and good quality projects. Table 2 shows the results of the disposition of the funds for the period 2004-2006. Utilized and planned funding proves that regional higher educational institutions face both a challenge and responsibility.

Table 2

**ERFF for the Modernization of Educational Institutions, Vocational Educational Institutions and National Public Funding for the Period 2004-2013 (LVL)**

The city	ERDF (LVL)
Riga	4,007,552
Liepāja	408,319
Ventspils	403,189
Jelgava	623,200
Valmiera	308,165
Daugavpils	971,349
Rēzekne	531,634
<b>Total</b>	<b>7,133,408</b>

Source: [www.izm.gov.lv](http://www.izm.gov.lv)

Regarding the amount of planned funding for education and science for the period 2007-2013, it should be noted that European Regional Development Fund (ERDF) and European Social Fund (ESF) envisage **EUR 880,898,140 or LVL 619,098,737** for the implementation of Operational Programs, where national public financing share is **15%** of the total sum (Table 3). The biggest investment flow goes to the higher education, thus the presence of a regional higher educational institution might significantly influence the development and attractiveness of the space.

Table 3

**Envisaged Financial Contribution for Education and Science from EU Structural Funds and National Public Funding 2007 – 2013 (EUR/LVL)**

ERDF for education	ESF for research	ESF for education	ERDF for research	Total
EUR 300,406,716	EUR 58,823,529	EUR 241,583,188	EUR 280,084,706	EUR 880,898,140 LVL 619,098,737

The research carried out by the authors on the role of regional universities in the town life and its surroundings show that these institutions have promoted the growth of GDP and the number of active enterprises. For instance, in Liepāja GDP has increased from LVL 1,969 to LVL 3,698 per capita, in Jelgava from LVL 1,556 to LVL 2,086 per capita, in Rēzekne from LVL 3,732 to LVL 2,601 per capita, in Daugavpils from LVL 1,262 to LVL 1,860 per capita. Likewise, the number of economically active enterprises per 1,000 inhabitants has increased: in Liepāja from 15.8 in 2001 to 20.3 enterprises in 2005, in Ventspils from 17.9 to 20.7 enterprises, in Jelgava from 13.7 to 17.9 enterprises, in Daugavpils from 12.8 to 15.8, in Rēzekne from 15.2 to 18.5 enterprises (Regional Development in Latvia, 2007).

The formation of corporate social responsibility plays an important role in the development of the space. Starting from the 1960s of the 20<sup>th</sup> century the idea of corporate social responsibility has emerged in the business environment, but in the 21<sup>st</sup> century the demand for more ethical business processes and actions has increased. The EU Commission (July 2002) published the document “Communication on Corporate Social Responsibility” that invites the businesses to introduce corporate social responsibility both in interior and exterior business environment. In March 2006 the document “Implementing the Partnership for Growth and Jobs: Making Europe a Pole of Excellence on Corporate Social Responsibility” was approved aiming at resource concentration and creation of a flexible dynamic unity of different institutions, which is able to take a lead in developing productive synergy of education, research and innovation; thus becoming a new type of partnership for the implementation of balanced and long-term development. That means that there is a necessity to form corporate social responsibility in the European Union that could bring new dimensions in the space development. The study of corporate social responsibility and the training of staff are organized in several universities, e.g., Business School of Nottingham University in the UK, John Kennedy Management School of Harvard University, the USA etc. The researchers of corporate social responsibility at Harvard University describe corporate social responsibility as overlapping corporate responsibility, corporate management and public policy that form management skills and support a constructive dialogue and cooperation among business, government, society and academic staff (<http://www.ksg.harvard.edu/m-rcbg/CSRI/>).

### **Conclusions and Proposals**

According to the EU guidelines:

1. Regional higher educational institutions have an opportunity to modernise their technologies and facilities due to the EU funding.
2. Regional higher educational institutions have to involve themselves in the activities improving the quality of life for the local community and the respective region.
3. Academic staff of regional universities should energetically participate in the implementation of research findings into practice, their real-life application.
4. The staff of regional universities should be aware of the fact that they are an integral part of the system of corporate social responsibility that promotes the development of the particular space along with the increase of its attractiveness.

### References

1. Corporate Social Responsibility Initiative. <http://www.ksg.harvard.edu/m-rcbg/CSRI/>
2. Eiropas Savienības struktūrfondi izglītībā. <http://www.izm.gov.lv>
3. EU Commission. (2002) Communication on Corporate Social Responsibility in July 2002. <http://trade.ec.europa.eu/doclib/html/12737.4.htm>
4. EU Commision. (2006) Implementing the Partnership for Growth and Jobs: Making Europe a Pole of Excellence on Corporate Social Responsibility. <http://eur-lex.europa.eu/LexUriServ.do?uri=COM:2006:0136:FIN:EN:PDF>
5. Harvey D. (2001) Spaces of Capital: Towards a Critical geography. Routledge.
6. Herwin A. (2001) Corridor Development, a Dialectical and Design-orientated Approach.
7. Paper for WPSC2001 in Shanghai, China. [www.has-architectuur.nl/res/paper55bwpsc200155D.pdf](http://www.has-architectuur.nl/res/paper55bwpsc200155D.pdf)
8. Izglītības attīstības pamatnostādnes 2007.-2013.gadam. <http://www.izm.gov.lv>
9. Lefebvre H. (2007) The Production of Space. Blackwell Publishing.
10. Nacionālās attīstības plāns. <http://www.raplm.gov.lv/lat/>, <http://www.nap.lv>
11. Reģionālās politikas nostādnes. <http://www.raplm.gov.lv/lat/>
12. Reģionu attīstība Latvijā 2006.(2007) Rīga, Latvijas valsts reģionālās attīstības aģentūra, 16-19 lpp.
13. Simmel on Culture: Selected Writings. (1997) Ed. By D. Frisby and M. Featherstone. London, Sage Publications.
14. Soja E. (1996) Thirdspace, a Journey Through Los Angeles and other Real-and-imagined Places. Oxford: Blackwell.
15. Soja E. (2003) Writing the City Spatially. In: City: Analysis of Urban Trends, Culture, Theory, Policy, Action. Volume 7, Number 3, pp. 269-281.

## Systems of Ecolabelling in Latvia and the EU

Sanita Spruģe, Mg.oec. lecturer,  
Department of Business and Management, Faculty of Economics  
Latvia University of Agriculture

### Abstract

Ecolabelling is one of the products labelling systems, the popularity of which is explained by the increased globalisation of problems related to the environment protection. This kind of system development involves not only a consumer, but also the state defining the requirements for the product labelling.

The ecolabelling is one of the voluntary marking methods for products and services in the entire world. It provides the customer with information and possible impact of the product on the environment. Both different product markings and explanations of standard requirements as well as the conclusions of the independent institutions related to the product compliance with the specific criteria, do not convince the consumer about the environmentally friendly origin of the product, wherewith both consumer and manufacturer are interested in attraction of the independent institutions for the evaluation of a product or service.

The granting of specific marking confirms the quality of a product or service, informs the consumer about connatural characteristics or usage preconditions of it; labelling can also serve as a brand. Each of the mentioned markings has its own purpose, however the general aim of labelling is to motivate the manufacturer to produce and supply goods and services, which decrease the negative influence on the environment and increase the consumer's confidence.

**Key words:** Product labelling, ecolabelling, environmentally friendly systems

### Introduction

Consideration of consumers' interests remains the most topical problem within the competition policy of the EU, where it is harder to evaluate the quality of services that can create dissatisfaction of consumers (Špakoviča E., 2007). To facilitate the consumers to make a choice of goods and services, and to avoid the deception, labelling of goods is being performed. In the world, including Latvia as well, there are lots of certification programmes, and labelling marks are created on the national and even regional level.

Ecolabelling is one of kinds of the marking system, the popularity of which can be explained by the increasing globalisation of problems related to the environment protection. Not only consumers and producers are involved in the introduction of such systems, but also the state determining conditions for the goods marking. Besides the producers of goods and suppliers of services commit that the advantage of a distinct products and services market is their direction towards the protection of environment, therefore the labelling serves as advertisement of the product.

In the market, more and more producers offer goods with different labels, signs and certificates, pointing to natural and biological features of the products, their friendliness to the environment, low energy consumption level, usage of recyclable products in production etc. Products labelled this way attract attention of consumers, especially those ones willing to decrease pollution of the surrounding environment, supporting the green lifestyle and willing to ease press on the environment.

Education of consumers as one of the main tasks for the promotion of goods sale has also been set by the states of Western Europe. The European Commission has concluded by its research that national trademarks earn more loyalty among consumers than the EU trademarks (Baraškina I., 2003).

**The aim of the research** is to study and summarise the systems of ecolabelling of Latvian and the EU products and services, and their structure.

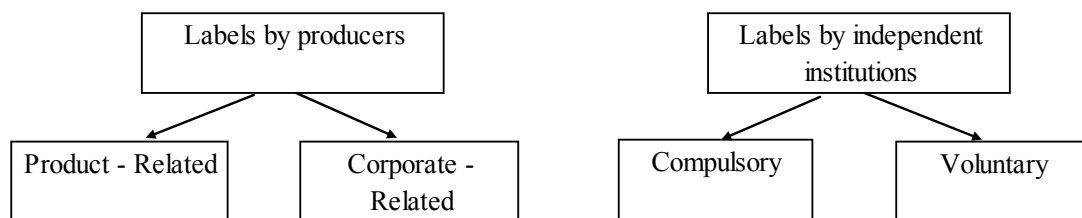
### Tasks of the research:

- to study environmentally friendly labelling systems allowed in Latvia and the EU;
- to observe structural usage of labelling systems.

**Applied methods.** Monographic, descriptive, analytical and synthesis, as well as the method of mathematical statistics are used in the research. The data on the number of certified enterprises in Latvia by the Quality Association of Latvia and the data on ecolabels by the Association of Organizations of Biological Agriculture and Association “Country Traveller” were used to perform the analysis of evaluation of Ecolabelling.

## Results and Discussion

Ecolabelling is one of the voluntary methods for the certification and marking of products and services in the entire world. Ecolabelling provides a consumer with the information on influence of the product on the environment. Ecolabelling effectively acts in a large part of states of the world, and it becomes more and more popular not only among consumers, but also among producers themselves. One of the aims of ecolabelling is to approach consumers caring for the environment, maintenance and supplement of its quality, and to inform them about the features of a product. Giving opportunity to use these products, the producer decreases environmental risk, as well as influences health of people more positively. If consumers demand ecolabelled products, producers adjust to this demand and offer more and more environmentally friendly products on the market. The choice made by consumers changes the behaviour of producers that is followed by the decrease of negative impact on the environment.



Source: *Introduction to Ecolabelling, 2004*

**Figure 1. The classification of Ecolabelling**

International Standardization Organization (ISO) points out 4 basic kinds of voluntary certification (Figure 1) (*Introduction to Ecolabelling, 2004*):

- 1) certification by an independent certification institution, which is based on checking and consideration of the necessity of several definite criteria. The certification includes a full life cycle of the product;
- 2) involvement of a producer in the systems that ensures the compliance of the product with quantitative environmental indicators corresponding to the parameters set by an independent institution and controlled by the same or other independent institution;
- 3) informative self-declaration of the producer on correspondence of the product to the demands of environment protection, and fulfilling definite demands for the energy efficiency.

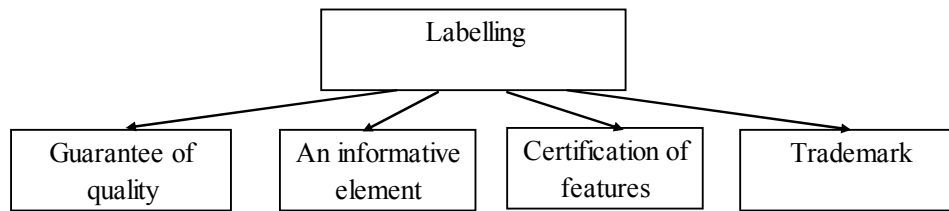
Ecolabelling, besides “green” labels by a producer, is done by independent institutions, which check the correspondence of products to definite criteria.

Neither different goods’ labels nor explanations of standard demands and conclusions by independent institutions on the correspondence of product to definite criteria can assure consumers completely about environmentally friendly origin of a product. It means that both consumers and producers are interested in involvement of independent institutions in the evaluation process of goods or products.

There are several legislative norms for goods labelling set in the Republic of Latvia that are directed towards the protection of consumers’ rights. Special (compulsory) requirements for goods labelling in Latvia are set for the following goods: foodstuffs, fuel consumption and exhaust of CO<sub>2</sub> of new cars, cosmetics, household goods (ovens, air conditioners, dish washing machines etc.), aerosol flasks, detergents, glass articles and footwear. The law “On Protection of Consumers Rights” determines that the information on the label shall not ascribe features which the goods do not possess, as well as deceit buyers that the goods have some specific features (*Patērētāju tiesību aizsardzības likums, Law “On Protection of Consumers Rights”, 1999*).

The word “labelling” is a symbol of caution that points to or informs the consumers on different enterprises, which have already done or are going to undertake the concrete thing. Particular labelling gives

the opportunity to consumers to choose goods or service with desirable result that, in its turn, supports the competitiveness of enterprises, and drives the producer towards more effective use of technologies.



*Source: research done by the author*

**Figure 2. The functions of Labelling**

Provision of a definite labelling to a product certifies its quality (Figure 2), informs consumers on its features or preconditions of use as well as it can serve as a trademark.

Before any goods or service gains the rights to receive labelling, it has to correspond to definite criteria, which are set by experts exploring and analysing the impact of a definite group of goods on the environment. The environmental impact is evaluated during all the life cycle of a product- what raw materials are used in the production, how they are obtained, how the goods are produced, and what happens with goods during their usage and utilisation process, what is the package of the goods. The performance and consideration of these requirements in the enterprise allows optimising the process of production. Therefore it is not to be considered as additional burden for an entrepreneur. It is worth to notice that with the changes of production technologies, the criteria of labelling also change.

In many states all over the world, there are certification systems created or still being created, which can be named as hybrids of eco-certification, since they are narrow focused, for instance, regarding only forest management or chemical industry and/ or provided only for checking one separate environmental factor, for instance, air quality, energy saving, and/ or evaluates only one phase of the product life cycle-usage of the product, its recycling etc.

Internationally acknowledged certification of a product or service quality is the ISO certification system, which performs the merging of the state and private sector interests during the standardisation process. The certification of the production of products or delivery of services delivery indicates to the quality, correspondence to the requirements of environment protection, safety, reliability, efficiency and mutual replaceability, as well as economic efficiency.

According to the data summarised in Table 1 on the number of Latvian enterprises certified by the ISO standards, we can conclude that one enterprise is certified in compliance with the demands of several standards, of which the most topical is ISO 9001 standard. The certification of quality management system (ISO 9001) is implemented almost in all certified enterprises. The systems of environment management (ISO 14001), the systems of management of occupational health of employees and safety (OHSAS 18001) are the most commonly used standards the topicality of which depends on the type of a company activities.

The system of self-control in foodstuff enterprises for safe and harmless food, which includes surveillance and analysis of each stage of food turnover, determines the stages in food turnover that are critical (dangerous) for food safety and harmlessness, and introduces the processes of effective control and monitoring in these stages (HACCP DS 3027E:2002) between 2003 and 2006 it has been introduced only in one agricultural enterprise, in four foodstuff, alcohol and tobacco production and sales enterprises.

We have to notice that the data summarised by Latvia Quality Association, and the breakdown of the enterprises by branches are not complete, and there are observed inaccuracy in this accounting system, which hinders the process for drawing conclusions on the number of certified enterprises.

Table 1

**The number and structure of certified enterprises by activities in Latvia 2003-2006, %**

Type of activities	Number of enterprises	Structure, %	including, %				
			ISO 9001:2000	ISO 14001:2004	OHSAS 18001:1999	ISO 14001:1996	HACCP DS 3027E:2002
Construction	76	18.58	97.37	21.05	27.63	1.32	-
Other services	51	12.47	100.00	3.92	5.88	-	-
Trade	44	10.76	100.00	6.82	9.09	-	-
Transport, storage and communications	31	7.58	90.32	38.71	6.45	6.45	-
Products of metal and metal alloys	24	5.87	95.83	29.17	29.17	8.33	-
Engineering services	23	5.62	100.00	8.70	8.70	-	-
Foodstuffs	20	4.89	85.00	15.00	5.00	-	20.00
Electrical and optical equipment	17	4.16	94.12	23.53	5.88	-	-
Information technologies	15	3.67	100.00	-	-	-	-
Financial mediation, real estate	13	3.18	100.00	-	7.69	-	-
Paper and paper products	12	2.93	8.33	8.33	-	-	-
Wood and wood products	12	2.93	83.33	50.00	25.00	16.67	-
Concrete, cement, adhesive, gyps	10	2.44	100.00	20.00	50.00	-	-
Other social services	9	2.20	77.78	44.44	-	-	-
Social sector	8	1.96	100.00	-	-	-	-
Chemical products	7	1.71	57.14	57.14	14.29	14.29	-
Education	7	1.71	100.00	-	-	-	-
Plastic articles	5	1.22	100.00	60.00	20.00	20.00	-
Electrical supply	4	0.98	100.00	50.00	50.00	50.00	-
Print shops, publishers	4	0.98	100.00	50.00	-	-	50.00
Textiles	3	0.73	100.00	66.67	33.33	-	-
Machinery and equipment	3	0.73	100.00	66.67	66.67	33.33	-
Shipbuilding	3	0.73	100.00	-	-	-	-
Other transportation equipment	3	0.73	100.00	-	-	-	-
Health and social care	3	0.73	100.00	-	-	-	-
Mining	2	0.49	100.00	-	-	-	-
Leather articles	2	0.49	100.00	-	-	-	50.00
Medical remedies	2	0.49	-	50.00	-	50.00	-
Articles of mineral deposits	2	0.49	100.00	-	-	-	-
Gas supply	2	0.49	50.00	50.00	-	-	-
Otherwise non-qualified industry	2	0.49	100.00	-	-	-	-
Water supply	1	0.24	100.00	-	100.00	100.00	-
Agriculture and fisheries	1	0.24	100.00	-	-	-	100.00
Total	421	100.00	X	X	X	X	X

Source: data by Latvia Quality Association and calculations done by the author

The data of Table 1 show that the highest number of certified enterprises is observed in construction, trade and other services (service, repair works, security etc. service), transport, metal alloys and food processing sectors and regulated branches. These are the sectors whose supplied services or produced goods



have to guarantee conformity with high quality requirements due to their dangerousness for health, life or property of consumers.

**Table 2**

**Available ecolabelling certificates of environmentally friendly activities in Latvia in 2007**

Indicators	Ecolabelling				
	Green certificate	Eco flower	Ecoproduct of Latvia	Green key	Blue flag
Sector	Tourism service	Goods production and services	Goods and products production and service	Tourism service	Tourism service
Categories	Country houses, guest houses, holiday houses and campings	Goods and services (except food, beverages, pharmaceutical remedies and medical goods)	Foodstuff, their articles, supplements, seeds, plants, soil ameliorators, fodder, rural tourism, education, organizing of enterprises etc.	Hotels, camping, restaurants, hostels	Swimming places, yacht ports
Foundation year	2001	2005*	1995**	2001	1998
Responsible institution	Country Traveller	Agency of Environment, Geology and Meteorology of Latvia	Association of Organizations of Organic Agriculture of Latvia	Foundation of Environmental Education in collaboration with Ministry of Environment	Club of Environment Protection in collaboration with Ministry of Environment
Number of products	-	-	135	...	...
Number of enterprises	59	3	131	...	...

\*In Europe since 1992

\*\*Registered in 2002

Source: research done by the author

Besides the standards elaborated by the International Standardization Organization (ISO), the producers of goods and service can receive also other certifications of meeting environmental demands and requirements of good management. Available certifications of environmentally friendly activities in Latvia are summarised in Table 2. Each of the named labelling has a definite aim, which could motivate producers and service suppliers to produce and supply goods and services that reduce the bad impact on the environment and increase the trust of consumers. The certificate is a witness of “green management” strategy with the choice of environmentally friendly technologies, methods and detergents, offering healthy food and keeping this idea of “green thinking” also in employees.

The evaluation of ecolabelling systems in Latvia (Table 2) may lead to the conclusion that Latvia does not have long history and action of ecolabelling. The label Eco flower, which is set by the EU norms, is assumed as the most unpopular among entrepreneurs. Since awarding of this label allows observing the opportunity to diminish the expenses of enterprise related to the consumption of water, electricity and other resources (because it is important to monitor all the time the amount of these exposures,) its popularity needs to be risen.

Additionally to the certified products and services for environmentally friendly lifestyle of consumers, the labels of international meaning available in Latvia, Europe and all over the world are summarized in Table 3.

**Table 3**

**Most Popular Ecolabelling Certificates of International Meaning**

Name	State	Aim
Northern Swan (good choice of environment)	Scandinavia	To acknowledge friendly attitude towards the environment by commonly used and environmentally dangerous products. Detergents, paper, textiles, electricity delivery, transportation are labelled.
Blue Angel	Germany	To show safe, healthy and economically profitable products for the society and environment. Stationery, furniture, electrical appliances, heating elements, constructions, hygiene goods, accumulators, and services are labelled.
White Rabbit	Europe, the USA, Canada	Acknowledges that no experiments with animals have been performed for the production of a product or its components.
TCO (Confederation of Professional Employees)	Sweden	Label for mobile phones, office furniture, computers and their appliances, which meet definite requirements regarding energy efficiency, safety of work place and impact on the environment.
Biological Agriculture	European Union	Labelling of agricultural products and food containing at least 95% of products from organic farming.

*Source: research done by the author*

Besides the ecolabelling mentioned in Table 3, there are different voluntary environment concordant labelling systems that are assigned also to the goods in Latvian market. These are the labels that show some environmentally friendly features of the product, but they do not witness the meeting of environmental requirements. They are:

- Green spoon or Qualitative Product of Latvia – certifies that 75% of the used raw materials are produced or grown in Latvia, and they meet the quality requirements;
- Green spot – witness that the producer of a package, distributor or importer of the goods have paid for the recycling of the package;
- Green belt – participant of the programme of voluntary management of the used packing, collects, sorts and recycles packing into recycled raw materials;
- Mark for electronic and electrical appliances – shows that the goods after end of their life cycle must not be wasted in litter- bags, but they have to be delivered to special places. It is a mark that can be found on all electronic and electrical appliances that are obtained in the EU after August 13, 2005;
- Symbol of recycling – marks goods, which can be recycled or marks goods or their packing, which are completely or partially produced from recycled raw materials. It is a mark that can faint consumers, because they do not know if the goods are recyclable or already a recycled product.

The research results in the EU and Latvia show that consumers have an approach to simple, precise, accurate and scientifically based information on environmentally friendly goods and services that help choose and obtain the necessary goods and services as well as provide the competitiveness of the enterprises.

In the varied system of products labelling, the consumers have the opportunity to choose and trust international or national labelling also in the future. Creation of new kinds of labels could only faint consumers looking at the already abundant mosaic of labels. Further research is needed on the issues on the type of labels consumers prefer, and whether the high requirements for obtaining the labels promote their popularity in the local market.

### Conclusions and Proposals

1. Ecolabelling of products is connected with the market mechanisms - demand and supply; if consumers turn to "the green" lifestyle, the producers have to adjust.
2. Latvian market ensures the existence of both Latvian and internationally awarded labels of goods and services, which provides consumers with the information on the origin, compounds, usage and environmental influence of products.
3. The wide range of product labels in Latvia market burdens or even faints the choice of consumers. There are few regulated labelling systems on the market. The use of ecolabelling is based on the initiative of producers.
4. Different marks of goods, standard requirements of meeting definite criteria burden the understanding both of consumers and producers, therefore both parties are interested in the attraction of independent certification institutions for the evaluation of goods or products.
5. Certification and products labelling is widely used in the sphere of entrepreneurship connected with health, life and property protection of consumers.
6. Certification process and eco-labelling procedure give an opportunity to entrepreneurs to diminish production costs, as their conformity criteria are directed towards saving energy resources and meeting requirements for environmental protection.
7. The government has to introduce the system of business administration advantages and allowances for the sales of products and services. It would decrease the administrative burden to certified enterprises and enterprises, which have labelled their goods with ecolabels, and would promote their competitiveness.

### References

1. Baraškina I. Bioloģiskās lauksaimniecības produktu preču zīmes Latvijā un citur Eiropā. (Trademarks of Products of Biological Agriculture in Latvia and Europe) *Agropols* Nr.9, 2003, 11.lpp.
2. *Ekomarkējums* (Ecolabelling)[link] [seen on November 10, 2007] Available: <http://www.zb-zeme.lv/paterins/?id=20>
3. *Introduction to Ecolabelling* [link]: Global Ecolabelling Network Information paper 2004 [seen on November 10, 2007] Available: [http://www.gen.gr.jp/pdf/pub\\_pdf01.pdf](http://www.gen.gr.jp/pdf/pub_pdf01.pdf).
4. Par bioloģisko tirgus programmu (On Biological Market Program) *Latvijas Bioloģiskās lauksaimniecības asociācijas biļetens* Nr.11 (59), 2007.gada 03.novembrī, 4.lpp
5. Špakoviča E., G.Moskvins Patērētāju ekonomiskās intereses un to aizsardzība ES vienotajā tirgū. (Economic Interests and their Protection in the United Market of EU) *Proceedings of International Scientific Conference Economic science for Rural Development*, Nr.13, Jelgava, 2007., p. 144-151.
6. Patērētāju tiesību aizsardzības likums (Law of Consumers Rights Protection): LR likums (1999) *Latvijas Vēstnesis* 104/105 1.apr.
7. LBLOA preču zīmes „Latvijas ekoprodukts” tirgus pētījums (Market Research of LBLOA Trademark “Ecoproduct of Latvia”) [link]: Latvijas iedzīvotāju aptaujas atskaite (Report of Questionnaire Latvia Inhabitants) [seen on January 12, 2008] Available: <http://www.ekoprodukti.lv/?id=157> seen on 14.12.2007.

## Sources of Feed Supply in Comparison with the Effectiveness of Pig Production<sup>38</sup>

Elżbieta Szymańska, PhD, senior lecturer  
Warsaw University of Life Science

### Abstract

Fodders constitute the main part of costs for animal production. Depending on the production direction their share in the total costs of animal production is estimated at the level of 50-80%. Due to that even small changes in the costs of fodders lead to an increase or decrease of the total costs.

The aim of this research was to assess the effectiveness of pig production depending on the type and source of feeds. Target selection of the sample was used in the studies. There were selected farms which produced 100 and more fatteners per year and maintained accountancy within the Polish FADN. 419 farms were encompassed by the analysis, and the data for 2004 were obtained. The farms were divided into three groups. The analysis has taken into consideration the value and structure of fixed assets, organization of crop and animal production, the amount of direct and indirect costs, and achieved income.

The results show that the lowest direct and indirect costs are observed on the farms that feed the animals with self-produced feeds, while the highest costs are paid by the farms which supply the industrial feeds. The highest income per farm and per livestock unit is gained by the farms, on which industrial feeds dominate as the feed used. The highest efficiency of use of one unit of space, assets and fully employed person was observed on farms relying on the purchasing cereals feed.

**Key words:** pig production, fodders, direct and indirect costs, effectiveness

### Introduction

Fodders constitute the main part of costs for animal production. Depending on the production direction their share in the total costs of animal production is estimated at the level of 50-80% (Ziętara W., 1979, Sznajder M., Chmurak M., 1981). Due to that even small changes in the costs of feed lead to an increase or decrease of the total costs. In such a situation the fodders given to the animals should:

- cover the entire needs of the animals for energy, proteins, vitamins and minerals;
- be of high quality;
- be easily digestible and of high rate of nutrients assimilation;
- have low cost of provision (Szymańska E., 2003).

At most Polish farms, pig feeding is currently based on fodder concentrates. The above fact results from higher usefulness of grains in intensive fattening of pigs as well as lower labour intensity connected with the use of fodder concentrates in feeding. Concentrate fodders used by farms may constitute their own produce or be purchased. The progressive restructuring and specialization of Polish animal husbandry sector effects with increased need for industrial fodders (Minakowski D., Tywończuk J., 2003). This kind of fodders develops with the efficiency of pigs feeding (Niemczyk J., 1990).

The research conducted by Okularczyk (2001) indicates that in case of pig breeding with application of fodders purchased outside the farm, the share of costs of fodders and fodder additions in open cycle with production output of 350 pigs per year accounted for 64%, whereas in closed cycle with production output of 5,000 pigs – 60% respectively. If, however, the farm produced fodders at its own effort, the said share was lower. In the case of closed cycle with production output of 550 pigs it accounted for 56%, and in the case of open cycle with production output of 500 pigs – 44% respectively. The highest share of fodders in the structure of costs of pork production is also confirmed by Siarkowski and Maciejewski (2005).

---

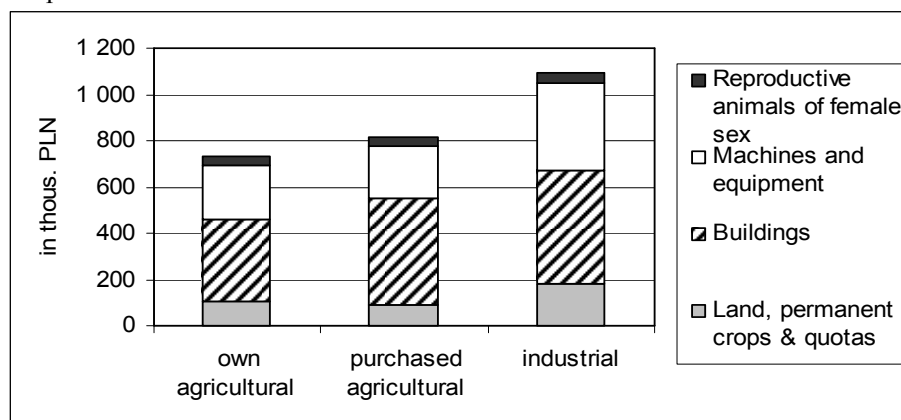
<sup>38</sup> The research is financed from the means on science in for 2005-2007 as investigative project number 2 P06Z 079 29

Apart from the scale of production, breeding cycle and unit efficiency of livestock, output livestock profitability is determined by the costs of fodders. Standardisation of animal feeding with fodders characterised with well familiar nutritional values and low cost of acquisition may contribute to economic success in the breeding of all livestock species.

The aim of this research was to assess the effectiveness of pig production depending on the type and source of fodders. Target selection of the sample was used in the studies. There were selected farms which produced 100 and more fatteners per year and maintained accountancy within the Polish FADN (Farm Accountancy Data Network). 419 farms were encompassed by the analysis, and the data for 2004 were obtained. The farms were divided into three groups. The analysis has taken into consideration the value and structure of fixed assets, organization of crop and animal production, the amount of direct and indirect costs, and achieved income. Moreover in studies the information of GUS (General Department for Statistics), IERiGŻ-BIP (Institute of Economics of Farming and Food Economy) and subject literature surveys have been used. The analysis of collected data was processed by descriptive method, and tabular and graphic statistics. It was impossible however to use more sophisticated statistical methods due to the lack of primary data from farms. The information collected by the FADN is protected. In this situation, to make possible this research, the IERiGŻ-PIB, could only provide the data for given types of farms.

### ***Result and discussion***

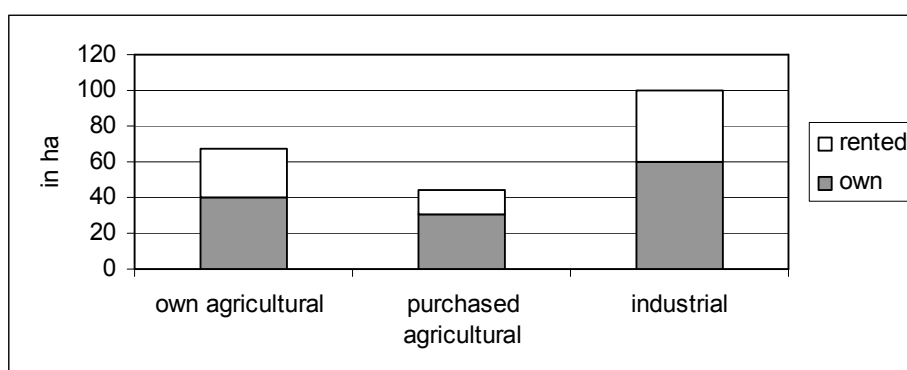
These farms where own production fodders dominated in pig feeding demonstrated the lowest value of fixed assets averaging to PLN 729,000 (Figure 1). In case of entities using the majority of agricultural fodders – however, purchased – the value of assets was higher by PLN 83,000 on average. A different situation was observed at farms which based feeding on industrial fodders. In this group the value of assets was the highest, amounting to PLN 1,094,000. In all farm groups involved, the structure of property was dominated by buildings, followed by machines and equipment. In farms which used the majority of purchased agricultural fodders in livestock feeding, the share of buildings in the value of assets was nearly 57%, with the participation of machines and equipment value lower by half. Participation of the latter elements was the highest in farms which used the majority of industrial fodders in pig feeding. Similarly, the share of land in assets value was the highest in this group, resulting from area of those farms and better equipment in crop cultivation machines.



Source: own research

**Figure 1. Value and structure of total fixed assets in farms**

Farms with the smallest areas were recorded in group two, whereas farms with the largest areas were present in group three (Figure 2). The average utilised agricultural areas (UAA) owned by the farms in the case of entities which used the majority of purchased agricultural fodders in the feeding of pigs were 30.8 ha. The area was greater by 9.4 ha for entities basing on own production fodders, while in those using industrial fodders – it came to 60 ha. Moreover, farms with the smallest area used 13.5 ha of rented UAA on average. In group one, the area of rented UAA was nearly two times higher, and in group three it averaged to 39.5 ha.



Source: own research

**Figure 2. Own and rented utilized agricultural area in farms**

Mainly grains dominated in the structure of utilised agricultural areas of the examined farms, accounting for nearly 87.0% the UAA in the first two groups (Table 1). This involved the use of grain fodders in pig feeding as well as smaller area of farms in group two. As far as farms using the majority of industrial fodders are concerned, the share of grains was lower and covered 3/4 of UAA. In this group, over 1/5 of the area was occupied by remaining field crops, dominated by sugar beets and rape. In the remaining farms, the share of field crops different than grains amounted to 6.9% in group one up to 7.6% in group two. The percentage of fodder crops, due to low numbers of ruminants, fell in the range from 4.2 to 6.1%. In all groups of farms, the smallest area was occupied by orchards, vegetables and flowers.

**Table 1**

**Structure of utilized agricultural area in farms [in %]**

Specification	own agricultural	purchased agricultural	industrial
Cereals	86.7	86.9	74.4
Other field drops	6.9	7.6	20.7
Forage drops	6.1	5.2	4.2
Vegetables, flowers and orchards	0.3	0.3	0.7

Source: own research

Pigs dominated as livestock in the analysed entities on average constituting 128.5 up to 153.6 livestock units (LU). In terms of other livestock species, some of the farms bred cattle, which on average involved 2 LU in group two, 3.4 LU in group one and 7.3 LU in group three (Table 2). Sheep and goats were recorded in a small percentage of farms, those using the majority of purchased fodders in livestock feeding. Moreover, poultry was recorded in group two, on average constituting 1.4 LU.

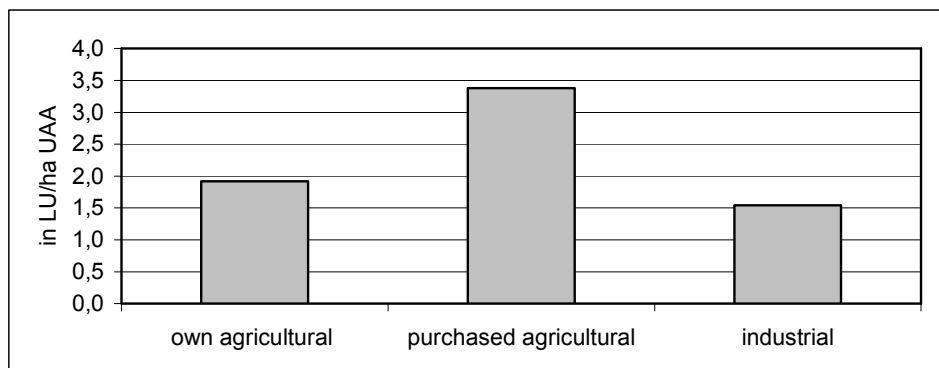
**Table 2**

**Number of animals in LU in farms**

Specification	own agricultural	purchase agricultural	Industrial
Pigs	128.5	149.7	153.6
Dairy cows	1.3	0.8	2.5
Other cattle	2.1	1.2	4.8
Sheep and goats	0.0	0.2	0.6
Poultry	0.0	1.4	0.0

Source: own research

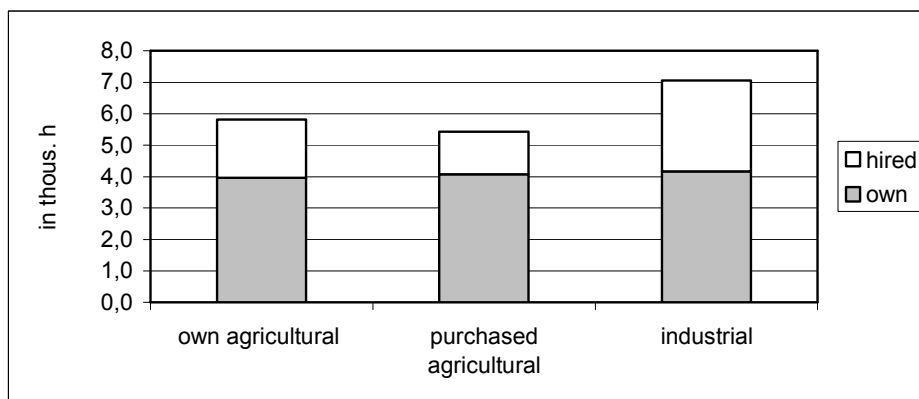
The highest stocks of pigs were characteristic for farms using the purchased agricultural fodders (Figure 3). In this group, they averaged to 3.38 LU per 1 ha of UAA. High concentration of animals on a limited area of the UAA probably hindered the management of excrements. On the other hand, in group three the stocks of pigs per area were more than half lower, despite a similar number of animals of this species. This resulted from a greater area of those farms. In the entities using the majority of own production grains, pig stocks averaged to 1.92 LU per 1 ha of UAA.



Source: own research

**Figure 3. Stock rate of pigs in LU per 100 ha UAA**

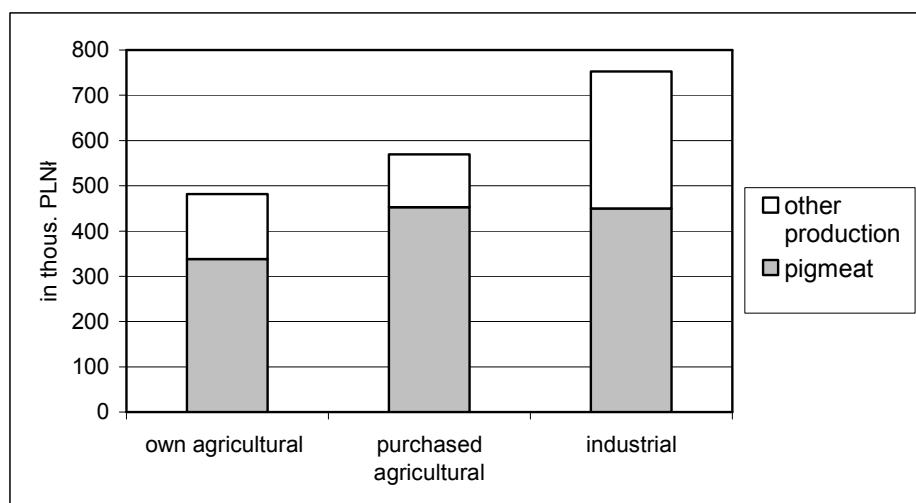
On average, own labour input on operating activities in the analysed farms amounted to 4,000 hours per year (Figure 4). Greater differences between the distinguished groups of farms were recorded in terms of hired labour. The data indicates that hired labour was most frequently applied in the largest farms using the majority of industrial fodders in pig feeding. In this group, the average hired labour input amounted to 2,891 hours per year. In the entities using the majority of own production grains in the feeding of livestock, hired labour input was lower by some 1,000 hours per year, whereas in farms basing on purchased agricultural fodders it amounted to 1,360 hours per year. Thus recalculated into 1 ha of UAA, hired labour input was similar and amounted to 27.6 h in group one up to 30.7 h in group two.



Source: own research

**Figure 4. Total labour input in farms**

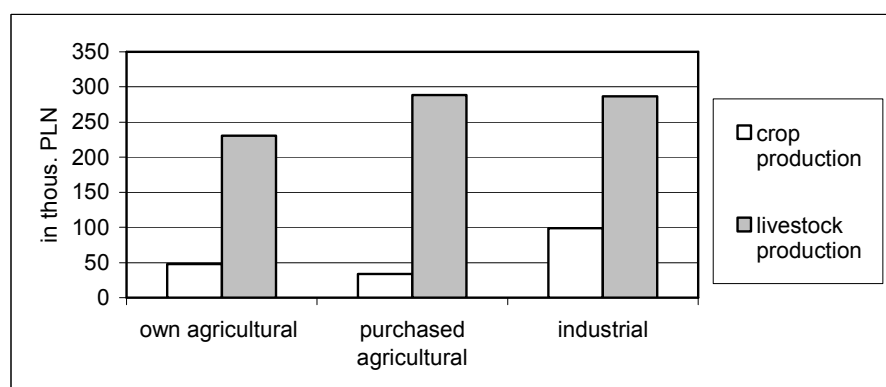
Gross value of final production of the analysed farms was dominated by pork production (Figure 5). Its lowest value was recorded in group one, at ca. PLN 338,000. In the remaining groups of farms, it was higher by some PLN 110,000. The participation of production different than pork was related to size of the UAA.



Source: own research

**Figure 5. Total output in farms**

The highest percentage of other production was recorded in farms using the majority of industrial fodders in livestock feeding. In this group, the percentage of production different than pork averaged to 40.2%, including 22.5% of grains, and 13.0% of sugar beets and rape. In group one the participation of other production was lower by 10.4%, and in group two – by 19.7% respectively. Therefore, the figures indicate that farms with smaller UAA specialised in the production of pork.

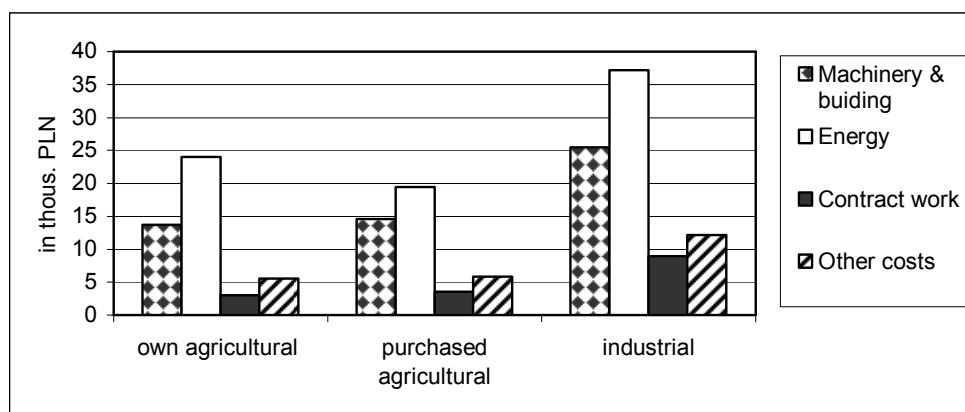


Source: own research

**Figure 6. Direct costs of crop and livestock production**

The analysed farms differed in terms of costs incurred. The highest level of direct costs incurred on output crops was recorded in the group basing on industrial fodders in livestock feeding. In this group, the said costs averaged PLN 99,000 (Figure 6). In other farms their level was lower: nearly two times lower in group one and three times lower in group two. Consumption of mineral fertilisers dominated in the structure of those costs. Direct costs incurred on output livestock were on a similar level in farms of groups two and three. This was related to similar livestock headage in those farms as well as fodder purchases. Lower (by some PLN 50,000) costs of output livestock were only recorded in group one. Fodders dominated in the structure of those costs, constituting from 91.0 to 93.0% of output livestock direct costs. Other direct costs of output livestock accounted for 4.7 up to 5.7%.

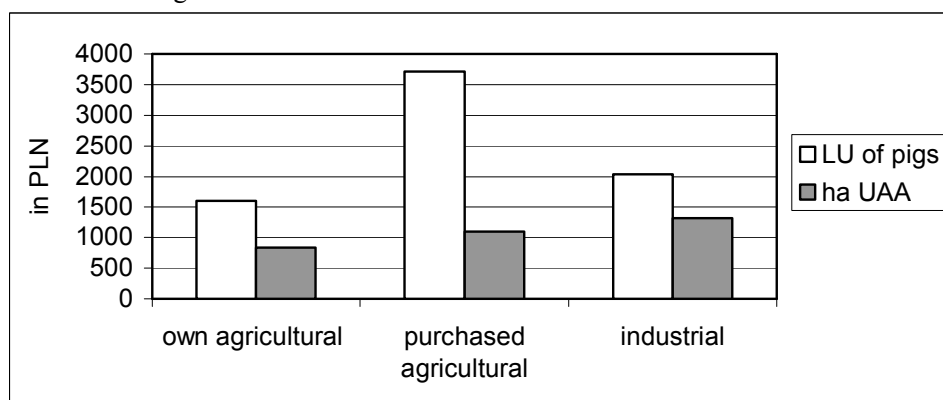




Source: own research

**Figure 7. Types of general farming costs**

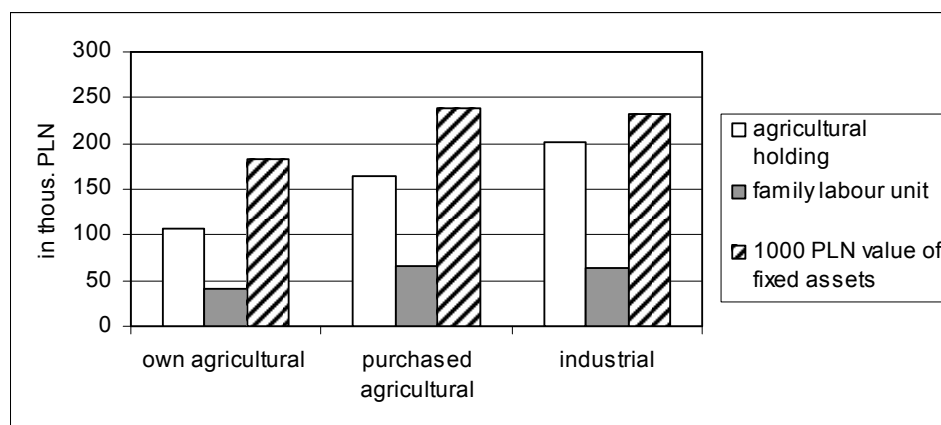
The highest general farming costs were recorded in farms using the majority of industrial fodders in livestock feeding (Figure 7). In those entities the costs averaged to PLN 84,000. Nearly two times lower costs were recorded in the remaining groups of farms. The costs of energy consumption dominated in the structure of general farming costs. In farms using purchased fodders, their share accounted for 44.0%, whereas in the entities basing on own production fodders – for 51.8% respectively. Moreover, a significant percentage of general farming costs concerned the costs of machine and building maintenance, whose share fell in the range from 29.6 to 33.6%. In addition, services were used more often by farms basing on industrial fodders in livestock feeding.



Source: own research

**Figure 8. Income per 1 ha UAA and per 1 LU of pigs**

Despite high costs of production, the highest level of agricultural income was recorded by farms with dominating participation of industrial fodders in pig feeding, followed by the entities using purchased agricultural fodders (Figure 8). In the former group, the average farm income amounted to PLN 202,000, whereas in the latter it was by PLN 38,000 lower. In case of farms using the majority of own production fodders in livestock feeding, the level of agricultural income was the lowest, both per farm and per full time employee. This group also recorded the lowest efficiency of fixed assets use. In the remaining farms, the level of agricultural income per PLN 1,000 of fixed assets was higher by over PLN 50.



Source: own research

**Figure 9. Income per agricultural holding, person employed at full-time and PLN 1,000 value of fixed assets**

Different relations appeared after the recalculation of agricultural income per 1 ha of UAA (Figure 9). The highest income per unit of area was recorded in farms with a dominating share of purchased agricultural fodders in livestock feeding. In farms basing on industrial fodders, the said income averaged PLN 2,000, whereas in group one – PLN 1,600 only. Per 1 LU of pigs, the highest income was recorded in farms using the largest quantity of industrial fodders, whereas the lowest income was recorded in the group using the majority of own production fodders in pig feeding.

## Conclusions

Research results relate to the farms which conducted their accounting, but may also be useful in relation to other agricultural producers specialising in pig breeding.

1. The analysed farms differed in terms of fixed assets value. Farms basing on industrial fodders demonstrated the highest values of fixed assets. Those were the entities with the largest UAA, which moreover rented large utilised agricultural areas. Their property structure was dominated by buildings, machines and equipment. This was connected with large areas of those farms and higher mechanisation of labour. What is more, these entities were the ones to use hired labour most often.
2. Grains dominated in the UAA structure of the analysed farms accounting for nearly 87% in farms using own production fodders and purchased agricultural fodders. This was connected with the use of grains in pig feeding and smaller areas of farms in group two. In the entities using the majority of industrial fodders in nutritive doses, the participation of grains was lower and covered 3/4 of the UAA. In this group, over 1/5 of the area was occupied by remaining field crops. However, the high share of grains in the analysed farms prevented application of proper crop rotation.
3. Pork dominated in the production value structure of the analysed farms constituting from 70.0 to 80.0% in farms which used agricultural fodders. This was connected with high stocks of pigs, particularly in the entities dominated by purchased agricultural fodders. High concentration of livestock in those farms could, however, hinder excrement management. Only the farms basing on industrial fodders recorded a higher share of production different than pork, particularly of output crops, at over 40.0%.
4. The lowest direct costs incurred on output crops and output livestock were recorded by farms basing on own production fodders in livestock feeding, whereas the highest costs were recorded by farms using the majority of industrial fodders. The consumption of mineral fertilisers dominated in the structure of those costs. Directs costs of output livestock were on a similar level in case of farms using purchased fodders. This resulted from similar headage of livestock at those farms as well as from fodder purchases. In their structure, the highest participation concerned fodders.
5. Despite low costs of production, the lowest level of agricultural income was recorded by farms basing on own production fodders in livestock feeding. Per farm and per 1 LU of pigs, the highest income was recorded by farms with dominating participation of industrial fodders in nutritive doses. On the other hand, utilisation efficiency per unit of area, full-time employee and fixed assets was the highest in case

of farms basing on purchased agricultural fodders, which was connected with the smallest area of those entities and the lowest hired labour input.

### ***References***

1. Minakowski D., Tywończuk J., 2003: Żywnienie zwierząt na tle wymagań intensywnej produkcji zwierzęcej. Raport Rolny nr 24/25.
2. Niemczyk J., 1990: Wpływ pasz treściwych na efektywność żywienia zwierząt. Przegląd Hodowlany nr 1.
3. Okularczyk S., 2001: Opłacalność produkcji trzody chlewnej w 2000 roku. Trzoda Chlewna nr 2.
4. Siarkowski Z., Maciejewski M., 2005: Energetyczne warunki rozwoju chowu trzody chlewnej w Polsce. Motoryzacja i Energetyka Rolnictwa nr 7.
5. Sznajder M., Chmurak M., 1981: Wybrane zagadnienia do ćwiczeń z ekonomiki i organizacji produkcji zwierzęcej. Skrypty AR w Poznaniu, Poznań.
6. Szymańska E., 2003: Koszty produkcji pasz w gospodarstwach rolniczych. Wieś Jutra nr 4 (57).
7. Ziętara W., 1979: Jak zorganizować produkcję pasz w gospodarstwie rolnym. W: Pasze, produkcja i wykorzystanie. PWRiL, Warszawa.

## Importance of Estonian Forest Management Societies in the Context of New Political Economy

Eve Tomson, Andro Roos  
University of Tartu

### Abstract

The present annotation is about our planned article, which studies the importance of social and economic co-operation in Estonian forestry. In our article we will bring out our concept for improving Estonian forestry co-operation and provide suggestions for raising its efficiency.

Due to the fact that most of Estonian forest land is owned by private capital, the necessity for private forest management has arisen. This kind of private forest management, which would be beneficial and environmental friendly, is a total obligation of private forest owners. To make such activity possible and easier, private forest owners are joined into specific forest management societies

Co-operation in forestry is ensured in two main fields: social co-operation and economic co-operation. Mainly LEPP is responsible for dealing with the first field. Economic co-operation in turn is coordinated by local forest management societies. Economic co-operation in forestry is important and beneficial due to the following objective reasons. First, the co-operation gives forest owners the possibility to benefit from positive scale effect: selling products together raises product quantities and prices. Second, if there exists an acting forest management society, there is no need for intermediary companies, because a forest society can itself function as an intermediary between its members and end consumers. Third, the membership in forest management society raises specific competence of forest owners.

The aim of this article is to show the importance of economic co-operation between the forest owners by bringing out theoretical importance of co-operative form of firms and linking it to the present situation in Estonia.

**Key words:** Estonian forestry, co-operation, forest co-operatives, institutional economy, forest

### Introduction

Forests are one of the most important resources of Estonia. In Estonia, forests and rural life have been historically related. In the viewpoint of social development, forestry is important as employment provider. In many rural areas of Estonia, forestry is the main industry that offers employment. Also, tax revenues from forestry give a considerable part to the budgets of local governments. For rural people, wood is an important resource of energy.

Forests can be divided into three major categories: state, firm and private forests. The owner of state forests is Estonian government, as firm forests belong to different firms. Their activities can be described as enterprise-oriented. The owners of private forests are individuals – this makes this kind of forest management property-oriented.

A great part of former farmsteads has been afforested during the last 50 years. According to the data of the Estonian Land Register, over 300,000 ha of forest lands are possessed by firms, which is 30 times more than before World War II. Economically this kind of concentration of forest land reduces local vacancies and income of rural people.

In the course of forest land restitution, 55,000 forest real estates have got owners. It covers about 700,000 ha of forest land. The average area of a forest real estate in Estonia is ca. 12 ha. Cadastral units smaller than 5 ha form 61% of all cadastral units, while only 19% of all are forest land. 600,000 ha of former private lands are still in possession of the state.

In our point of view, it is important that in Estonia the co-operation between private forests owners that would help them budget their forests economically and efficiently in order to gain profits would exist. They would also help forest owners to use the resources in a way that would save the environment and prevent selling forest lands to domestic and foreign firms.

The aim of the article is to show the importance of economic co-operation of forest owners. For that reason our research method is to bring out and analyse the theoretical importance of co-operative firms and link it to the present situation in Estonia.

### Economic Interpretation of Co-operatives

According to institutional economics, co-operatives should be handled as firms. It is relevant to mention that every firm has a side of property and a side of enterprise (Roos 2007: 12). Examining co-operatives from the property side, it appears that they differ from capital enterprises due to the fact that customers of co-operatives are at the same time also members (owners) of the firm. From the enterprise side, co-operatives are often similar to other form of firms. Many earlier studies emphasize different institutional problems of co-operative firms, such as common property problem, the horizon problem, the monitoring problem, the influence cost problem, the decision problem, the profit-sharing problem etc.

Nevertheless, the literature of organisational economics explains the existence of co-operative firms through their ability to economise on transaction costs and to develop countervailing power (Valentinov 2007: 55). Through co-operatives as collective organisations, it is possible to internalise crucial transactions into a firm collectively owned by the holders of transaction-specific resources. These stakeholders can avoid potential threats to the quasi-rent of their investments by outside opportunists' by using the form of co-operative (Bonus 1986: 335).

The achievement of a balanced view of the institutional advantages and disadvantages of co-operatives was the objective of Hansmann's theory on enterprise ownership. Hansmann explained the existence of different organisational forms such as investor-owned firms, employee-owned firms, co-operatives, and mutual and non-profit enterprises by comparing market contracting costs and ownership costs faced by their patrons (i.e., agents transacting with the firm) (Hansmann 1988, 1996). Applying this framework to agricultural co-operatives, he argued that farmers generally faced high market contracting costs for two major reasons:

- 1) they had weak market power compared with their up- and downstream trading partners;
- 2) in dealing with these partners, they might be confronted with information asymmetries.

Many works (Hansmann 1988, 1996; Staatz 1987) can lead to the recognition that farmers often find themselves in a disadvantageous position in relation to their trading partners, and can use co-operative organisation to compensate for these disadvantages. The disadvantages of farmers acting individually come from their low bargaining power.

Bargaining power is a concept related to the relative abilities of parties in a situation to exert influence over each other. If both parties are on an equal footing in a debate, they will have equal bargaining power such as in a perfectly [competitive market](#) or between an evenly matched [monopoly](#) and [monopsony](#).

Bargaining power is often expressed as a ratio of a party's ability to influence the other participant to the costs of not reaching an agreement to that party as follows (Bargaining power 2007):

- 1)  $BP_A(\text{bargaining power of A}) = (\text{benefits and costs that can be inflicted upon B}) / (\text{A's cost of not agreeing})$ ;
- 2)  $BP_B(\text{bargaining power of B}) = (\text{benefits and costs that can be inflicted upon A}) / (\text{B's cost of not agreeing})$

If  $BP_A$  is greater than  $BP_B$ , then A has a greater bargaining power than B, and the resulting agreement will tend to favour A. The reverse is expected if B has a greater bargaining power instead. This formulation and more complex versions with more precisely defined variables have been utilized to describe the behaviour of parties to a negotiation, and determine where their behaviour would fall within the possible options they might agree to. Even in a situation of seeming equality, there may be underlying factors that more complex models of bargaining power tend to include.

However, to indicate how the bargaining power of farmers is linked to lower costs and higher profits of farmers, one should carry out a simple transmutation in preceding formulas. Let us assume that A is a group of small farmers and B is a single monopolistic (towards farmers and not necessarily towards the market) middleman of the products of farmers. Farmers make expenses per unit of product in the amount of  $p$  and sell the unit to middleman with  $a$ . Hence, the middleman makes expenses per unit in the amount of  $a$ , but sells the unit to market with  $b$ . So we can transform the preceding formulas as follows:

- 1)  $BP_A = (b - a) / p$
- 2)  $BP_B = (a - p) / (b - a)$

If farmers formed a co-operative that would be monopolistic to at least some of downstream trading partners, it would likely be possible to lower  $p$ . This comes from lower costs generated by better bargaining power towards the downstream trading partners of A and also lower transaction costs that come, i.e., from lower interacting costs with trading partners. Analysing these formulas, one can state that lowering  $p$  raises bargaining power of A (farmers) due to the fact that disagreement with B (middleman) is less costly. On the other hand, lowering  $p$  rises also bargaining power of B, because  $(a - p)$  or extra charge of A raises. This means that there would be more to win now for A when interacting with B, and it makes A more prone to bargaining.

If farmers would also co-operate in bargaining with the upstream trading partners, it would be the case of evenly matched [monopoly](#) (A) and [monopsony](#) (B). It would make their bargaining power equal. If the co-operative of the farmers could also take over the middleman's functions, it could directly bargain with the market, asking price in the amount of  $b$ .

Thus, it would be beneficial for farmers to form a co-operative which would monopolistically bargain with the monopsony middleman or with market directly (in this case farmers' co-operative would not necessarily be monopolistic similarly to the middleman. Forming a co-operative would now help farmers to get better price for their products through the fact that they co-operated in developing a countervailing power to the middleman and economising their transaction (internalisation of many transactions into one co-operative) costs.

Farmers could also earn extra quasi-rent by co-operating in trading with the downstream partners due to the fact that monopolistic behaviour would be possible towards some of them. Still, as it comes from the formulas, there may be no use to form just this kind of co-operative, otherwise it would also raise the middleman's bargaining power and would give him a chance to earn extra quasi-rent at the expense of co-operative of farmers.

### Historical Overview of Estonian Forestry

Interest towards the co-operation among private forest owners was extremely high before World War II. Forest management societies enabled farmers to get the state aid, build on different plantations and sell wood (jointly). When in 1920 only 139,900 ha of land were covered with forest in Estonia, then the number had increased to 235,300 ha by 1940. During the period 1930-1940, the intensity of forestry was increased as well. For this kind of purpose, in 1936 the government enacted the forestry development plan. Usage of forest resources and melioration was in special focus. The state gained profit from selling wood from state forests. Export revenues from wood and wood products formed 30% of all Estonian export (Sein 1999).

Statutory meeting of the first Estonian forest management society was held on April 17, 1929 in Tallinn. This society consisted of forest owners of Harju county. Shortly afterwards, forest societies were also established in other counties. The Association of the Estonian Forest Management Societies was established on March 15, 1930, and it can be considered as the predecessor of the present Estonian Private Forest Union (Eesti Erametsaliit). The purpose of the pre-war private forest association was to consult forest owners, arrange private forests and sell wood. The association also carried out collective buying of plants and seeds.

The Association of Estonian Forest Management Societies had an important role in arrangement of the Estonian wood market and fixing fair prices of wood. Through the forest societies and the association, collective sales of wood were organised. A committee of wood product prices was established with a statute of the Estonian government on July 8, 1938. The committee yearly fixed the minimum prices of wood. If private firms were not ready to pay these fixed prices, state enterprises had to pay the prices if forest owners wanted to sell their wood. The Republic of Estonia also supported forestry co-operation by creating vacancies in forest management societies (Lemming 2003).

One authority managed the state forest and had a control over the management of a few private forests in the Republic of Estonia before the war. Practically the same system was used during the Soviet Union, when the forests of national forest co-operatives (contingently the so-called state forests) were managed, and the supervision over forests of collective farms (kolkhozes) and state agricultural enterprises (sovkhozes) (contingently equalized with private forests) was carried out by the same central authority. Although the central institution of forestry in Estonia has had different titles and has been a part of various

ministries or equivalent government institutions throughout the times, the management of state forests, development of forest policy and legislation related to the forest, supervision over activities in all forests, etc., was left to the competency of the same central institution of forestry. After the perestroika it was necessary to separate the functions of the state as the forest owner and the state as the power and supervision authority. Thereby it was attempted to avoid the unhealthy competition between the state and private forestry, which could have been created by imposing favourable regulations on the state forestry and giving the supervision rights of following these regulations to the state forest managers. The later development of the forestry has proven these dreads invalid: demand exceeds supply in timber market and there is no competition between the timber vendors, at the same time the state forestry maintains its economic advantages nevertheless as a large organization and a vendor of a large volume of timber. However, establishing regulations favourable to the state forestry and constrictive to the private forestry is not possible because unlike the Soviet time, the central authority of forestry is not able to impose restrictions and constraints on the forest owners, this can be done only at the level of the Parliamentary law.

### **Private Forest Management Organizations in Estonia**

The privatisation process started at the beginning of the 1990s in Estonia. At present, 60% of forest land is in private possession. Despite that the co-operation in forestry has not reached the level of the period of 1918-1940. A new period of Estonian forestry co-operation started in 1992, when the Estonian Private Forest Union was established. Nowadays, it unites about 40 local forest management societies from all the counties. Shortly after the establishment of the Estonian Private Forest Union, the importance of forestry co-operation was to be explained. Many forest management societies were formed during the privatisation when the state issued the holdings to forest owners. These holdings were used to buy forestry equipment collectively. At first, the equipment was used collectively but a great part of it was used opportunistically, so not all the members of the societies could use it equally. Therefore, the usage of the collective equipment is not sufficient.

**Estonian Private Forest Foundation (Sihtasutus Erametsakeskus).** The Private Forest Foundation that has gained an important position for the private forest owners has a goal to develop private forestry based on sustainable and environment friendly principles. The foundation also accomplishes other tasks which are stated in the law (Meikar 2004).

The principles of supporting private forestry are set out in the Forestry Development Plan of Estonia to the year 2010. Main activities financed by the Private Forest Centre are:

- supporting private forestry through the organizations forest owners, which is apparently a way to strengthen a joint action;
- supporting private forestry primarily through consulting and forest management planning (forest arrangement and drafting of forest management plans free of charge, whereby a possibility of fast preparation of forest management plans at the expense of the forest owner was anticipated);
- developing the structure of consulting service on the principles of competition; special attention is concentrated on timber marketing. Consulting can also be for charge, ordered and paid by the owner;
- developing tax policy on principles that favour evolving of private forests;
- concentrating on restoration of forest, and following the requirements of environment protection in regards with supervision of private forests. For some reason meeting the cutting requirements has not been a priority and along with leaving the forests un-renewed it is at least as big of a problem.

**Estonian Private Forest Union (Eesti Erametsaliit).** The activities of the EPFU are carried out considering the principles of democracy, sustainable development and environmentally friendly forestry. All the members of the EPFU have the right to participate in EPFU's work. That helps create a structure that works on the principles of collaboration.

The main purpose of the EPFU is to represent the interests of private forest owners. This means active participation in Estonian forest policy and in the legislative process. For creating a strong representative body, it is important to co-operate with forest owners and to let them express their positions clearly. The opinion of the forest owners has to be regarded in the course of such important processes as the

development of the new Forest Act or introducing amendments to the tax regulations. The EPFU can be considered as a mediator in the forest questions between the state and the “third sector” (Introduction 2007).

The EPFU is also engaged in international co-operation. It has established very good relations with similar organizations in the Nordic and Baltic countries as well as in Central Europe.

The EPFU is supporting the activities of its member organisations with implementing various projects. The communication with private forest owners is one of its main tasks. All forest owners joined the EPFU, and its member organizations have the right to acquire special membership card that enables getting certain services by lower price. For the members, the EPFU also organises forestry trips to neighbouring countries.

The EPFU’s highest governing body is a general assembly of its member organisations. The assembly is organised at least twice a year. Each member organisation has one vote in a meeting. Daily work of the EPFU is carried out by the board.

The **Private Forest Management Co-operative** with the objective of representing, protecting and supporting economic interests of its members, and promoting environment-friendly forest management also was operated. The members of the co-operative had the right to receive a part of distributed profit in accordance with the proportion of their part payment. Unfortunately the co-operative went bankrupt in 2006.

### **Importance of Estonian Forest Management Societies**

Due to the fact that most of Estonian forest land is owned by private capital, the necessity for private forest management has arisen. This kind of private forest management that would be beneficial and environment friendly is totally an obligation for the private forest owners. To make such activity possible and easier, the private forest owners have joined special forest management societies. Forest management societies in turn have formed their representation organization – the EPFU. The EPFU represents the Estonian private forest owners and it consists of the local forest management societies: forest co-operatives and forest unions.

Co-operation in forestry operates in two main fields: social co-operation and economic co-operation. The EPFU is mainly responsible for dealing with the first field. Economic co-operation in turn is coordinated by local forest management societies. Economic co-operation in forestry is important and beneficial due to the following reasons. Firstly, co-operation gives the forest owners the possibility to benefit from positive scale effect: selling products together increases product quantities and prices. Secondly, if there were an acting forest management society, there would be no need for intermediary companies because the forest society can function itself as an intermediary between its members and end consumers. Thirdly, the membership in the forest management society increases specific competence of forest owners.

Additionally, economic forestry co-operation helps the forest owners reduce the following forestry management expenses:

- ☐ due to the united management of the forest society, it is possible to reduce administrative expenses (transportation, telecommunication etc.);
- ☐ due to the common interests and needs, it is possible to cooperate in renting or buying technical equipment;
- ☐ it is possible to buy in different united services;
- ☐ it is possible to cooperate in melioration;
- ☐ it is possible to co-operate in order to get different subsidies form the EU.

As stated before in the theoretical part of our article, a co-operative should be formed as a monopolistic trader towards the monopsony middleman. It is important due to the need for developing the countervailing power. Through internalising many transactions into a single co-operative it is possible to economise on transaction costs. Thus, forest management societies together with Estonian Private Forest Union should collectively sell the wood of private forest owners to saw-mills and other wood companies. For that reason, it is important to co-operate in harvesting, transporting and storing wood. Therefore, private forest owners and their co-operatives have to find resources for buying special equipment, building wood storehouses and hiring workers and specialists for serving these tasks.

We also pointed out that if possible, a co-operative should additionally try to overtake the middleman’s functions and bargain directly with the market. In this way, it would be possible to internalise some



middleman's transactions into the co-operative, and lower the transaction costs. In case of forest cooperatives, this means that they should buy or build their own sawmills and develop their trading network in order to sell the wood products to end consumers.

If private forest owners have reached the goal of co-operating in trading with middleman or the market directly, it would also be possible to co-operate in bargaining with downstream partners: i.e., buying seeds and plants collectively etc. Besides direct economic benefits, Estonian Private Forest Union and its member co-operatives can offer its members some other (non-economic) benefits: represent private forest owners' interests on the national and European level, raise forest owners' specific competence, get different subsidies from the EU easier, assure sustainable and environment friendly forestry etc.

At present, the situation of real economic co-operation between Estonian private forest owners and even between forest management societies is not good. The amounts of collective wood selling are marginal, and no co-operative saw-mills or marketing to end consumers exists. In very small amounts, collective buying of seeds and plants is organized in Estonian forest management societies. In our opinion, the situation needs to be changed, but as the solutions we have pointed out in our article require big investments, the decision has to be made by private forest owners and their co-operatives themselves.

### Conclusions

Forests are one of the most important resources of Estonia. In Estonia, forests and rural life have been historically related. In the viewpoint of social development, forestry is important as employment provider. In many rural areas of Estonia, forestry is the main industry that provides vacancies. Also tax revenues from forestry give a great part of budgets of local governments. For rural people, wood is an important resource for energy.

The privatisation process started at the beginning of the 1990s in Estonia. At present, 60% of forest land is in private possession. Nevertheless, co-operation in forestry has not reached the level of the period of 1918-1940.

Due to the fact that most of Estonian forest land is owned by private capital, the necessity for private forest management has arisen. This kind of private forest management that would be beneficial and environment friendly is totally an obligation for the private forest owners. To make such activity possible and easier, private forest owners are joined into special forest management societies. Forest management societies in turn have formed their representation organisation – Estonian Private Forest Union that represents the Estonian private forest owners and consists of local forest management societies.

A co-operative should be formed as a monopolistic trader towards the monopsony middleman. It is important for developing countervailing power and through internalisation of many transactions into a single co-operative for economising on transaction costs. Hence, forest management societies together with Estonian Private Forest Union should collectively sell the wood of private forest owners to saw-mills and other wood companies. If possible, a co-operative should additionally try to overtake the middleman's functions and bargain directly with the market. In the case of forest co-operatives, this means that they should buy or build their own sawmills and develop their trading network in order to sell the wood products to end consumers. If private forest owners have reached the goal of co-operating in trading with middleman or the market directly, it would also be possible to co-operate in bargaining with the downstream partners: i.e., buying seeds and plants collectively etc.

In addition to direct economic benefits, Estonian Private Forest Union and its member co-operatives could offer its members some other (non-economic) benefits: represent private forest owners' interests on the national and European level, raise forest owners' specific competence, get different subsidies from the EU easier, assure sustainable and environment friendly forestry etc..

### References

1. Bargaining Power. Wikipedia. [[http://en.wikipedia.org/wiki/Bargaining\\_power](http://en.wikipedia.org/wiki/Bargaining_power)]. 13.12.2007
2. **Bonus, Holger.** The Cooperative Association as a Business Enterprise: A Study in the Economics of Transactions. – *A Journal of Institutional and Theoretical Economics*, 1986, Vol. 142, pp. 310-339.
3. **Hansmann, Henry.** Ownership of the Firm. – *Journal of Law, Economics and Organization*, 1988, Vol. 4, No. 2, pp. 267-304.

4. **Hansmann, Henry.** The Ownershio of Enterprise. Cambridge: The Belknap Press of Harvard University Press, 1996.
5. Introduction. Eesti Erametsanduse Portaal. [<http://www.eramets.ee/eng/liit/?m=4>]. 10.12.2007.
6. **Lemming, T.** Erametsaomanike ühistegevus kiratseb. Eesti Mets. Nr.2, Veebruar 2003.
7. **Meikar, T.** Ülevaade Eesti erametsanduse arengust aastail 1991-2004. I osa, 2004.
8. **Roos, Andro.** Ühistulise panganduse roll ja arenguvõimalused Balti riikides. TÜ rahanduse ja arvestuse instituut, 2007, 150 lk. (dissertation for MA degree)
9. **Sein, R.** Eesti mets läbi kaheksa aastakümne. Eesti Mets, Nr.1, Jaanuar 1999.
10. **Staatz, John, M.** The structural characteristics of farmer cooperatives and their behavioural consequences, 1987, 57 p. [<http://66.102.9.104/search?q=cache:OITZL8dmZDgJ:www.rurdev.usda.gov/rbs/pub/sr18/strcture.pdf+the+structural+characteristics+of+farmer+cooperati+ves&hl=et&ct=clnk&cd=1&gl>]. 14.12.2007.
11. **Valentinov, Vladislav.** Why are cooperatives important in agriculture? An organizational economics perspective. – Journal of Institutional Economics, 2007, Vol. 3, No. 1, pp. 55-69.

## Resource Use and Entrepreneurship on Dairy Farms in South Ostrobothnia (Finland)

**Seppo Vehkamäki**, Professor, Department of Economics and Management, University of Helsinki

**Matti Ylätaalo**, Professor, Department of Economics and Management, University of Helsinki

**Eetu Aro**, M. Sc., Department of Economics and Management, University of Helsinki

### Abstract

There have been big changes in Finnish agriculture during the EU membership. Values and attitudes towards entrepreneurship have changed as well, especially in labour-intensive livestock farms in Finland. A great part of dairy farms' income are coming from agricultural subsidies which are based on the land area used in production and no longer depends on an entrepreneur's own work input and capital use.

The main goal was to survey the resource use on family-owned dairy farms in South Ostrobothnian area. The data were collected by a postal survey from 191 family farms and agricultural statistics. The factor analysis is used as statistical method.

Studying the resource use of dairy farms by means of the factor analysis four factors were found. The following resource variables have high loadings on factor 1: rented arable land, the number of cows and paid workers. The following variables have high loadings on factor 2: vocational education and the age of an entrepreneur. Variables describing the wage work of an entrepreneur's spouse and high average milk yield of cows determine the factor 3, and variables describing outside income sources loaded on the factor 4.

The results indicate that the agricultural policy and the farm level circumstances have a big influence on the resource use of the South Ostrobothnian dairy farms. Therefore different types of resource use combinations can be found in the studied family dairy farms.

**Key words:** resource use, entrepreneurship, dairy farm, factor analysis, South Ostrobothnia (Finland)

### Introduction

A farm entrepreneur has to constantly adjust his production to a changing operating environment. An especially big change in Finland was experienced with the European Union membership when agriculture became a part of the European Union's common agricultural policy. It meant in the first place a drop in producer prices of agricultural products to the European level, which was compensated by increasing various kinds of subsidies at the same time when price fluctuations of agricultural products increased. The EU membership has led to a decrease in the average income of farmers, although the production level of main products has stayed about the same. On the other hand, it is also possible to find agricultural entrepreneurs who have been able to adjust to the challenges brought on by the new operating environment and who have also reached their income and profitability goals during the EU membership.

The EU eastern enlargement in the beginning of 2006 has forced a remarkable renewal of the agricultural policy (Niemi and Alstedt 2006). Although subsidies coupled to production are being given up, and they are partly compensated with direct income support according to the EU agricultural policy, entrepreneurship is still an important characteristic of agricultural entrepreneurs. They have to think constantly over the productivity of resources and financial goals, enterprise development and continuity of entrepreneurship.

Values and attitudes towards entrepreneurship are changing as well. People are afraid that motivation for entrepreneurship, especially in labour-intensive livestock farms, will decrease, since a great part of agricultural subsidies are based on the land area used in production, and no longer depends on an entrepreneur's own work input and capital use. On the other hand, changes in the operating environment also force an entrepreneur to improve and diversify production operations as well as search for new operational strategies. In these kinds of change situations an agricultural entrepreneur has to estimate his entrepreneurship, his entrepreneurial motivation, the goals of his enterprise and search for a new meaning and grounds for his work.

### **The tasks of the article**

The task of this article is to survey the resource use on family-owned dairy farms in South Ostrobothnia in the context of the entrepreneurship of the farms. The resource categories are cattle stock, arable land and labour. The entrepreneurship is depicted in an ordinal scale of three classes based on the earlier study (Vehkamäki, et al. 2007). The three entrepreneurship classes are 1) farms emphasising entrepreneurship least, 2) farms with average emphasis on entrepreneurship, and 3) farms emphasising entrepreneurship the strongest. The age and experience of a farmer is a very important background variable of this classification in order 1) the first entrepreneurship class – oldest farmers, 2) the middle class – youngest farmers, and 3) the third class – middle-aged farmers. In Finland, South-Ostrobothnia is the region where relatively close-knit communities and small-scale entrepreneurship have centuries-old traditions. In the dairy industry, this tradition goes back to the late 19<sup>th</sup> century. Especially, through the Finnish EU membership the international agribusiness has questioned this tradition in milk production, and great changes are going both in the resource use and the level of attitudes concerning entrepreneurship. Although the study is cross-sectional in regard to the time the farmers' age as a hidden variable in the entrepreneurship classification gives an opportunity to speculate the dynamics of the dairy industry in South Ostrobothnia and its impact on the development of communities. The study is empirical and explorative.

### **Research method**

The factor analysis is used as statistical method (Hair et. 2006). Consequently the study is explorative in nature. Factorisation has been used by the principal component method (Statgraphics 1999, Metsämuuronen 2003, Hair et.al. 2006) from which those axes whose eigenvalue is greater than one have been chosen for further analysis. Based on an interpreted varimax rotated solution, factor points have been calculated for farm-specific variables describing latent behavioural components of resource use. Variable-specific factor loadings of chosen varimax rotated factors, communalities; eigenvalues of factors as well as explained percentages of the analysed factor group's total variance are reported from the results of the factor analysis. The examination of factor scores by entrepreneurship classes is done graphically with the help of Box-Whisker plots (Statgraphics 1999) on which the reporting of the results is mainly based.

### **Data**

The data is based on Aro's (2005) Master thesis. The data were collected by a postal survey from family farms and agricultural statistics. The farms were chosen randomly from the Agricultural Data Processing of Tike's farm registry. The final sample consisted of 380 farms. A questionnaire was used to ask for general background information of farm entrepreneurs, work appreciation, entrepreneurship motivation and a farm's goals. The questionnaire consisted of 100 different questions based mostly on different type of answer alternatives (Table 1). The response rate was about 50% and the final number of farms studied was 191. The answers came from all municipalities in South Ostrobothnia. In the entrepreneurship classes there are 31, 81 and 79 observations. Statistically the sample fills the requirements of the large sample (Statgraphics 1999, Ranta et. al 1997).

### **Results**

The essential characteristics of the resource use variables of the farmers that answered the survey are briefly described in the following. The average age of the farmers was 45.1 years when the survey was done. Younger farmers had a higher education than the older ones. All the farmers under 35 years of age had a vocational education.

The farmers had on average 18 years of experience in independent farming. 15% of the respondents had had the farm in their possession for less than five years and were in a founding phase. 59% of the respondents were in a growth or establishment phase and 25% of them were in a retirement phase. 35% of the farmers did not know a successor, 36% did not know a successor for sure, 31% had a possible successor and 15% knew a successor for sure.

The total arable land area of the farms was 48.65 hectares on average. The farms had 20.76 hectares rented land on average. The average number of cows was 25, giving an average milk production of 7 757 kilos. The small farms had a lower average milk production calculated per cow than the bigger farms.

83% of the farmers had a spouse and 61% of the spouses were working on a farm full-time. On 23% of the farms the spouse had a regular wage-earning job outside the farm. Almost one quarter of the entrepreneurs had secondary occupations. The most common ones were various kinds of contract jobs, e.g., baling and threshing. 15% of the farms had external employees during busy periods or part-time and only 5% (9 farms) had full-time workers. 75% of the farms participated in cattle inspection. Big farms, according to the number of cows, participated more often in cattle inspection than small farms.

76% of the farmers intended to continue production at the present level. 9% were unsure of continuing production and 14% intended to stop milk production in the near future. 9% of the farms intended to change its production line. 8% of the farms intended to increase production considerably.

The factor analysis has been used as analytical method for farms. Studying the resource use of dairy farms by means of the factor analysis four factors were found. The factors were given the following names: 1) Large-scale use of basic resources, 2) Characteristics of the farmer 3) Productivity of cattle, and 4) Part-time farmers. The solution explained 77.7 % of the total variation of the variables (Table 1).

The following resource variables have high loadings on factor 1: rented arable land, number of cows and paid workers. Consequently the following variables have high loadings on factor 2: vocational education and the age of farmer. Variables describing wage work of entrepreneur's spouse and high average milk yield of cows determine the factor 3, and variables describing outside income sources loaded on the factor 4.

The clustering was done by calculating factor points for farms on the basis of varimax rotated factor solutions for the scale of production in terms of main resources, for the characteristics of a farmer, for the productivity of cattle, and for part-time farming.

**Table 1**

**Varimax Rotated Factor Matrix of Resource Use**

Variables	Definition	Factor I	Factor II	Factor III	Factor IV	Communalities
Cattle size	Cows, pc/farm	<b>0.865</b>	0.192	0.180	0.160	0.843
Milk production	Milk, kg/cow and year	0.217	0.339	<b>0.649</b>	0.285	0.665
Age of the farmer	Years	-0.207	<b>-0.814</b>	0.065	0.219	0.758
Vocational education	1 = no formal education 6 = universal education	-0.017	<b>0.901</b>	0.042	0.074	0.820
Secondary occupation	1 = yes ...2 = no	-0.020	-0.094	-0.033	<b>0.934</b>	0.883
Wage work of the farmer's spouse	1 = yes ...2 = no	0.023	-0.193	<b>0.854</b>	-0.186	0.802
Use of external workforce	1 = no ... 5 = fulltime	<b>0.764</b>	0.084	-0.008	-0.140	0.611
Rented arable land	ha	<b>0.882</b>	-0.028	0.068	0.003	0.784
Eigenvalue		2.536	1.479	1.100	1.050	
Explanatory percentage of total variance		31.70	18.49	13.75	13.13	Cum. 77.07

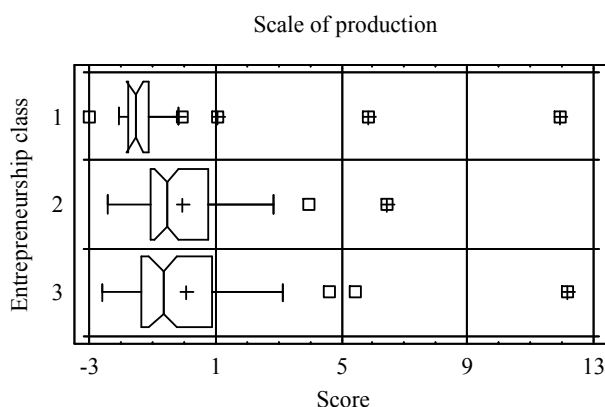
The distributions of farms are illustrated in Figures 1 – 4 with Box-Whisker plots<sup>39</sup>. Figure 1 shows that farmers emphasising entrepreneurship least are using basic resources less in production than in two other entrepreneurship classes.

<sup>39</sup> The Box-and-Whisker Plot option creates a Box-and-Whisker Plot of the data. The data are divided into four equal areas of frequency (quartiles). A box encloses the middle 50 percent, where the median is drawn as a vertical line inside the box. The median notch represents the standard deviation of the median.

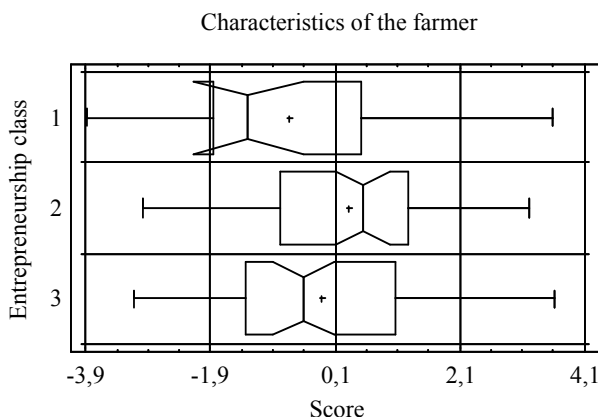
Figure 2 describes the characteristics of the farmers of different entrepreneurship classes. Differences between entrepreneurship classes are quite clear measured by the mean and the median. The youngest and most educated farmers belong to the second class. They consider different alternatives to develop their production in order to achieve their goals. The oldest farmers having least formal education are located in the class 1 as in Figure 1. The farmers belonging to the class of farms emphasising entrepreneurship strongest are in the middle of the entrepreneurship classes 1 and 2.

The productivity of cattle, measured by produced milk per cow, is the highest in the farms with average emphasis on entrepreneurship and lowest in the farms emphasising entrepreneurship least (Figure 3). In the entrepreneurship class 3 cattle productivity is almost at the same level as in the entrepreneurship class 2.

Figure 4 shows that part-time farming is most usual in the farms emphasising entrepreneurship least. This is quite natural, because in this entrepreneurship class the number of cows is smaller than average, the age of the farmers is the oldest and they receive a big part of their income outside agriculture.



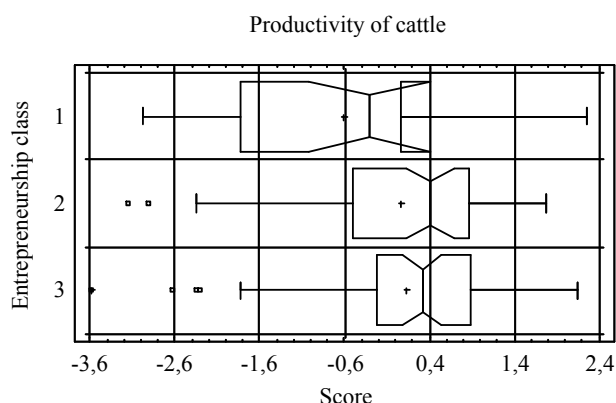
**Figure 1. The distribution of farms by entrepreneurship classes of the factor of the scale of production**



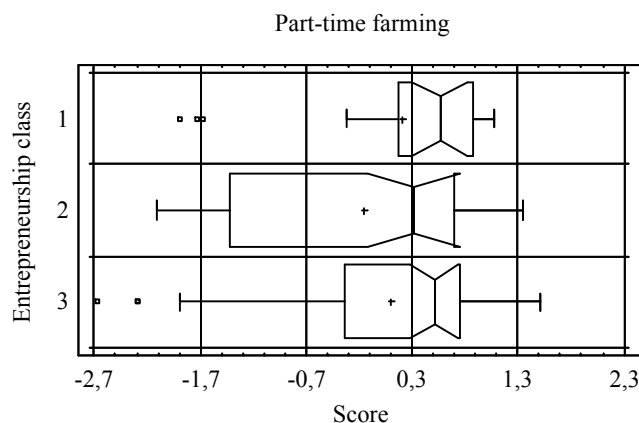
**Figure 2. The distribution of farms by entrepreneurship classes of the factor of**

Horizontal lines, known as whiskers, extend from each end of the box. The left (or lower) whisker is drawn from the lower quartile to the smallest point within 1.5 interquartile ranges from the lower quartile. The other whisker is drawn from the upper quartile. Values that fall beyond the whiskers are plotted as individual points.

### the characteristics of the farmers



**Figure 3. The distribution of farms by entrepreneurship classes on the factor analysis of the productivity of cattle**



**Figure 4. The distribution of farms by entrepreneurship classes of the factor analysis of the part-time farming**

### Discussion

The task of this article was to study the factors that influence a dairy farmers' resource use in the context of entrepreneurship. Methodologically, it is based on the factor analysis the results of which are presented in Table 1.

The results show that the resource use of dairy farmers can be described with four factors. High loadings on factor 1 such as rented arable land, the number of cows and paid workers show that production is based on the large-scale use of farm and labour resources. Vocational education and the age of farmer had high loadings on factor 2. Variables describing wage work of entrepreneur's spouse and high average milk yield of cows determined the factor 3, and variables describing outside income sources loaded on the factor 4. Those variables included in the factors could explain 77.07 % of the total variance between the variables. The factor analysis was, hence, relatively suitable for describing essential factors influencing resource use.

In general, the results indicate that the farms emphasising entrepreneurship very highly are the most professional farms, and their production is based on the large-scale use of farm and labour resources (class 3). The farms belonging to the middle entrepreneurship class have most educated and youngest farmers (class 2). Their attitude toward entrepreneurship is more reserved than their older colleagues although they use resources at least as much as the more established farmers. The dairy farms belonging to the class

emphasising entrepreneurship least are multifunctional small farms that allocate especially their labour for off-farm economic activities (class 1). Probably, they will give up milk production earlier than the other entrepreneurship classes studied, and this is more often because of an entrepreneur's age and productive-financial reasons. The farm would most probably continue its operations as an arable farm. Or if a successor is not known, the land would probably be rented or sold to the neighbours (Vehkamäki and Ylätaalo 2005).

The obtained results concerning the resource use of dairy farms correspond quite well to the results of the earlier studies made in Finland in this area (e.g. Ryhänen et. al. 1999; Timonen 2000). Ryhänen et. al. (1999) noticed in their study that arable land was the most important variable explaining the growth of dairy farms in the municipality of Vieremä, which is located in the northern part of Kuopio province in Central Finland. The longer the farm had been in possession of the same farmer the smaller was the average arable land of this farm. Old farmers do not develop their farm as eagerly as younger ones. Old farmers had 10.4 percent less arable land than those who had owned their farms for less than 10 years. Consequently their results fit well with the results presented in Table 1 and Figures 1 - 4. It means that the farm sizes of the oldest farmers are smallest, and belong to the class emphasising entrepreneurship least.

Timonen noticed in her doctoral thesis (2000) based on the data of 163 bookkeeping farms that on average, the farmers and spouses have same similar entrepreneurial orientation in economic successful farms. Well-educated farmers and farmers of large farms are more entrepreneurial than those with lower education and smaller farms that also fit quite well with the results of this article. Timonen also used the regression analysis in order to explain the economic success of the farm business. The model including arable land, entrepreneurship, forest area, institutional effectiveness and production line explained 39 percent of the variance in the coefficient of profitability. Each variable, while maintaining the other variables as constant explained the following shares of variance: arable land 15.7 percent, entrepreneurship 8.5 percent, forest area 6.3 percent, institutional effectiveness 5.2 percent, and production line 4.2 percent. This shows that besides economic resources entrepreneurship is significant in explaining the profitability of farm business.

## Conclusions

As expected, the results indicate a clear dependence between the resource use and entrepreneurship in dairy farms. Therefore, in the most professional farms the production is based on the large-scale use of farm and labour resources. On the other, the dairy farms belonging to the class emphasising entrepreneurship least are multifunctional farms that especially allocate their labour input for off-farm economic activities. The entrepreneur's age, his/her entrepreneurship class and knowledge of the intergenerational continuity of farming are factors that are in interaction with both resource use and entrepreneurship. However, the conclusions concerning dynamic aspects of dairy farming are very general speculations. Temporarily consecutive surveys are necessary in order to study dynamics more explicitly than what is done in this article.

## References

1. **Aro, E.** 2005. Yrittäjyyteen vaikuttavat tekijät – empiirinen tutkimus Etelä - Pohjanmaan maidontuotantotiloilla. University of Helsinki. Master thesis of Production Economics and Farm Management. Department of Economics and Farm Management. 98 p. + appendixes.
2. **Hair, Joseph F, Black, William C, Babin, Barry J, Anderson Rolp, E, and Tatham, Roland L.** 2006. Multivariate data analysis. New Jersey Prentice Hall. 6th Ed. 899 p. ISBN 0-13-032929-0.
3. **Metsämuuronen, J.** 2003. Tutkimuksen tekemisen perusteet ihmistieteissä. Jyväskylä: 3. painos. International Methelp. 1292 s. ISBN 952-5372-18-9.
4. **Niemi, J. & Ahstedt, J.** 2006. Finnish Agriculture and Rural Industries 2006. Agrifood Research Finland. Economic Research. Publications 106a. Jokioinen: MTT. 96 p.
5. **Ranta, E., Rita, H. and Kouki., J.** 1997. Biometria, tilastotiedettä ekologeille. 3. painos. Helsinki. 569 p.



6. **Ryhänen, M., Sipiläinen, T. and Ylätaalo, M.** 1999. Transfers of arable land and milk quotas on Finnish dairy farms - a farm level analysis taking into account the stages of the life cycle. Ås, 28.juni-1. juli 1999. Jordbruk og samfunn. NJF XXI kongresrapport. Nordisk jord-brugsforskning-nr.3/- årgang 81: 402-411
7. **Statgraphics** 1999. Statgraphics Plus for Windows 4.0. Copyright © 1994 – 1999 by Statistical Graphics Corp.
8. **Timonen, R.** 2000. Yrittävyys, liikkeenjohto ja menestyminen maatilayrityksissä. *Summary: Entrepreneurship, management and success in farm businesses.* Diss. University of Helsinki. Department of Economics and Farm Management. Publications No 28:1-234.
9. **Vehkamäki, S. and Ylätaalo, M.** 2005. Changes in Private Land Tenure in Post-Industrial Finland. In Proceedings of International Scientific Conference in Tartu under the title “Perspectives of the Baltic States’ Agriculture under the CAP Reform” No 221.
10. **Vehkamäki, S., Ylätaalo, M. and Aro E.** 2007. Typologisation of entrepreneurship on dairy farms in South Ostrobothnia. 15 p. Manuscript.

## Problems of Attracting Employees and their Solution at Bread Producing Enterprises

Anastasija Vilciņa, Dr. oec., prof., Faculty of Economics, Latvia University of Agriculture  
Linda Griņēviča, Mg. oec., lect., Faculty of Economics, Latvia University of Agriculture

### Abstract

Maintaining competitiveness and earning profit are topical in the current economic situation for one of the food sectors – bread producing enterprises as their number decreases due to the tough competition, the prices of all types of resources increase sharply, the impact of large bread producers and hypermarkets increase as well as the behaviour of bread consumers' changes. Therefore, it is important to ascertain the role of availability of employees in this complex situation from the points of view of producers and their employees. The paper analyses the topical problems in attracting employees from the point of view of employers; assesses the system for stimulating employees financially at bread producing enterprises of different sizes; stresses the problems regarding employees' satisfaction with their jobs; and the role of relations between managers and personnel in motivating employees. The results of a survey of 50 bread producers – experts, carried out in 2006, and a survey of 145 employees at different size bread producing enterprises, performed in 2007, as well as the data of Latvian Central Statistical Bureau, labour market studies of the Ministry of Welfare of the republic of Latvia, materials of Latvian Bakers Association etc. were used in the paper. This study ends, determining the key directions for improving the attraction of employees at bread producing enterprises.

**Key words:** bread producing enterprises, employees, retaining employees at work, motivation

### Introduction

In 2005 the European Council has formulated several priorities regarding the implementation of employment strategy, among which the following were stressed: retaining employees at work, improving the process of matching interests between employees and enterprises, and increasing investments in human capital, which is a basis for developing professional skills and educating people. It is very important to implement these priorities in the food industry, which is one of the largest processing industries in Latvia, sine 20.8% of the employed in the processing industries were engaged in this industry in 2006. The proportion of value added accounted for 19.2%, the proportion of exports – 24.3%, investments – 18.5% of respective indicators of the processing industries (*Ziņ. par Latvijas ...*, 2007).

Food industry's products satisfy primary human needs, which is a basis for creating and diversifying higher social, cultural and mental needs. The special status of the above mentioned industry was emphasised in the objectives of the Common Agricultural Policy and Sustainable Development Policy of the European Union, one of them – competitive and environmentally friendly agricultural and food production, qualitative and harmless food that generates profit to entrepreneurs.

Being competitive and generating profit are topical issues in the present economic situation for one of the food industry's sectors – bread producing enterprises, the number of which decreases, and their activities diversify due to the increasing competition among bread producers, a sharp price increase of all resources, an increasing impact of large producers and supermarkets, and a change in consumer wishes for bread. Therefore, it is important to ascertain the role of availability of labour force in this complex situation from the points of view of employers and employees.

The **aim of the study** is determining the problems in attracting employees and finding the solutions for these problems at bread producing enterprises.

To achieve the aim, the following **tasks** have been set:

- 1) to characterize topical problems in attracting employees from the point of view of employers at different size bread producing enterprises;
- 2) to analyse assessments of material incentives from the point of view of employees at different size enterprises;

- 3) to determine satisfaction with jobs and the role of relations between personnel and managers in the process of employees motivation;
- 4) to define directions for improving attraction of employees at bread producing enterprises.

The following research methods were used in the study:

- general research methods: logical and constructive, graphical, monographic, analysis and synthesis, inductive and deductive;
- statistical research methods: dynamic array analysis, calculation of statistical indicators, analysis of relationships;
- sociological research methods: document analysis, survey of experts and employees from bread producing enterprises.

The following information sources were used in the paper: studies of leading scientists and researchers, monographs on respective problems (*U.Ivans, S.Ruskule, V.Praude, J.Beļčikovs, I.Ešenvalde, R.Karnīte etc.*), Latvian Central Statistical Bureau data, labour market studies of the Ministry of Welfare of the Republic of Latvia, Latvian Bakers Association data, data of a survey of experts, employees from bread producing enterprises as well as the data of examinations conducted by the Agency of Professional Education, the Ministry of Education and Science of the Republic of Latvia and other materials.

### **1. Topical problems in attracting employees from the point of view of employers-producers at bread producing enterprises of different sizes**

The fact that there is a “lack of employees” stated in the “National Strategic Plan for Latvian Rural Areas Development 2007-2013” of the Ministry of Agriculture of the Republic of Latvia regarding the assessment of the situation in the food industry refers fully to bread producing enterprises. Bakeries and flour confectionery enterprises are important employers as 28% of all food industry’s employees work in this industry. In 1998 bakers and confectioners employed 4933 residents. Their number will change over the next years, go up or down. In 2005, 5268 bakers and confectioners were registered, which is by 7% more than in 1998. According to the structure of industries composition, 71.6% of employees work in the processing industry, 20% are engaged in commerce, 7.3% in hotels and restaurants (*Detal. darbaspēka ...*, 2007).

According to the Professions Survey data of the CSB, the authors’ estimates prove that the ratio of male and female in this profession is 1:4. Irrespective of physically hard, exhausting and monotonous manual work in heat, work in shifts, often in night shifts, too, the proportion of women in these professions tend to increase – in 2000 the female proportion was 80%, in 2005 – 83%. The study carried out by the Ministry of Welfare indicates that 85% of bakers and confectioners are full-time employees. As to part-time employees, the ratio of women and men is 85% and 15% respectively (*Detal. darbaspēka ...*, 2007). According to the Agency of Professional Education, confectioners are educated at 9 educational institutions, but bakers only at 3 schools. 160 confectioners and 27 bakers graduated in 2006, but in 2007 these figures were 145 and 45, respectively.

Considering the above mentioned main relationships between education and employment of confectioners, it is important to ascertain the opinions of leading experts at 50 bread producing enterprises regarding the supply of employees for enterprises<sup>40</sup>. The analysis of the survey results indicate that the most significant factor limiting the development of bakeries irrespective of their sizes is the lack of skilled labour. Experts from micro, medium size and large bakeries regarded the lack of labour as a significant and a very significant factor at the level of 100%, while experts from small enterprises - at the level of 96%.

During 2004-2006, the number of employees decreased in all enterprises of different sizes, however, the largest decrease of employees was observed in small bakeries – 35% of small bakeries’ experts admitted it, but the least decrease was observed in micro enterprises – every fourth expert admitted it. During the same period, the number of employees in small, medium size and large enterprises did not change in 40%-33% cases, but in micro enterprises – in 75% cases. Approximately in 1/3 of small, medium size and large bakeries, the number of employees has increased.

---

<sup>40</sup> survey conducted in 2006 by Latvia University of Agriculture within the framework of the research project “Bread Market in Latvia”

When comparing the assessments of experts of different size enterprises regarding the changes in the number of employees and output during the three year period (Table 1), one can observe a correlation between the decreases in output and number of employees in micro, small and large enterprises in the aspect of proportion. As to the medium size enterprises, the proportion of enterprises in which the output has decreased is larger by 15% than that of the enterprises in which the number of employees has declined. However, the proportion of those medium size and large enterprises which, during the mentioned 3 year period, increased their output partially – in the group of medium size enterprises, but at full extent – in the group of large enterprises, corresponds to the proportion of the mentioned size enterprises in which the number of employees, according to the experts, has increased. As to small enterprises, the situation is different.

**Table 1**

**Changes in the number of employees and output during 2004 – 2006 at bread producing enterprises of different sizes**

<i>Enterprise size</i>	<b>Number of employees (%)</b>			<b>Output (%)</b>		
	<i>decreased</i>	<i>no change</i>	<i>increased</i>	<i>decreased</i>	<i>no change</i>	<i>increased</i>
<b>Micro</b>	25	75	-	25	50	25
<b>Small</b>	35	39	26	35	22	43
<b>Medium</b>	30	40	30	45	20	35
<b>Large</b>	33	33	33	33	33	33

*Source: authors' estimates according to the expert survey results*

The diversity of analysed correlations, to a great extent, can be explained by different possibilities for enterprises to modernise their technology and attract financial resources for enhancing their economic performance. According to the experts, 50% of micro, 30% of small and 10% of medium size enterprises have not purchased new equipment during the 3 year period. The sources of funding and their spectrum are diverse for different size bread producing enterprises. According to the survey data, more diverse sources of funding are used by small and medium size enterprises, which mostly use bank loans – 83% and 85%, respectively. The proportion of medium size enterprises using leasing services is twice as large as that of small enterprises. However, the EU funds were used by the largest proportion of enterprises – 67% were large enterprises, but among small and medium size enterprises this indicator reached 30%.

Bank experts' opinion on receiving the EU funding is quite skeptical, since it is not so simple to receive it for purchasing modern equipments. First of all, it will be necessary to justify the production of a new product. If the product will be brand new at an enterprise, according to an estimate of the working group, the support will not exceed LVL 5000, while bigger support will be allocated for the industry. A period of around half - year will be a hindering factor for receiving a funding, which is necessary for preparing and implementing projects (U.Graudiņš... 2007).

Under the circumstances when the number of bread suppliers decrease due to the tough competition, the price of bread sharply goes up due to an increase in production costs. As a result, the consumption of bread declines. Many bakeries can survive in case of developing an extra business that makes possible to attract new employees or to retain jobs for the present employees. According to the survey of experts, 50% of micro, 78% of small, 45% of medium size and 33% of large bakeries have additional businesses – cafes, public catering, wholesale, farming, car sales, hotel business, real estate business, tourism objects etc.

The experts of bakeries stressed a trend that bakeries, along with a wide assortment of breads, supply various confectionery products as well.

It is proved by the authors' assessment on sales trends for bread and confectionery products during 2000-2005 that bread sales had fallen by 8 thousand tons, while sales of cakes, dough products and other sweetened confectionery products had increased by 6.8 thousand tons, but the sales of sweet biscuits and wafers – by 15.6 thousand tons (Latvijas stat. ... 2006). In reality it means that the activity of bakeries is

completely reoriented towards the production of confectionery goods, or the proportion of cakes, biscuits, and wafers in their output becomes greater.

## 2. Assessment of efficiency of material incentives at bread producing enterprises of different sizes

As the cost of living increases due to the high inflation rate, wages play an important role in attracting employees.

According to the authors' estimate, the average monthly gross wage of bakers and confectioners has increased by LVL 54 during the period of 2002-2005, that of food producers – by LVL 57, while in the national economy it has risen by LVL 82, reaching LVL 144, LVL 151 and LVL 237 respectively at the end of the period (Table 2).

**Table 2**

**Dynamics of average gross monthly wages by professions, the minimum monthly wage and the subsistence level per capita during 2002-2005 (LVL)**

Indicators	2002	2003	2004	2005	2005/2002 (%)
<b>Total</b>	<b>154.82</b>	<b>173.21</b>	<b>207.79</b>	<b>236.81</b>	<b>53</b>
Food producers	93.51	104.45	135.63	150.98	61
incl. bakers and confectioners	90.33	106.67	136.38	144.44	59
Minimum monthly wage	60	70	80	80	33
Subsistence level per capita a month	88.76	93.54	98.78	105.48	18

Source: *Professions Survey Results in Latvia, Central Statistical Bureau data and authors' estimates*

Although the wage increase rate for bakers and confectioners was by 6% higher than that of the national economy, the low wages in this industry, accounting for 61% of the average wage in the national economy, and small differences between the wages of bakers, confectioners and the subsistence wage, ranging between LVL 37 and LVL 39 in 2004 and 2005, do not attract qualified labour to the bread production sector.

According to the survey of 145 employees of different size bakeries, 77% of employees of large bakeries earned an average net wage of less than LVL 150, 23% of respondents earned within a range of LVL 150 – LVL 200. However at medium size bakeries, every fifth employee had a wage from LVL 200 to LVL 300, 10% of employees were paid less than 150 Ls and 32% of respondents could receive a wage from LVL 150 to LVL 200.

This is a reason why there are very different opinions among employees of different size bakeries regarding the wages for their work relative to a result of their contribution.

Only 6% of respondents from large size bakeries believed they were justly compensated for their work, 37% of employees of medium size bakeries and 24% of those of small bakeries agreed to this statement, too. A more detailed analysis of this problem shows that the largest proportion of employees not satisfied with their wage increase opportunities was observed at large bakeries, however, 27% of respondents willing a higher pay work at medium size bakeries. According to the respondents' opinions on a wage increase over the last 6 months, the wages are not adequate, and this situation is not improving. 51% of respondents of medium size bakeries said that their pay had increased over the last six months, but the same percentage of respondents of large bakeries told their wage had not risen over the same period.

The survey allows us to conclude that the system of bonuses and additional payments is not efficient at enterprises. 68% of respondents of large bakeries believe such a system is not good, but every third respondent of medium size bakeries considers it inadequate or partly adequate. In this case it is important to mention that an analysis of gross wages, broken down by their type: regular pay, irregular pay and pay in kind, indicate that in 2006 the proportion of regular wages accounted for 94% in the processing industry. It is by 4.3% more than in the national economy on average. The proportion of irregular wages was 5.8%, which is by 3.8% more than in the national economy on average. During 2002-2006 a trend was observed that the

proportion of regular wages decreases and that of irregular wages increases both in the national economy on the whole and in the processing industry (*Darbaspēka izmaksas... 2007*).

Respondents believe that additional incentives should be used efficiently in order to attract employees for bakeries. Significant additional incentives, according to the employees, are as follows: an opportunity to get a health insurance policy, health improvement at a resort, financial allowances, and additional days off while on leave, and free travel. One can conclude, according to the employees that the mentioned incentives might relate to the employees who have worked for at least one year.

## **2. Satisfaction with jobs and relations between managers and personnel according to the assessments of employees of different size bakeries**

### **3.**

The employees of different size bread producing enterprises are differently satisfied with their jobs. Only 29% of respondents of large enterprises reacted positively, while the employees of medium size enterprises were much more optimistic – 62% of them are satisfied with their work. Partly it can be explained by the different assessments of working conditions – 45% of employees of large enterprises consider their working conditions as good, 48% - partly well. But an assessment of employees from medium size enterprises is better: 58% of them believe their working conditions are good, 39% - partly good. The above mentioned and financial incentives determine the wishes of employees to change jobs – 74% of employees of large enterprises have thought about it as well as 40% of those from medium size and small enterprises did that, too. An inadequate wage is the main factor forcing employees to change their jobs, but this factor is twice as high at large enterprises relative to small and medium size enterprises: an inadequate wage has been the main reason for changing a job for 64% of respondents at large enterprises, while this problem is topical for around 30% of respondents from medium and small size enterprises. The next most serious factors forcing to change jobs, according to the employees, are dissatisfaction with their working time and working conditions – it was emphasised by 38% of respondents of large enterprises and 25% of those of medium size enterprises.

An important precondition for the growth of any enterprise is the training of employees. But, according to the surveyed employees, only 23-24% of employees of medium size and large enterprises believe that an additional training would be required for developing their skills. 67% of respondents of large enterprises and almost half of those of medium size enterprises are convinced that an additional training is not necessary. The difference in opinions on training at different size enterprises can be explained by a greater proportion of older employees' at large enterprises, which already have the necessary know-how and skills, and by a slow pace of introducing modern technologies and few innovations in production. But a surprising fact is that there is a consensus among personnel, employees truly and gladly participate in training new employees – it was assured by 77% of respondents of large enterprises and almost half of those of medium size enterprises.

A great role in attracting employees and reducing labour turnover is played by efficient cooperation between managers and personnel. According to the employees of bakeries, in 40% of cases the attitude of managers towards their staff was just and equal, but about 20% of employees of large enterprises and 10% of medium size enterprises had an opposite opinion. It is a positive fact that almost half of respondents among the employees of large enterprises and around 60% of those among small and medium size enterprises said that their managers paid attention to the working conditions and problems of employees. They believe that communication among employees, team leaders, managers and the director is good when solving different problems. But their knowledge about processes and news are partial, every fourth respondent of medium size and large enterprise believe that he or she is not informed about topical and perspective events taking place at the enterprise. Partly it can be explained by rarely held meetings – more than half of employees of large and medium size enterprises admitted it – and by specifics of their jobs, which hinders holding meetings. However, according to U.Ivans, an expert in management, up-to-date information on events in an organisation, causes and results have a positive effect in many aspects:

- supply of up-to-date information to a staff is highly appreciated, indicating that managers respect their staffs. It causes a feedback effect and staffs respect their directors;
- supply of up-to-date information or even participation of a staff in decision making promote a sense of affiliation to an organisation; employees work harder and a consensus is created in an organisation;

- supply of up-to-date information bars wrong information from less competent sources, satisfies curiosity of employees and hinders creating informal groups;
- no rumours and gossips destroying a social and physiological climate in an organisation are possible in organisations with well supplied up-to-date information (*Vadīšanas pamati.... 2006*).

### Conclusions and recommendations

1. Employers regard the lack of qualified labour force at all types of enterprises as one of the main factors hindering the development of the bread sector.
2. The relationships between changes in the number of employees and output, according to the experts, are different at different size enterprises, which is determined by unequal opportunities for enterprises in attracting financial resources for their successful development.
3. The number of employees at bakeries is retained due to diversifying activities and increasing the share of confectionery products in the assortment of products supplied by bakeries.
4. One of the main factors attracting employees is an adequate wage for bakers and confectioners as present their wages account for about 60% of the average gross monthly wage in the national economy.
5. There are different opinions regarding an increase in wages at different size enterprises over the last 6 months, which, due to increasing inflation rates, boosts labour turnover and causes uncertainty for employees regarding their career plans.
6. In order to reduce the lack of qualified employees, it is necessary to educate more bakers and confectioners at professional educational institutions as about 180-190 graduates of this profession cannot eliminate the lack of labour in the bread industry.
7. It is necessary to encourage employees of all types of enterprises to develop their skills leading to higher competitiveness in the labour market.
8. The factors that strongly impact the attraction and retaining of employees at bread producing enterprises are: the slow pace of introducing modern technologies, the working conditions not matching the wishes of employees – which, according to the survey, are different in different size enterprises.
9. It is advised to use a smart system of bonuses and additional payments in all types of enterprises as the system efficiency is guaranteed in advance by the low wage level.
10. According to the employees, the supply of up-to-date information on topical developments and enterprise future plans has to be improved in all types of enterprises as it engages employees in implementing the common strategy of an enterprise.

### References

1. Darbaspēka izmaksas Latvijā (apsekojuma rezultāti) Datu krājums: LR CSP, Rīga, 2006, jūlijs, 88 lpp.
2. Darbaspēka izmaksas un darba samaksa: Informatīvais apskats, LR CSP, 2007, 19 lpp.
3. Detalizēts darbaspēka un darba tirgus pētījums tautsaimniecības sektoros. LR LM: Rīga, 2007. 224 lpp.
4. Dieziņa S. Izmaksas liek beigt maizes ražošanu. Dienas Bizness, 2007, 2.nov.
5. Ešenvalde I. Darbinieku motivēšana izmaksu samazināšanas apstākļos. Kvalitāte, 2005, Nr.2., 30. – 31. lpp.
6. Galkina I. Maizes tirgū – ar optimismu. Latvijas Avīze, 2007, 15.nov.
7. Galkina I., Viļķina A., Grīnbergs A., Graudiņš U. Īsto maizi meklējiet laukos. Latvijas Avīze, 2007, 22.nov.
8. Graudiņš U. Vai inovācija glābs maiznīcas. LA, 2007, 27.marts
9. IZM finansēto LLU pētniecības projektu (2006., 2007.g.) īstenošanas gaitā veikto aptauju materiāli.
10. IZM PIA npublicētie materiāli

11. Karnīte R. Nesaņemam atbilstošu samaksu, zūd ražīga darba motivācija. Arodbiedrību avīze, 2005, septembris, 4.lpp.
12. Kolosovs D. Maize kļūs par 10 – 15% dārgāka. Diena, 2007, 8.marts
13. Latvijas darba tirgus 2006.gadā (Informatīvs ziņojums) Labklājības ministrija, Darba departaments. Rīga, 2007. 123 lpp.
14. Latvijas lauku attīstības valsts stratēģijas plāns 2007. – 2013. gadam. LR ZM, Rīga, 2006. 89lpp.
15. Latvijas Maiznieku biedrības materiāli
16. Latvijas Nacionālais attīstības plāns 2007. – 2013. LR RAPLM, 2006. 56 lpp.
17. Latvijas statistikas gadagrāmata 2006. LR CSP, Rīga, 2006. 401 lpp.
18. Pētersone K. Par rekordiem un maizes tirgu. Jelgavas Vēstnesis, 2007, 23.aug.
19. Praude V., Beļčikovs J. Menedžments. Rīga: Vaidelote, 2001, 509 lpp.
20. Profesiju apsekojuma rezultāti 2003. gada oktobrī: Statistikas biļetens. Rīga: LR CSP, 2004. aprīlis, 97 lpp.
21. Profesiju apsekojuma rezultāti Latvijā 2002.gada oktobrī: Statistikas biļetens. Rīga: LR CSP, 2003. aprīlis, 115 lpp.
22. Profesiju apsekojuma rezultāti Latvijā 2004.gada oktobrī: Datu krājums. Rīga: LR CSP, 2005, jūlijs, 162 lpp.
23. Profesiju apsekojuma rezultāti Latvijā 2005.gada oktobrī: Datu krājums. Rīga: LR CSP, 2006, jūlijs, 162 lpp.
24. Seržante I. Personāla motivēšana: uz darbinieka ieguldījumu balstīta darba samaksa. Biznesa psiholoģija, 2007, aug.-sept., 10-17 lpp.
25. Tauriņa Ž. Personība uzņēmumā: vai Maslovs un Hercbergs joprojām ietekmē personāla vadību. Biznesa psiholoģija, 2007, aug.-sept., 22. – 25. lpp.
26. Vadīšanas pamati /Sast. Asoc.prof.U.Ivans un doc. S.Ruskule/ Malnava. 2006. 502 lpp.
27. Zālīte I. Cenu kāpumu bremzē konkurence un imports. Diena, 2007, 25.aug.
28. Zālīte I. Ražosim garšīgi! Lietišķā Diena, 2007, 11.jūn.
29. Ziņojums par Latvijas tautsaimniecības attīstību. LR EM, 2007, jūlijs, 148 lpp.



## Evaluation Methods of Natural Resources in Latvia

**Mag.oec. Līga Vindele**, Ph.D. student, Faculty of Economics, Latvia University of Agriculture  
**Dr.oec, professor Veronika Buģina**, Department of Economics, Faculty of Economics, Latvia University of Agriculture

### Abstract

The theme of the scientific article is "Evaluation Methods of Natural Resources in Latvia". Evaluations methods of natural resources furnish information about ways, how to evaluate existing stores of natural resources as well as how to evaluate their output intensity (for example, the quantity of output intensity of drinking water – quantity is divided with the existing stores, acquired results are analysed, and it is defined if acquired intensity is not too fast or it could be possible to increase it).

The aim of the research is to assess the evaluation methods of natural resources in Latvia.

The tasks associated with the aim are: to clarify what hydroichthyological, ecological and organic natural resources are; to assess the methods for evaluation of hydroichthyological, ecological and organic natural resources in Latvia.

In our article we have analysed the evaluation methodology of hydroichthyological, ecological and organic natural resources in Latvia.

**Key words:** Hydroichthyological natural resources, ecological natural resources and organic natural resources

### Introduction

Natural resources are one of the key production resources in national economy. Not only in Latvia but also world wide scientists are studying natural resources, the intensity of extraction of natural resources and their further use in national economy. In order to extract resources and use them in national economy, we need to know what resources in what quantities are available, and whether they are available for use, i.e., whether they are not in the environmental protection areas. In Latvia, these issues are dealt by the government institutions as well as private enterprises.

The methods of evaluation of national resources provide information about the methods of evaluation of the existing natural resources, and determine intensity of extraction, i.e., the intensity for producing drinking water is calculated by dividing produced quantity of drinking water by stored drinking water, the results are analysed, and thus we can determine whether the intensity of production is too high or it can still be increased.

Currently the subject is of a great importance due to the discussions on restrictions on the use of natural resources, and whether the existing natural resources will be sufficient for next generations, and whether it is possible to save the existing natural resources or replace non-renewable natural resources with renewable natural resources.

The object of the research is hydroichthyological, ecological and organic natural resources. The resources have been chosen because they will be analysed in the PhD paper.

*The aim of the scientific article* is to assess the methods for valuation of natural resources in Latvia.

*Tasks of the scientific article* are:

- 1) to create theoretical grounds of the theme – to find out what are hydroichthyological, ecological and organic natural resources;
- 2) to assess the methods for valuation of hydroichthyological, ecological and organic natural resources in Latvia.

The following research methods have been used in the article: abstract logical method, analysis and synthesis, induction and deduction, monographic method and document analysis.

The bibliographic sources are interconnected and based upon each other.

## Results and Discussions

### Hydroichthyological natural resources

**Waters** Mankind is dependent on water and at the same time different kinds of actions leave the impact on water quality.

Water in nature can be found in the form of rain, snow, ice, steam, surface water and ground water, and it is in a permanent rotation. At the same time water has a significant importance on the ecosystem and food supply.

Hydrology is the science about water, its spatial and numeric division in the Earth's atmosphere and under the ground (Hidroloģija).

Hydrology can be classified: Physically Theoretical Hydrology, Usage Hydrology, Ingeneerhydrology, and Regional Hydrology (Hydrologie).

Water on the earth is a permanent movement. Hydrological cycle can be summarized in a simple equation:

$$R = N - I - P, (1)$$

where R – channel, N – precipitation, I – evaporation from sources and flora, and P – changes in water quantity that is stored in the form of snow in the ground and lakes; in the same period of time water equalization time varies daily and yearly. Usually summaries are drawn monthly and yearly. For the period of number of years P cannot be taken into account (Hidroloģija).

The water management can be divided into two big groups: Global and Regional water management (Hydrologie).

In regional water management the waters can be divided into:

- surface waters (all inland waters except ground waters), transition waters and littoral waters but with the regard to the chemical quality – territorial waters as well;
- ground waters (all waters that are under the surface of ground in water saturated zone and are in direct contact with the ground or sedimentary rocks);
- transitional waters (surface waters that are close to river estuaries, and due to close littoral waters are partially salt waters but fresh water stream has great impact on them) (Ūdens apsaimniekošanas likums).

Ecological and chemical quality indicators, such as hydrological, biological, physical and chemical qualities which qualitative or quantitative value has an impact on the water quality, are studied in order to determine water quality.

#### **Surface waters**

Surface water object is a separate and important element of the surface water hydrographic network: watercourse (river, stream, channel or their parts), water body (lake, pond, reservoir or their parts) as well as transitional waters or section of littoral waters (Ūdens apsaimniekošanas likums).

*Lake* is a natural water reservoir in inland cavity (lake cavity) with slow water exchange (Ūdens apsaimniekošanas likums).

All lakes have confluent waters – ground waters, streams or big rivers. The period water stays in the lake depends on the size of tributaries. Water quality depends on the period water stays in lake because it has an impact on dissolving and sedimentation processes as well as biological and chemical processes. Theoretical period of staying or exchange period (T, in years) is the time that is calculated as correlation between the size of lake (V, m<sup>3</sup>) and speed of a stream (Q, m<sup>3</sup>/s):

$$T = V / (Q * (60 * 60 * 24 * 365)) (2) \text{ (Hidroloģija)}$$

Every lake has its own map, where there is a description of depth and surface area which are used in calculating volume of a lake (Unpublished information from Madona regional Environment Office).

*River* is mainly a large stream of water flowing on land surface. It has marked bed and part of the flow can be under the ground (Ūdens apsaimniekošanas likums).

*River basin* is an area of surface (territory), where all surface waters in streams, rivers and lakes flows to the river estuary or delta and flow into the sea (Ūdens apsaimniekošanas likums).

Discharge of river is the volume of water that flows in water way in a certain period of time. The symbol for river discharge is Q. In small rivers it is practical to use amount l/s, whereas m<sup>3</sup>/s is being used in large water ways. In order to compare observations on different rivers, the river discharge is turned into specific discharge and the amount becomes l/(s\*km<sup>2</sup>) or dm<sup>3</sup>/(s\*km<sup>2</sup>). In some cases it is advisable to relate

the river discharge to precipitation and melting snow, and it is measured, for example, as mm/24h that is calculated in a whole river basin (Hidroloģija).

It is time consuming to measure river discharge. Thus the correlation between the water level (W) and river discharge (Q), the so-called discharge curve is used. This curve in natural period usually has general shape and it can be described by an equation:

$$Q = K * (W - W_0) * P, (3)$$

where Q – river discharge, W – water level,  $W_0$  – water level limit value, and K and P – are empirical factors (Hidroloģija).

Table 1 shows the water level and river discharge characteristic conceptions.

Table 1

### Characteristic conceptions of water levels and situations of river discharges

Index	Description
HHW and HHQ	The highest water level (W) and discharge (Q) in a demonstration period
MHW and MHQ	An average index of the highest water level of every year and a discharge during the period
MW and MQ	An average water level and a discharge during the period
MLW and MLQ	An average index of the lowest water level of every year and a discharge
LLW and LLQ	The lowest water level and a discharge during the period

Source: Hidroloģija

### Underground waters

*Underground water object* is a spatially limited part of underground water horizon or underground water horizon complex (Ūdens apsaimniekošanas likums).

*Underground water horizon* is a layer or layers of underground rocks as well as other geological layers with sufficient porosity and water permeability to ensure the return of important water flows or important water volume (Ūdens apsaimniekošanas likums).

Based on the results of hydroecological research, Latvia Agency of Environment, Geology and Meteorology creates a passport of underground water source with the accepted underground water store. Underground water exploitations store is a volume of underground waters that can be extracted in a water body in 25 years using the chosen water extraction scheme, and not creating not allowed changes in the water quality and surrounding environment (Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004).

To determine the optimal water horizon or horizons the following criteria are taken into account:

- depth of the horizon and underground water level;
- quality of underground waters (km, boring-well specific debits);
- natural quality of underground water;
- level of protection of the horizon from surface pollution and emission of underground water pollution signs;
- experience of exploitation of the horizon (risk of boring-well sandiness, depreciation time) (Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004).

To calculate the underground water exploitations stock the following criteria are used:

- required water amount, experience of exploitation of boring-well and forecasted overall power of boring-well;
- forecasted and allowed underground water lowering in the water horizon and boring-wells, and its impact on the environment;
- water quality and possibility of its deterioration in the main water horizon in limits of the protection area of a water body (Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004).

As stated in Latvia Building Standards LBN 222-99 “Water Supply Networks and Buildings”, the source of water supply can be underground waters (water layers and channels), water streams (rivers), water bodies (lakes and water reservoirs); whereas underground waters are the main sources of drinking water supply (Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004).

The following criteria are chosen for water supply sources:

- is water supply sufficient;
- does drinking water meet water quality standards;

- protection of boring-well during the time of its exploitation (Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004).

To calculate the underground water store for particular water boring-well, perspective water source (horizon) has to be chosen and optimal water installation place has to be determined. The criteria to evaluate water sources are as follows:

- supply of the necessary water volume ( $\text{m}^3/\text{dnn}$ );
- water compliance with the drinking water quality standards, constant water quality during the period of exploitation;
- water horizon protection and possibility to form the protective belt around water boring-well;
- ability to use the current water supply infrastructure (Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004).

All the above criteria have impact on the costs of water which is an important precondition in evaluating any water source for water supply (Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004).

Table 2

### Characteristic indexes for the exploration stores of underground waters

Index	Unit of measurement
Effective density of layer, $m_{ef}$	m
Coefficient of filtration, k	$\text{m}/\text{dnn}$
Coefficient of perviousness, $c = k m_{ef}$	$\text{m}^2/\text{dnn}$
Peculiar debit, q	l/s
Resistance coefficient of hydraulic bore – hole, $\xi$	-
Top limit of horizon, $z_a$	m.vjl
Undisturbed level, $\phi_{netr}$	m.vjl
Average hydraulic gradient	-
Active porosity	-
Water horizon	-
Designed debit	$\text{m}^3/\text{dnn}$
Calculated reduction, s	m
Permissible reduction, $S_{max}$	m

Source: Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004

The potential volume of water is determined by a coefficient of water flow through the water horizon and renewing possibility of water resources. When the allowed lowering of underground water level, which is a limiting value to available water resources, is determined, the exploitation of natural resources of underground water horizons is the most appropriate in water supply (Pārskats par hidroloģiskās izpētes darbiem Skrīveros, 2004).

Rational and long lasting use of water resources is necessary to provide long-term protection and supply of good quality water to protect underground waters, the volume of available underground water is calculated in underground boring-wells.

Table 2 provides the summary on the characteristic indexes for the exploration stores of underground waters.

Frequently the information on quality and quantity of underground waters is insufficient as well as the regulations of exploitation and protection of natural resources are not being followed.

*Exploitation of water resources* is the use of surface and underground water resources for the needs of people and national economy (water extraction, storage, preparation for use, supply, and usage, waste water treatment and direction either to surface or underground water bodies), as well as other economic actions, including those of pollution, that can have an essential impact on the quality and quantity in surface and underground waters (Ūdens apsaimniekošanas likums).

*User of water resources* is any natural or legal entity who extracts or uses water for economic purposes (Ūdens apsaimniekošanas likums).

The law “On Water Management” determines that information included into the water usage economic analysis has to be:

- sufficient to calculate costs of necessary actions to be taken, taking into consideration that water user covers all the costs of using water resources as well as taking into consideration calculations on the available water resources and projection of costs for long-term water demand, and projection of necessary investment;
- sufficient to back up the decisions regarding the most cost efficient actions to be taken (Ūdens apsaimniekošanas likums).
- 

### ***Fish***

Fish is valuable, renewable natural resource that determines economic potential of fish farming. Certain species of fish important to industry are being fished in such amounts that prevent renewing and continuing of these species. Therefore the governing body of fish farming has to focus on renewing stock of certain species of fish. Currently fishing management happens once a year based on the changes in fish numbers, not in a long-term, thus fishing and fish industry volume, capacity and technology planning is disrupted (Zivsaimniecības nozares stratēģiskais plāns 2007 – 2013. gadam, 2006).

Industrial fishing remains only near Riga and regions where there are biggest lakes of Latvia. There are 42 species of fish and 3 species of lamprey in Latvia's inland waters. Bream, pike and lamprey are the most fished species in inland waters. The situation related to the resources of inland water fish has deteriorated due to intensive people and economic activities. To improve the situation, several actions are taken to renew spawning areas, increase reproduction of valuable species of fish and protect natural habitat (Zivsaimniecības nozares stratēģiskais plāns 2007 – 2013. gadam, 2006).

Fishing industry is connected with a long term and rational use of resources in Latvian economic area, territorial waters and inland waters, as well as conserving the biological variety. Fishing, fish processing and aqua culture are three main fishing industry branches (Zivsaimniecības nozares stratēģiskais plāns 2007 – 2013. gadam, 2006).

*Fishing* – in Latvia, industrial fishing is allowed in most inland waters – in around 300 lakes, 15 water reservoirs, more than 20 rivers or their sections, whereas lamprey industrial fishing is allowed in 16 rivers. A fall in the number of employment in inland water fishing is observed in places where industrial fishing is banned as well as restrictions exist for the implementation of stock (Zivsaimniecības nozares stratēģiskais plāns 2007 – 2013. gadam, 2006).

*Aqua culture* – Latvia is rich in good layout of inland waters (rivers and lakes) and stable ecologically clean environment, which contributes to the development of aqua culture. The main directions of Latvia's aquaculture are fish growing for market or pre-paid fishing in ponds, and breeding fish for letting them back to their natural environment to reproduce fish resources. The amounts of production in aqua culture are not subject to quotations or any other restrictions, therefore as opposed to fishing, it is an easy business to begin (Zivsaimniecības nozares stratēģiskais plāns 2007 – 2013. gadam, 2006).

The methodology for evaluation of hydroichthyological natural resources gives vast information on the resources we have access to. Yet to interpret this information correctly, specific knowledge is required. Therefore available information is restricted only to a certain circle of people.

## **Ecological natural resource**

### ***Landscapes***

Landscape is people's living environment, resource for tourism development, and basis for rural people's trade diversification. The structure of landscape has an important impact on biological diversity of region, and in many cases the landscape or elements of landscape have a historic value.

*Latvia nature protection policy plan has defined landscape as follows:* landscape is a physiogeographic complex as well as inheritance of historically justified traditions, ethnic qualities, cultural inheritance that has its structure and functions. It has evidence of historic and modern relationship between individual and nature (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

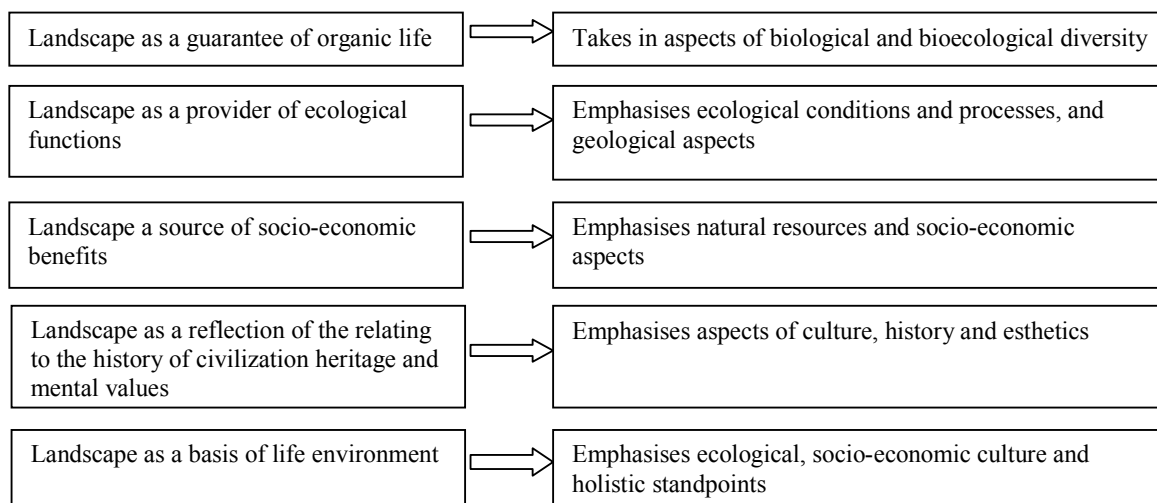
*In European Convention the definition is as follows:* landscape means a territory as it is perceived by people and characteristics of which are the result of natural and/or human activities (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

Richness of landscape determines different aspects of the meaning of landscape. Landscape is:

- carrier of resources and nature aspects, and thus it is a precondition for the development of human activities;

- territorial basis for economic and other activities;
- people's living and working environment;
- source of information (Melluma, A., Leinerts, M., 1992).

It is very important to incorporate landscape protection in the policy of planning towns as well as in cultural, environmental, agricultural, social and economic policies (Ainavu aizsardzība, 2000). Figure 1 shows different ways of landscape perception.



Source: *Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001*

**Figure 1 Ways of landscape perception**

Protection and managing of landscape cannot become an obstacle for the development; on the contrary it has to promote the development: willingness of the locals to work in the territory and tourist interest in it. Therefore landscape management and protection is a complex group of activities, where interests of different groups are taken into account. It has to be based on principles of long-term development to try to relate landscape-controlled development to economic and social changes, which usually cause important changes in the landscape. It is important to recognize landscape development as a continuous process (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

Landscape protection consists of group of different activities:

- overall landscape inspection that gives an idea on landscape development, its values and possible threats;
- decision making about priorities in conserving landscape and its elements;
- designing of landscape plans with specific activities determined (forming of landscapes, looking after, reconstruction etc.) in landscape management;
- integrating landscape conservation interests in territorial plans and building regulations;
- integrating landscape conservation interests in forestry projects and in plans of other industries;
- developing territorial and landscape architectural plans;
- designing plans in case of afforestation of agricultural lands;
- human education in landscape designing and management;
- using different economic mechanisms to increase interest of landowners and land lessees to improve landscape quality (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

#### *Checking of landscapes*

Checking of landscapes is the evaluation and registration of most valuable elements of landscape, rational documentation and factorial analysis to determine the style of further conservation and management. Its aim is to provide scientific information to work out conservation, planning and monitoring strategies (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

The process of landscape checking contains:

- landscape classification – analytic part, where landscape is divided into types or units following different, constant and recognisable signs;

- landscape description – gathering and registration of information;
- landscape evaluation – attaching value to particular landscape, its type or element, depending on specific criteria (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

There is a thorough checking where all the characteristic elements in particular territory are registered, and selective checking where only those elements are documented that have historic or nature conservation importance (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

**Landscape classification:** there are different methods to classify and describe landscapes. One of the most optimal solutions is landscape structural investigation. Landscape structure is the division of landscape elements and qualities in time and space. It usually shows ecological and visual landscape aspects. The main factor in Latvia determining the landscape structure in local and regional scale is geomorphological factor (relief) (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

There are different types of relief: plains, hills and ridge of hills (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

Structures that are formed by relief forms only partly determine landscape characteristics. Landscape surface (using of land) has a big impact (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

Table 3 shows the matrix of typical landscapes in Latvia.

**Table 3**

### Typical Local Landscapes in Latvia

	In utilised agricultural areas	Forest land	Change of agricultural and forest land
Flat country	Flat outside	Flat woodland	Flat landscape
Undulate plain	Undulate outside	Undulate woodland	Undulate landscape
Hilly	Hilly outside	Hilly woodland	Landscape of mosaic hilly

Source: Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001

Taking into consideration the distribution of different landscape types, their uniqueness or importance in conserving variety of landscapes, it is necessary to mention unique landscapes: Lake landscapes, Terraced river valley landscapes; River landscapes; Wetland landscapes, and Marshland Landscapes (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

**Landscape description and mapping:** to describe and explore landscapes it is necessary to mention all factors that are shown in Table 4.

**Table 4**

### Evaluation criteria of landscapes marshes

Physical factors	Human factors	Esthetical factors		Associations	
		Visual	Other feelings	Historical	Cultural
Geology	Archaeology	Proportion	Sound	History of populated area	Well – known famous people
Forms of relief	History of landscape	Scale	Smell	Special events	Literature
Regime of humidity	Way of land using	Seclusion	Taste		Painting
Ground	Buildings and populated area	Coordination	Touch		Music
Vegetation		Colour			
Ecology		Views			

Source: Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001

### Criteria of landscape evaluation:

Representation, characteristics, and traditionalism are the criteria used to determine landscapes characteristics to a certain period of time and local conditions (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

*Diversity* – this criterion characterises biological and geographical diversity of landscape (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

*Rarity and uniqueness* – this criterion determines uniqueness of landscape in terms of physically geographic circumstances, ecosystem, form of land farming and history (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

*Area* – the criterion that describes territorial distribution of particular landscape or its elements (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

*Natural* – this criterion is used to describe the importance of natural elements. There is a view that value of nature elements increases if it is not touched by human economic activities (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

*Age, conservation, distinction* – this criterion is connected with cultural elements in landscape (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

*Written history* – the criterion that describes previous investigations held in the territory, and serve as basis for forming landscape monitoring (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

*Functionality* – the criterion that characterises territorial development of landscape, i.e., what significance landscape has in territorial development. More valuable are those landscapes that serve as a place of residence for people or as resources for tourism and recreation (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

Apart from the mentioned criteria there are other criteria used such as recreational value of landscape, accessibility, distance from urbanization centre, type of management, scientific and educational value, aesthetic value, symbolic value, etc. (Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās, 2001).

### Marsh

*Marsh* is dry land with characteristic constant dampness, specific flora and peat accumulation. Marsh is one of the forms of wetland. As stated in peat extraction classification accepted in Latvia, marshland can be regarded as marsh when peat layer thickness exceeds 0.3 metres. Whereas from biological point of view marsh is a place where flora characteristic to marsh is predominant and such flora can form even when the peat layer is only 5 cm thick. (Purvs)

It is characteristic to marsh that plants needing a lot of water and plants that can adapt to moisture grow there. When the vegetation period is over, the surface part of marsh plants die and it partially decays. Since marsh soil is very moist and there is no active water exchange, i.e., water in marsh is stagnant, oxygen that is in water is being used very quickly and the environment without oxygen is formed.

In such an environment decaying stops and further disintegration happens very slowly (Purvs).

Marsh is an area on the surface with characteristic constant and long lasting dampness, specific flora and peat accumulation (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

There are 2 main ways of marsh forming: dry land bogging-up (usually bogging up happens when water regime of particular place changes); overgrowing of water bodies (due to developing of water plants and accumulation of their remains, water volume in water body decreases. The smaller and shallower is the water body or the slower the water stream, the quicker it grows over (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

Marshes are classified: low or grass marsh, high or moss marshes, and transition marshes (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

*Low marshes* are usually found in river valleys, spring sources, lakesides, mainly in depressions in relief where waters from surroundings accumulate. Different types of sedges as well as flowers grow in low marshes. Thus they are called grass marshes. Grass marshes can be classified into rich grass marshes and poor grass marshes. Grass marshes can be classified according to their location lowlands of grass marshes and grass marshes with springs (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).



*High marshes* – usually have formed from grass and transition marshes. In grass marshes there are rich feeding facilities but due to high moisture, decaying of plant remains is very slow, and therefore peat is accumulated. In high or moss marshes plants are very modest – they have minimal needs for minerals. The most widespread plants and peat forming plants in high marshes are sphagnum of different plants. Common pine is a characteristic species of trees in high marshes or moss marshes. Due to unfavourable growing conditions the pines are only 2-3 m high and have many branches. These pines despite their size can reach the age of 100-300 years (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

*Transition marshes* are the transition stage between grass marshes to moss marsh. In these marshes there are species of flora characteristic both to grass marshes and moss marshes. Sedges and sphagnum moss are characteristic to transition marshes. Also brown moss characteristic to grass marsh is found in transition marsh (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

Marshes cover 4.9% of the territory of Latvia, 70% of marshes is almost untouched. The rest are the marshes where peat is extracted or ditches are dug in order to dry the forest. The biggest high marshes are located in the eastern and central parts of Latvia and in Northern Vidzeme. Some of the biggest marshes are Teiči Marsh (area of 19587 ha), Cena heath (8983 ha), Ķemeri – Smārde heath (6192 ha) (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

Marshes is one of the biggest natural values of Latvia. They contain peat, which can be used as fuel, as litter in animal farming and for many different purposes in agriculture and gardening. We should use peat carefully – although peat accumulates every year (on average 1mm per year) it is not inexhaustible. In many European countries, e.g., Germany and Ireland, there used to be many marshes, but due to inconsiderate marsh exploitation, only very small marsh areas have remained.

Latvia's marshes are home for 50 endangered plant species (43 in low marshes, 15 in high marshes, 27 in others). The biggest number of species is from the orchid family (15 species) and sedge family (10 species). The most valuable marshes are rich grass marshes or calciphilic grass marshes (Znotiņa, V. Purvi).

The cadastral value of marshes is one of main criteria that showing the value of marshes. Marshes according to cadastral value methodology are rural lands.

Cadastral value of rural land is calculated using the following equation:

$$K_v = (P_{LIZ} \times Bv_{LIZ} + P_M \times Bv_M + (0,2 \times P_{p_z} + P_{p_D}^*) \times Bv_{LIZ}^* + b \times C_{maja}) \times K_{apgr} \times K_p \times K_T \quad (4)$$

$K_v$  – cadastral value in lats;  $P_{LIZ}$  – area of agricultural land in hectares;  $Bv_{LIZ}$  – the basic zone value in lats per hectare of agricultural land;  $P_M$  – area of woodland in hectares;  $Bv_M$  – the basic zone value in lats per hectare of wood land;  $P_{p_z}$  – area of the rest of land in hectares;  $P_{p_D}^*$  – area of land under gardens and fish ponds;  $Bv_{LIZ}^*$  – agricultural land III quality group basis value in lats per hectare;  $b$  – symbol of dwelling-house:  $b=1$ , if there is 1 dwelling-house on land;  $b=0$ , if there are no dwelling-houses on land;  $C_{maja}$  – constant of impact of dwelling-house;  $K_{apgr}$  – factor of correction of obstacles;  $K_p$  – factor of correction of pollution;  $K_T$  – factor of correction of market changes (Kadastrālās vērtēšanas noteikumi).

## Organic natural resources

### Peat

Peat is organic rock that has formed of marsh flora. Peat has formed as a result of natural dying of marsh plants and decay process in extreme humidity and insufficient oxygen circumstances. High marsh peat is formed by plants growing in high marshes, mainly different types of moss. Approx. 95% of moss peat volume is a pore. Small pores fill with water but bigger ones – with air, that is why peat provides plant roots with ideal water and air regime (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

The age of peat deposits is 6 – 12 thousand years and 1mm of current peat layer forms in 1 year. Peat is formed in anaerobe circumstances and is sterile. It is acid, with small content of nutritional elements, thus when calcium material is added to peat and composting it with organic manure, it forms the substance of a very high value – humus. (Humus speeds up forming of soil structure, increases water permeability in clay soils and causes beneficial circumstances for root growing) (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

Peat is divided into types, subtypes, and groups depending on the origin of peat and plants that have formed it. *High marsh peat* has formed of plants that have adapted to growing in nutritionally poor environment, and they survive on atmospheric precipitation. The main plant is different moss. Peat that has been formed by moss contains small amount of minerals, and it has got an increased acidity – pH/KCl 2.6–3.2. *Low marsh peat* - deposits of this type of peat are found in relief dents, thus the ground waters, rain and water from lakes and rivers that are full with minerals and calcium flow there. There are good conditions for

the growth of plants, trees and bushes, and peat deposits that are rich in minerals and nutrition values – pH/KCl 4.5–6.5 are formed there.

*Transition marsh peat* - it has formed of the remains of trees, bushes, sedge and sphagnum. Transition peat has a medium content of minerals and it is medium acid – pH/KCl 3.4–4.2 (Nollendorfs, V., Osvalde, A., Paegle, G., 2004).

Table 5 shows the quality indexes of moss peat.

Peat resources in Latvia are not precisely determined but they could be approx. 11.3 billion m<sup>3</sup> or 1.7 billion tons. The majority of these resources are not usable – they are covered by valuable woodlands, they are under agricultural land, and in conservation territories. The biggest peat deposits are concentrated in the eastern and central parts of Latvia. From overall marsh area 49.3% are low marshes, 41.7% - high, 9% the rest marshes. From all marsh areas 69.7% are not touched, 15% are dried and they are used as agricultural land, 8.4% are dried woodlands, 3.9% are used in peat extraction. Approximately one seventh of the marshes are untouched marshes (75 ha) is conservation, and are determined as reserves and restricted areas (Nollendorfs V, Osvalde A. Paegle G., 2004).

**Table 5**

**Quality indexes of moss peat**

Quality indexes	Unit of measurement	Little split moos peat (H1 – H3)	Strong split moos peat (H4 – H6)
Organic substance	weight %	94 – 99	94 – 99
Ashes in dry matter	weight %	1 – 6	1 – 6
Volume weight of moss peat	g/l	50 – 100	120 – 200
Volume of pores	capacity %	94 – 97	88 – 93
Capacity of water	capacity %	52 – 82	74 – 87
Capacity of air	capacity %	15 – 42	6 – 14
Sourness	pH/KCl	2.6 – 3.2	2.6 – 3.2
Concentration of salt	microsiemens	50 – 120	60 – 180
Exchange caption capacity of dry peat	mekv/100g	100 – 150	120 – 170

Source: (Nollendorfs, V., Osvalde, A., Paegle, G., 2004)

Peat extracting has a vital role in the national economy.

To perform ecological and landscape valuation of natural resources, specialists of different fields need to cooperate. Only then the information will be complete, and will be ready to use in further planning processes.

**Conclusions**

1. The methods for evaluation of natural resources provide the information of ways how to evaluate the existing natural resources as well as evaluate the intensity of extraction. The acquired information is the basis for further development of the region.
2. The methods for evaluation of hydroichtyological natural resources provide the information on resources we have. To interpret this information correctly, specific knowledge is required. Quite often the acquired information is incomplete, and laws and regulations regarding the use and protection of natural resources are not observed.
3. To evaluate landscape the basic criteria such as diversity, rarity, uniqueness, area, unaffectedness, age, preservation, and distinction have to be taken into account. Also it is important to acknowledge that landscape protection has to be included into regional and town planning policy, and to remember that landscape forming is a continuous process.
4. One of the most important indicators that show the value of marsh is a cadastral value of marsh. Although we cannot forget about the value of moss, peat value is determined by several quality indicators – organic substance, ash in dry matter, volume and weight of dry peat, volume of pores, etc.

5. Specialists of different fields have to cooperate to perform the evaluation of ecological and organic resources. Only then the acquired information will be complete and can successfully be used in further planning processes.
6. In Latvia the questions about the evaluation of natural resources are dealt by both – the government institutions and private enterprises.

### Proposals

1. To perform the evaluation of underground waters, as very often information is not precise and the evaluation of water stores has been carried out long time ago.
2. To perform fish resources monitoring that will cater to a successful development of fish farming.
3. To perform marsh evaluation that would give precise information on the real value of peat deposits existing in the territory of Latvia.
4. To involve specialists of different fields in the evaluation of resources, thus gaining more precise and complete information, and it will be more widely available to use in agriculture

### References

1. Ainavu aizsardzība. Rīga: Latvijas Republikas Vides aizsardzības un reģionālās attīstības ministrija, 2000., 91 lpp.
2. Ainavu plānošana, apsaimniekošana un aizsardzības lauku pašvaldībās. Rīga: Latvijas Republikas Vides aizsardzības un reģionālās attīstības ministrija, 2001., 18 lpp.
3. Hidroloģija // [tiešsaiste] [skatīts: 2007.gada 10. oktobrī]. Pieejams: // <http://www.ltn.lv/~udenproj/gab/hydrology0.htm>
4. Hydrologie aus Wikipedia, der freien Enzyklopädie // [tiešsaiste] [skatīts: 2007. gada 10. oktobrī]. Pieejams: // <http://de.wikipedia.org/wiki/Hydrologie>
5. Kadastrālās vērtēšanas noteikumi: LR MK 2006.gada 8. novembra noteikumi Nr. 305, Latvijas Vēstnesis Nr. 72, 10.05.2006.
6. Melluma, A., Leinerts, M., Ainava un cilvēks. Rīga: Avots, 1992., 175 lpp.
7. Nollendorfs, V., Osvalde, A., Paegle, G., Kūdras izmantošana bioloģiskajā lauksaimniecībā: Vides Vēstis, Nr. 5/6 (70), 2004. 22-224.lpp.
8. Pārskats par hidroģeoloģiskās izpētes darbiem Skrīveros. Rīga: VentEko vides izpēte un sanācija, 2004. gada novembris, 36 lpp.
9. Purvs // [tiešsaiste] [skatīts: 2007.gada 10. oktobrī]. Pieejams: // <http://lv.wikipedia.org/wiki/Purvs>
10. Ūdens apsaimniekošanas likums: LR likums, Latvijas Vēstnesis Nr. 140, 01.10.2002.
11. Unpublished information from Madona regional Environment Office
12. Zivsaimniecības nozares stratēģiskais plāns 2007. – 2013. gadam. Rīga: Latvijas Republikas Zemkopības ministrija, 2006., 54 lpp.
13. Znotiņa, V., Purvs // [tiešsaiste] [skatīts: 2007.gada 10. oktobrī]. Pieejams: // <http://latvijas.daba.lv/biotopi/purvi.shtml>

### Kopsavilkums

Zinātniskā raksta tēma ir „Dabas resursu novērtēšanas metodes”. Dabas resursi ir vieni no galvenajiem ražošanas resursiem tautsaimniecībā. Lai iegūtu resursus, spētu tos tālāk izmantot tautsaimniecībā, mums ir jāzina kādi resursi ir mūsu rīcībā, cik lielos apmēros tie ir un vai tie ir pieejami izmantošanai (vai neatrodas īpaši aizsargājamās dabas teritorijās). Latvijā ar šiem jautājumiem nodarbojas gan valsts institūcijas, gan arī privātie uzņēmumi. Dabas resursu novērtēšanas metodes sniedz informāciju par paņēmieniem, kā var novērtēt esošos dabas resursu krājumus, kā arī kā izvērtēt iegūšanas intensitāti

Pētījuma mērķis ir izvērtēt dabas resursu novērtēšanas metodes Latvijā. Ap pētījuma mērķi saistītie uzdevumi: Izstrādāt tēmas teorētisko pamatojumu – noskaidrot, kas ir hidroitioloģiskie, ekoloģiskie un

organiskie dabas resursi; Izvērtēt hidroihitoloģisko, ekoloģisko un organisko dabas resursu novērtēšanas metodes Latvijā.

Pētījuma objekts ir hidroihitoloģiskie, ekoloģiskie un organiskie dabas resursi. Šie resursi ir izvēlēti tāpēc, ka tie tiks analizēti promocijas darbā.

Hidroihitoloģisko dabas resursu novērtēšanas metodes sniedz informāciju par mūsu rīcībā esošajiem resursiem, bet, lai šo informāciju spētu pareizi interpretēt ir nepieciešamas specifiskas zināšanas. Iegūtā informācija bieži vien ir nepilnīga, kā arī netiek pildītas daudzas normatīvo aktu prasības attiecībā uz dabas resursu izmantošanu un aizsardzību. Lai novērtētu ainavu ir jāņem vērā ainavu vērtēšanas pamatkritēriji – daudzveidība, retums un unikalitāte, platība, dabiskums, vecums, saglabātība, izcilība u.c., kā arī svarīgi ir apzināties, ka ainavu aizsardzību ir jāintegrē reģionālajā un pilsētu plānošanas politikā, un jāatceras, ka ainavas veidošana ir nepārtraukts process. Viens no svarīgākajiem rādītājiem, kas parāda purva vērtību ir purva kadastrālā vērtība, taču nedrīkst aizmirst par purvos esošajām bagātībām un to vērtību. Piemēram, sūnu kūdra tiek novērtēta pēc vairākiem kvalitātes rādītājiem – Organiskā viela, Pelni sausnē, Sausas kūdras tilpumsvars, Poru tilpums u.c. Lai veiktu ekoloģisko un organisko dabas resursu novērtēšanu, nepieciešams sadarboties vairāku nozaru speciālistiem, tikai tad iegūtā informācija būs pilnīga un veiksmīgi izmantojama tālākam plānošanas procesam.

## **Economic Aspects for the Application of Extruded Rapeseed Oilcake in Poultry Feeding**

**Ira Irena Vītiņa**, Dr. biol., **Vera Krastiņa**, Dr. agr., **Jānis Mičulis**, Dr. biol., leading researchers, **Sallija Ceriņa**, assistant

Research Institute of Biotechnology and Veterinary Medicine "Sigra" of Latvia University of Agriculture, Institūta iela 1, Sigulda, Latvia, LV2150, e-mail: [animal.sigra@lis.lv](mailto:animal.sigra@lis.lv)

### **Abstract**

Economic effectiveness for the application of extruded rapeseed oilcake and cold pressed rapeseed oilcake in poultry feeding for broiler chickens of cross Ross 308 and laying hens of cross Lohmann Brown was evaluated during the experiments.

The extrusion process of rapeseed oilcake increased feed crude protein digestibility by 2.52% for broilers and by 5.02% for layers in comparison with cold pressed rapeseed oilcake.

The increase of extruded rapeseed oilcake protein digestibility is economically profitable in different aspects, like, increased feed protein digestibility and increased poultry productivity, additional income gained from the sales of products, and decreased amount of non digested protein excreted in manure.

The supplement of extruded rapeseed oilcake to broilers ration increased the live weight by 6.92% and income by 9.4% in comparison with cold pressed rapeseed oilcake.

Feeding of extruded rapeseed oilcake to laying hens increased the laying intensity by 2.50%, and thus ensured higher income by 5.60% from the sales of 1000 eggs in comparison with cold pressed rapeseed oilcake.

The amount of non digested protein excreted with manure and these protein losses in cash form an economically significant aspect in extruded rapeseed oilcake feeding out.

By feeding out extruded rapeseed oilcake to broiler chickens the costs of the excreted amount of non digested protein were 9.16% of the costs of in-taken protein, while the amount of losses was by 6.75% smaller in comparison with cold pressed rapeseed oilcake.

The costs of non digested protein to hens in comparison with the costs of the amount of in-taken protein by feeding out extruded rapeseed oilcake were by 5.08% smaller than by feeding cold pressed rapeseed oilcake.

Extruded rapeseed oilcake feeding out to poultry increased income from the sales of products, and decreased the amount of non digested protein excreted in the environment, i.e., less economic losses and less pollution of the environment.

**Key words:** poultry, rapeseed oilcake, costs, protein

### **Introduction**

Rapeseed oilcake has been recently introduced in poultry diet, as it is cheaper locally produced high protein level containing feedstuff (Gilbert R., 2007).

It contains not only high diet protein level for poultry, but also such anti-nutritive compounds as tannine, glucosinolate and others as well (Pastuzewska B., et.al, 2001).

Anti-nutritive substances decreased protein digestibility in gastro – intestinal tract of the poultry, and consequently caused definite economic losses (Vadi M., et. al., 2003).

To improve the economic efficiency of the use of rapeseed oilcake it is extruded at 125°, pressure 10 bar and time 30s, so it increases the price of rapeseed oilcake.

The extrusion process resulted in rapeseed oilcake protein degradability and increased digestible protein level (Leming R., et. al., 2002). The process of extrusion also reduces glucosinolate and tannine in the rapeseed oilcake (Jeroch H., et.al. 1998, Lichovnikova M., et.al, 2004).

There is a possibility that poultry productivity and total income from the sales of production increases by feeding out extruded rapeseed oilcake to poultry, while the excretion of non digested protein with manure decreases.

The aim of our experiments was to investigate the economic efficiency for the application of extruded rapeseed oilcake in poultry feeding in comparison with cold pressed rapeseed oilcake on trial conditions.

### Materials and methods

The experiment was carried out in the vivarium of the Research Institute of Biotechnology and Veterinary Medicine “Sīgra” with broiler chickens of cross Ross 308 of the age of 1 to 42 days and laying hens of cross Lohman Brown of the age of 21 to 40 weeks.

**Table 1**

**The scheme of the experiment**

Group	Feeding programme
Group 1 – test	Basic feed + 5% cold pressed rapeseed oilcake
Group 2 – experiment	Basic feed + 5% extruded rapeseed oilcake

The content of the basic feed for broiler chickens and laying hens has been balanced according to the commercial recommendations of the cross. The daily share of test group poultry contains 5% cold pressed rapeseed oilcake and for experiment group – 5% extruded rapeseed oilcake.

During the trial period the basic indicators for broiler chickens and laying hens were determined regarding their productivity, costs of feed consumption, digestibility coefficients of feed total protein, and costs of total protein content in the poultry manure.

Biochemical analyses of feed digestibility and manure were carried out in the Laboratory of Biochemistry of the Research Institute of Biotechnology and Veterinary Medicine “Sīgra” of Latvia University of Agriculture.

The obtained data were processed statistically in economic aspects by the software MS Excel. The average prices of feed stuff and poultry products on November 1, 2007 in Latvia were taken into account.

### Results and discussion

During the extrusion process (at 125°C, pressure 10 bar, time 30s) the protein content in rapeseed oilcake increased by 4 % on average. The price of one ton of the extruded rapeseed oilcake increased by LVL 20 in comparison with cold pressed rapeseed oilcake price (Table 2).

**Table 2**

**Quality and price of rapeseed oilcake**

Parameters	Cold pressed rapeseed oilcake	Extruded rapeseed oilcake	± to cold pressed rapeseed oilcake
Crude protein in oilcake, average in %	30.0	34.0	+4.0
Price, LVL*: 100 kg oilcake ** 1 kg amount of crude protein oilcake	19.0 0.6333	21.0 0.6176	+2.0 -0.0157

LVL\* – EUR 0.70 \*\* the price of rapeseed oilcake in the Association “Iecavnieks” Ltd in November, 2007

Nevertheless the price of 1 kg protein in extruded rapeseed oilcake is by LVL 0.0157 less than in cold pressed rapeseed oilcake. It is economically more profitable to use extruded rapeseed oilcake in poultry feed composition.

Table 3

**Productivity and digestibility coefficients of feed crude protein to broiler chickens and laying hens**

In basic feed	Broiler chickens		Laying hens	
	Live weight at the age of 42 days, g	Coefficients of digestibility	Laying intensity, %	Coefficients of digestibility
Cold pressed rapeseed oilcake	2761	86.40	91.32	81.25
Extruded rapeseed oilcake	2952	88.92	93.82	86.27
±% to cold pressed rapeseed oilcake	+6.92	+2.52	+2.50	+5.02

The extrusion process of rapeseed oilcake increased the feed crude protein digestibility by 2.52% for broilers and by 5.02% for laying hens in comparison with cold pressed rapeseed oilcake (Table 3).

The increase of extruded rapeseed oilcake protein digestibility is economically profitable in different aspects, like, increased feed protein digestibility and increased poultry productivity, additional income gained from the sales of products, and decreased amount of non digested protein in manure.

The extruded rapeseed oilcake included into the basic feed of poultry increased the live weight by 6.92% to broilers and laying intensity by 2.50% to laying hens (Table 3).

Table 4

**Economic efficiency for the use of extruded rapeseed oilcake in broiler chicken feeding (in trial)**

Parameters	Cold pressed rapeseed oilcake	Extruded rapeseed oilcake	± to cold pressed rapeseed oilcake
Dressing yield of 1000 broiler chickens in trial, kg	1933.0	2066.0	+133.0
Costs price of one kg meat, LVL	1.80	1.80	-
Income from sales of dressing yield, LVL	3479.0	3719.0	+240
Price of feed, LVL -per 1 kg basic feed	0.2370	0.2381	-
-per 1 kg weight gain	11.82	12.28	+0.46
Total expenses for infrastructure and feed consumption per 1000 broiler chickens, LVL	1576	1637	+61
Total income of dressing yield, LVL	1903	2082	+179
% to cold pressed rapeseed oilcake	100	109.4	9.4

The feeding out to broiler chicken feed with extruded rapeseed oilcake supplement dressing yield on the sales of 1000 broilers was by 133 kg or 6.8% higher in comparison with cold pressed rapeseed oilcake

feeding to broiler chickens (Table 4). It ensured by 9.4% higher income on the sales of 1000 broiler chickens dressing yield.

**Table 5**

**Total income for eggs production (in trial)**

Parameters	Cold pressed rapeseed oilcake	Extruded rapeseed oilcake	± to cold pressed rapeseed oilcake
Feed consumption, kg:			
-per 1 kg egg mass	2.25	2.10	-0.15
- per 1000 eggs	130.10	122.80	-7.30
Price of feed, LVL:			
-per 1 kg basic feed	0.2389	0.2399	+0.001
-per 1 kg egg mass	0.54	0.51	-0.03
- per 1000 eggs	31.08	29.45	-1.63
Price:			
per one egg average, LVL	0.08	0.08	-
- income from sales of 1000 eggs, LVL	80.00	80.00	-
Total expenses of infrastructure and feed consumption per 1000 eggs, LVL	41.44	39.27	-2.17
Total income from sales of 1000 eggs: in LVL	38.56	40.72	+2.16
in %	100	105.6	+5.60

The consumption was by 7.30 kg and feed expenses were by LVL 1.63 smaller for the production of 1000 eggs when feeding hens with the extruded rapeseed oilcake supplement in comparison with the use of cold pressed rapeseed oilcakes.

It ensured by 5.60% higher income from the sales of 1000 eggs in comparison with cold pressed rapeseed oilcake (Table 5).

The amount of total protein substances excreted from poultry organism with manure and losses of this protein in cash form an economically significant aspect in extruded and cold pressed rapeseed oilcake feeding out.

Digestibility trial with broiler chickens and hens was carried out, and the costs for the amount of daily excreted protein were calculated per 1000 poultry units.

If 1000 broiler chickens were fed with extruded rapeseed oilcakes supplement, they daily excreted by 2.14 kg less of non digested protein containing substances with manure in comparison with cold pressed rapeseed oilcakes supplement. Correspondingly non digested protein costs were by 6.75% less than by feeding out to broiler chicken cold pressed rapeseed oilcake.

If 1000 hens were fed with extruded rapeseed oilcake supplement, they excreted approx. 3.26 kg of non digested protein containing substances with manure. The costs for lost amount of protein were LVL 4.07 calculated according to the price of feed protein. It composes 13.64% of daily intaken amount of protein and is by 5.08% less than by feeding out cold pressed rapeseed oilcake (Table 6).



Table 6

**Costs of non digested feed protein (excreted with manure)  
for 1000 poultry in day in digestibility trial**

Parameters	Broiler chickens		Laying hens	
	Cold pressed rapeseed oilcake	Extruded rapeseed oilcake	Cold pressed rapeseed oilcake	Extruded rapeseed oilcake
Price of crude protein in basic feed, LVL/kg	1.35	1.36	1.34	1.25
Daily amount of intake total protein with feed, kg	32.37	32.90	22.37	23.87
Cost of daily intaken total protein with feed, LVL	43.69	44.74	29.97	29.83
Daily excreted total protein with manure, kg	5.15	3.01	4.19	3.26
± to cold pressed rapeseed oilcake	-	-2.14	-	-0.93
Cost of daily excreted total non digested protein with manure, LVL	6.95	4.09	5.61	4.07
± to cold pressed rapeseed oilcake	-	-2.88	-	-1.54
Costs of non digested protein amount: % of daily amount of intaken protein	15.91	9.16	18.72	13.64
± to cold pressed rapeseed oilcake	-	-6.75	-	-5.08

### Conclusions

The application of extruded rapeseed oilcake is economically profitable in poultry feeding in comparison with cold pressed rapeseed oilcake and it has resulted in:

- increased live weight of broiler chickens by 6.92%, laying intensity of hens by 2.50%, total income for dressing yield of broiler chickens by 9.4%, and total income from the sales of 1000 eggs by 5.60%;
- costs for the daily excreted amount of non digested protein with manure decreased by 6.59% to broilers and by 5.08% to hens.

### References

1. Gilbert R., 2007. Global feed production on wind of change. *Feed Tech.* volume 11, N°7. 10-13
2. Jeroch H., Brettschneider G., Dänicke S., Halle S., Pikul J., 1998. Influence of rape – seed on hens eggs. *Kraftfutter Feed Magazine*, 2. 46 - 50
3. Leming R., Lember A., 2002. Erinevatel temperaturidel tōdeldud rapsikooki sisaldavate sōtade seeduvus kasvavatel sigadel. *Agraarteadus*, N°6, 331-335

4. Lichovnikova M., Zeman L., 2004. The effects of a higher amount of iodine supplement on the efficiency of laying hens fed extruded rapeseed and eggshell quality. Czech J. Animal Sci., 49 (5), 199-203
5. Pastuzewska B., Zdunczyk Z., Falkowski J., 2001. Rapeseed meal and grain legumes as the main domestic feed protein sources in Poland. Workshop on protein feed for animal production in Central and Eastern Europe – EAAP Technical Series N°1. Rennes, France. 30 June – 1 July 2000, Wageningen. Netherlands, 2001, 125-132.
6. Vadi M., Kalmäl H., Kärt O., Ots M., Jürgenson A., Olt A., 2003. On the effect of processing temperature on rumen degradability of rapeseed cake proteins. Agraarteadus 2, 119-124

## **Kopsavilkums**

### **Ekstrudēto rapša raušu izmantošanas ekonomiskie aspekti putnu ēdināšanā**

Izmēģinājuma apstākļos izvērtēja ekstrudēto rapša raušu izmantošanas ekonomisko efektivitāti krosa Ross 308 broilercāļu un krosa Lohmann Brown dējējvistu ēdināšanā salīdzinājumā ar neapstrādātiem rapša raušiem.

Ekstrūzijas process palielināja rapša rauša esošā proteīna sagremojamību broilercāļu zarnu traktā par 2.52% un dējējvistu zarnu traktā par 5.02% salīdzinot ar neapstrādātiem rapša raušiem. Ekstrudēto rapša rauša proteīna sagremojamības paaugstināšana ir ekonomiski izdevīga dažādos aspektos. Tas ir, paaugstinājās putnu produktivitāte. Tā nodrošināja papildieņēmumus par produkcijas realizāciju, vienlaicīgi samazinājās nesagremotā proteīna daudzuma izdalīšanās no gremošanas trakta ar putnu mēsliem t.i., samazinājās barības proteīna zudumi. Tā broileru dzīvmasa paaugstinājās par 6.92% un ieņēmumi par 1000 broileru kautiznākuma realizāciju par 9.0% salīdzinot ar neapstrādātu rapša raušu izmantošanu.

Dējējvistu dējības intensitāte palielinājās par 2.50% un 1000 olu realizācijas ieņēmumi paaugstinājās par 5.60% salīdzinot ar neapstrādātu rapša raušu izmantošanu. Izēdinot barību ar ekstrudētiem rapša raušiem nesagremotā proteīna ekskretā daudzuma izmaksa broilercāļiem bija samazināta par 6.59% un dējējvistām – par 5.08% salīdzinot ar neapstrādātiem rapša raušiem.

## Seed Market in Poland - Brilliant Future or Stagnation

Ludwik Wicki, PhD econ.

Faculty of Economics, Warsaw University of Life Sciences

### Abstract

The aim of this article is to show the demand change on the Polish seeds market and the presentation of its development prognosis, with consideration of national and foreign breeders participation. The data being used are from the official statistics of the Central Statistical Office as well as the Inspectorate of Plant Health and Seed Inspection, and the Research Centre for Cultivar Testing.

Due to relatively short time ranks, mainly descriptive methods have been used for the assumed average prices of individual species in consecutive years. The value data coming from different periods has been converted to comparable values by the use of a deflator that is the weighted average change of seeds prices. The market value has been defined in constant prices from 2006.

It was developed that Polish agricultural seed market had significant possibilities of increasing, and its value would grow during the next 10 years from EUR 130 million in 2006 to over EUR 200 million in 2015, and even more in the near future. It was also stated that the main share in forecasted market value increase would be consumed by domestic breeders. This rise is forecasted after ten years period of limitation of seed consumption in agriculture. The demand for qualified seeds in 2006 was only half of that observed in 1996. The increase of qualified seeds use in production of cereals and potatoes will be a basic growth factor of the seeds market value in Poland. In sugar beets, rape and maize production only little more seeds may be placed in the market, because of the production area reductions and high common use of commercialised seeds.

The forecasts for the increase depend on technological improvement in agriculture, as we foresee the increase of scale of production. Nowadays Polish farms are strongly fragmented and unable to fully implement the achievements of technical progress.

**Key words:** biological progress, Polish agriculture, use of certified seeds, seed market value

### Introduction

Poland is one of the biggest European countries. The potential of the Polish agriculture is quite huge, though only partially exploited. More economically developed European countries are characterized by a higher productivity of this sector, but the production progress is getting the Polish agriculture closer to the highly productive West European agriculture. One of the most important production growth factors is an introduction of biological progress in the agricultural sector, besides such factors as production scale increase, the modernisation of production techniques or production organization. It is considered that biological progress allows a stable growth of agricultural productivity without a significant augmentation of inputs of other production means; it has also recently so important pro-ecological character (Runowski H. 1997).

The progress reached within the scope of biological production factors in agriculture, i.e., new plant types or improved animal races is big. In Poland, the average harvest in official testing stations has grown twice since 1960, up to more than 8 tons per hectare. Its potential can be exploited effectively only when it is commonly used in production. To do this, the market of progress carrier has to function operationally, this means the whole system of seed reproduction. The influence of biological progress for the growth of agriculture productivity is significant and exceeds actually 50%, it generates profit accounted in hundred millions of dollars per year (Heimlich R. 2003; Lorgeou J. 2004; Ingram J., MacLeod J., McCall M.H. 1997; Woś A. 1995). The researches done for Poland show that due to the low use of qualifiers (Krzymuski J. 2003), and an improper technology (Wicki L., Dudek H., 2005; Krasowicz S. 2007) the production potential of varieties is exploited by only 50%. An additional restriction for the implementation of this kind of innovations is an unfavourable price relation between individual inputs. The changes of relative prices are considered as one of the most important factors for the implementation of innovations in agriculture (Hayami Y., Ruttan V.W. 1969).

In Poland, the agricultural plant breeding is lead by two enterprise groups, eight assembled in the Agricultural Property Agency (APA) and three related to Plant Breeding and Acclimatization Institute

(PBAI). Since several years they have created varieties adapted to the climate and production conditions occurring in Poland. Actually, they are subjected to a more and more strong pressure of foreign cultivators and strive with limitations in the financing of breeding works that result from the arrangements of the EU integration treaty (Wicki L. 2003). The basic source of financing plant breeding works in those companies are license fees, the amount of which depends on the demand for qualified seeds, and participation of national companies in the market.

The aim of this article is to show the demand dynamics on the Polish seeds market and the presentation of a market development forecasts, with consideration of national and foreign subjects' participation. During the elaboration of the forecasts, the permanency of agricultural land has been assumed as well as the foreseen changes in production structure resulting from its quoting have been considered. The tasks of the research are twofold: 1) to analyse the current and future seed supply in Poland depending on crop structure and level of certified seed use, and 2) to analyse the value of seed market in Poland for the next years with the evaluation of domestic breeders share in the market.

The data being used are from the official statistics of the Central Statistical Office (CSO) as well as PIORiN (Inspectorate of Plant Health and Seed Inspection) and COBORU (Research Centre for Cultivar Testing). The following data types have been used: production area, demand for qualified seeds, and share of national and foreign varieties in the market supply.

Due to relatively short time ranks, mainly descriptive methods have been used in the study. The value of data coming from different periods has been converted to comparable values by the use of a deflator that is the weighted average change of seeds prices. The market value has been defined in constant prices from 2006. The information from monographs published in Polish research institutes was used for the forecasts of cultivation area of particulars crops. The graphic method was used for the presentation of results. The hypothesis is that seed market value in Poland will grow at least twice within the next 10 years, and Polish breeders will have the dominant share on the seed market in future.

### Agricultural production in Poland

The area of arable land in Poland covers 12.5 million hectares, while the area of sowing land covers about 11.5 million hectares. Cereals – more than 70% dominate in the sowing structure. Industrial plants: rapeseeds and sugar-beets, and potatoes also have a significant share. This constitute about 11-16 percent of the total surface in the EU-25 countries, with the exclusion of potatoes, of which the production surface in Poland constitutes more than 30% of the general surface in the EU (Table 1).

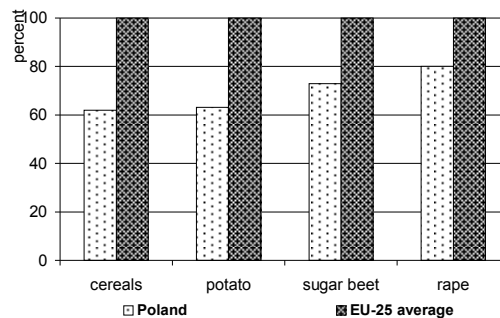
**Table 1**

**The area of basic crops production in Poland (three years average)**

Item	Production area w 000' ha			
	1996-1998	1999-2001	2002-2004	2005-2006
Total: cultivated area	12457	12460	10980	11329
Grains	8767	8618	8279	8358
Of that:				
Winter wheat	1892	1941	1902	1824
Spring wheat	664	675	442	373
Winter barley	148	144	139	150
Spring barley	1022	948	888	1017
Rye	2335	2125	1620	1367
Oat	604	556	551	539
Triticale	654	731	996	1194
Maize for grains	77	160	363	324
Potato	1314	1238	761	593
Sugar beet	424	341	295	274
Rape	355	475	468	587
Share of Poland in the EU-25 total area (avg. in 2002-2006)				
Grains	16.0%			
Sugar Beet	13.2%			
Potato	32.4%			
Rape	11.6%			

Source: the author's calculations based on the CSO and Eurostat statistics

The yields level in Poland is still lower than the EU average. The average yields of cereals equal to 3.0-3.5 t/hectare and potatoes amount to 15 t/hectare. Cereal and potatoes yields reach in Poland only 62% of the EU averages, the rapeseeds yields are slightly better – 80% and sugar-beets - 75% of the EU average (Figure 1). The total cereal production in Poland constitutes about 25 million tons, potatoes 10 million tons, rapeseeds 2 million tons, and beets 12 million tons. Visible differences in productivity can be levelled by the changes in production technology, including the use of modern, high productive plant varieties.

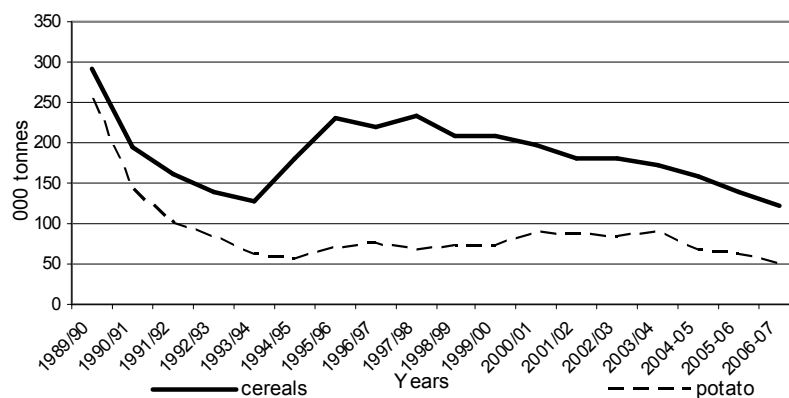


Source: Own calculations based on the EUROSTAT data

**Figure 1. The comparison of the yields level in Poland and the EU-25 (EU-25=100)**

### Seeds demand in Poland

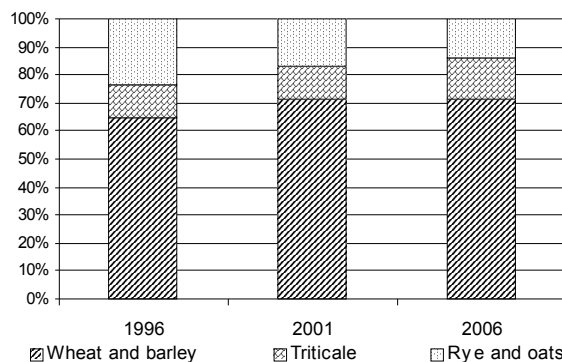
The deliveries of certified seeds in Polish agriculture are shown in Figure 2. Directly after the change in the political system, a significant decrease in the use could be observed resulting from the adaptation of agriculture to new market conditions and price relations. In this period many enterprises working on seeds reproduction collapsed and the prices of production means increased in relation to agricultural product prices. Within the years 1993–1997, a slow growth of the use of qualified seeds has occurred due to the prosperity in agriculture. Since the Russian crisis and export restrictions of agricultural products onto this market we observe a steady decrease of qualified seeds use. In the season 2006/2007 only 120 thousand tons of certified cereal seed were sold, whereas in 1996 it was almost 250 thousand tons. The integration into the EU and full community market opening for Polish agricultural products did not improve the prosperity on the seeds market.



Source: CSO statistics

**Figure 2. Certified seed supply in Poland**

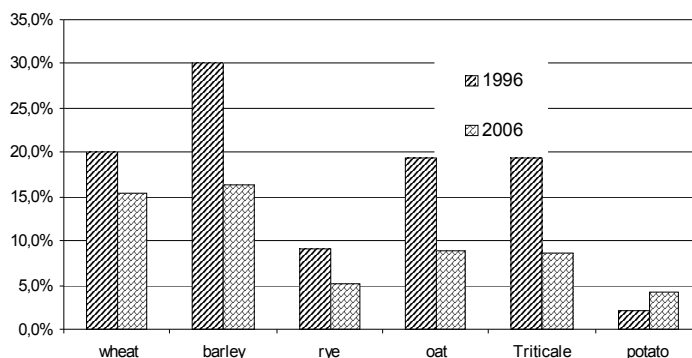
Intensively produced species, i.e., wheat and barley, which participation in sales exceeds 70%, although their production surface equals to 40% of the cereal production area in Poland dominate within the sales structure of qualified seeds (Figure 3). In case of low intensive species it is not profitable to use qualified materials, as additional costs do not allow reaching additional income (Wicki L 2007).



Source: Own calculations based on the Central Statistical Office statistics

**Figure 3. The structure of certified cereals seed supply (divided into groups of different intensity of cultivation)**

The decreasing delivery level causes constant decline in the participation of qualified seeds in the total sales, and hardly constitutes 15 percent for wheat and barley, and 5–8 percent for other cereal species. The use of high quality, qualified seed potatoes does not exceed 4 percent (Figure 4). In corn and sugar-beets production, practically the total sowing materials come from the purchase, because only hybrid varieties are found.



Source: Own calculations

**Figure 4. The share of certified seed in the total use of seed in Polish agriculture in 1996 and 2006**

#### The value of seeds market and its changes

The use of cereal sowing material in Poland comes to about 1.5 million tons, while the sales of certified seeds reach the level of hardly 125 thousand tons. The estimated value of used seeds in prices of the trade material amounts to PLN 800 million (EUR 175 million), and in qualified material prices PLN 1800 million (EUR 380 million). This means that there exists an important market development potential. The sales of sugar-beets, corn or rapeseeds cover almost totally the demand for sowing material and the changes in sales are rather related to the changes in production surface. Table 2 shows the seeds deliveries since 1996 and the estimated market demand till 2025. A significant demand growth for qualified cereal seed has been foreseen, especially after 2010, which results from the progressive production concentration and improvement of production technologies, and following that it comes to a demand growth for production means (including qualified seeds) (Gołębiewska B. 2007). A significantly lower growth, if not stagnation, is foreseen with regard to sugar-beets and corn, since today only the purchased seeds are used; furthermore a limitation of production surface of sugar-beets and the stabilization of corn cultivation area has been foreseen. The Polish seeds market will be generating growing important profits. Even today a big amount goes to foreign cultivators, mainly from the EU countries. The participation of foreign varieties in the variety register in Poland has been differentiated. The participation of foreign cereal varieties in the register in 1996

amounted to 9%, and in sales 6%. In 2004 there have been 27% of varieties and about 20% of sales. Foreign breeders are the owners of 80% of offered rapes varieties, 70% sugar-beets varieties and 77% corn varieties.

Table 2

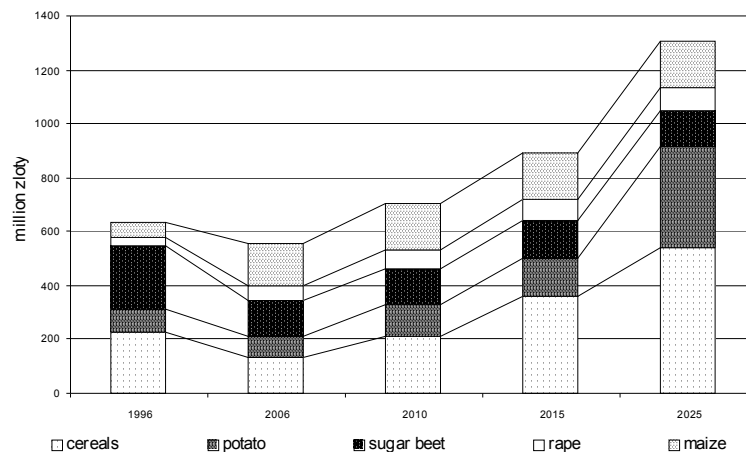
**Certified seed supply in the period of 1996-2006 and forecasts for 2015**

Species	Supply of certified seeds in 000' tonnes in years				
	1996	2006	2010	2015	2025
Cereals:	231.5	136.1	218.6	363.6	632.2
Winter wheat	69.9	50.2	71.9	143.7	215.6
Spring wheat	29.1	17.2	22.8	30.4	45.5
Winter barley	10.2	4.2	5.8	7.0	14.0
Spring barley	40.9	25.5	47.9	63.9	95.9
Rye	32.8	10.1	19.8	39.5	79.1
Oat	21.8	8.5	14.6	19.4	38.8
Triticale	26.8	20.4	35.8	59.7	143.3
Potato	69.1	61.3	104.5	149.3	447.9
Sugar beet	588.4	340.7	340.7	340.7	340.7
Rape	1.2	1.7	2.8	3.0	3.4
Maize	322.4	1050.6	1104.8	1139.6	1139.6

Source: CSO statistics and own calculations

The presented market shares mean that the most profitable market segments have been dominated by foreign cultivators.

The market value, according to the presented forecasts will grow, mainly due to of an increasing cereal seeds sales. The income of seeds companies and breeders will probably grow by about 60% till 2015 and in a long-term perspective will be more than twice as high as observed today. The value of the agricultural seeds (without vegetable seeds) market in Poland can be actually estimated at about PLN 600 million (EUR 130 million), in 2015 this value can be about PLN 1.0 billion and more than PLN 1.5 billion in 2025 (Figure 5). The increase of the market value by 2015 will be reached due to increased sales of cereal seeds and potatoes sets, by 170% and 100% respectively. In other species a significant supply increase will not be observed, as already now the total or most of the sowing material is a specially prepared qualified sowing material, mainly mixed varieties (hybrids). Additionally we cannot expect an increase of production area of sugar-beets and corn, because of a restricted sugar and milk production. Also the surface of potatoes production will decrease; it will though be compensated by the higher level of certified seed use.



Source: Own calculations

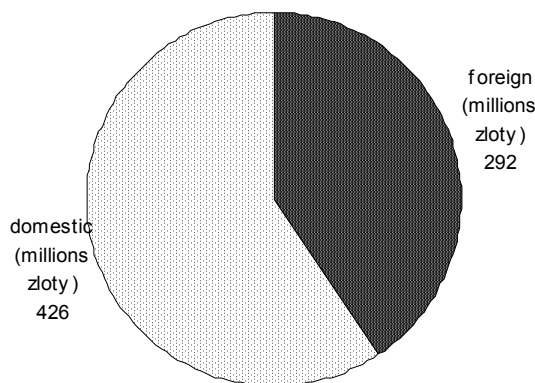
**Figure 5. Seed market value in Poland (on the basis of 2006 structure of cultivation and prices)**

The basic factor determining the market value growth will be the increase of production intensity and production concentration in farms having the highest production scale and share of market placed

production (Gołębiewska B. 2007). The processors require the delivery of products of given cereal varieties or potatoes suitable for a given production technology applied by them.

The prices of sowing materials will not change in a real perspective, and their changes will rather not influence the seeds market value. They reach actually the level of 200-300% of the grain price sold from farms and their further increase would cause a restriction for the demand (Runowski H. 1997).

The increase of the seeds demand will bring benefits mainly for Polish breeders, in so far as they keep the actual market shares. This result from the fact that Polish varieties have the highest share in the sales structure of cereals and potatoes, and this market segment is dynamically growing. The increase of market value in the segment dominated by foreign cultivators will amount to 16%, and the segment dominated by national cultivators will grow from PLN 320 million in 2006 to PLN 430 million in 2010 that means by 32%.



Source: own forecasts

**Figure 6. Seed market value in Poland in 2010 and the market shares of Polish and foreign origin varieties**

Basing on the observed market shares in 2006 and foreseen market increase, it can be forecasted how the market will be divided to Polish and foreign breeders in the coming years. About 40% of income will fall to foreign cultivators (Figure 6). The reduction of the Polish breeders' position, related to the cessation of plant raising subsidisation (Wicki L. 2003) in Poland can lead later on to an offer limitation of national varieties and increase of importance of foreign varieties on the Polish market.

### Conclusions

Basing on the deliberations above, the following conclusions can be presented:

- 1) The potential of the Polish agriculture is not being fully exploited at present. The production of cereals can grow even by 30%, as far as the production scale raises and technology is developed.
- 2) The implementation of biological progress in a developed agriculture is a basic factor for the productivity growth. In Poland, this factor is still poorly exploited due to an moderately low production technology level and a low share of market placed production, as well as a low profitability of certified seeds use.
- 3) With the development of agricultural production and an increase of its concentration, and increased level of market placed production, the use of certified sowing material will increase. Within a period of 10 years, the sales volume can grow hardly twice and reach the value of PLN 1 billion (EUR 220 million) in 2015, and even PLN 1.5 billion after 2020.
- 4) The increase of high quality seeds use within a general improvement of production technology is an essential condition in Poland to reach a harvest grow up to 4 t/hectares and assure a self-sufficiency in cereal production.
- 5) The increase of qualified seeds use in the production of cereals and potatoes will be a basic growth factor of the seeds market value in Poland.



- 6) At present and in the future foreign varieties will dominate in seeds sale of such species as sugar-beets and rapeseeds (more than 50%), corn (77%), and barley (about 50%). Significantly less it counts for potatoes (about 30%) and other cereal varieties (from 0 to 10%).
- 7) Polish cultivators will be the main beneficiaries of the seeds market growth and will control it by 50–60%, as far as they do not subject to the pressure of foreign companies.

### **References**

1. Gołębiewska B. (2007) Changes of agricultural activity of individual farms in Poland. *Agrární Perspektivy XVI. Evropské trendy v rozvoji zemědělství a venkova. Vol. II, Ceska Zemedelska Univerzita w Praze, Praha 2007. Pp.652*
2. Hayami Y., Ruttan V.W. (1969) Factor prices and technical change in agricultural development: The United States and Japan 1890-1960. Staff Paper P69-19. University of Minnesota. 1969.
3. Heimlich R. (2003) Agricultural Resources and Environmental Indicators. Agriculture Handbook No. 722, USDA February 2003.
4. Ingram J., MacLeod J., McCall M.H. (1997) The contribution of varieties to the optimisation of cereal production in the UK. *Aspects of Biology* nr 50, 1997.
5. Krasowicz S. (2007) *Możliwości zwiększenia produkcji zbóż w Polsce. [in:] Czy Polsce grozi kryzys zbożowy. Wydawnictwo Wieś Jutra, Warszawa 2007.*
6. Krzymuski J. (red) (2003) *Historia hodowli i nasiennictwa na ziemiach polskich w XX wieku. Rośliny rolnicze. Wydawnictwo Prodrak, Poznań 2003. pp. 80-82.*
7. Lorgeou J. (2004) Ocena odmian kukurydzy w systemie doświadczalnictwa porejestrowego we Francji. *Hodowla Roślin i Nasiennictwo* nr 3, 2004.
8. Runowski H. (1997) *Postęp biologiczny w rolnictwie. Wydawnictwo Fundacja Rozwój SGGW, Warszawa 1997.*
9. Wicki L. (2003) Finansowanie postępu biologicznego w produkcji roślinnej. *Roczniki Naukowe SERiA*, t.V, z.1, 2003.
10. Wicki L., Dudek H., (2005) Wpływ podstawowych nakładów plonotwórczych na poziom i wartość produkcji w gospodarstwach rolniczych. *Roczniki Nauk Rolniczych Seria G*, t.92, z.1. 30-41, 2005.
11. Wicki L. (2007) Wpływ postępu biologicznego na plonowanie i ekonomikę produkcji zbóż ozimych. *Roczniki Nauk Rolniczych SERiA G*, t.94, z. 1, 2007.
12. Woś A. (1995) *Ekonomika odnawialnych zasobów naturalnych. Wydawnictwo Naukowe PWN, Warszawa 1995.*

#### **Ludwik Wicki**

Department of Enterprise Economics  
Faculty of Economics, Warsaw University of Life Sciences  
ul. Nowoursynowska 166, 02-787 Warszawa, Poland  
Phone (+4822) 5934238  
Fax: (+4822) 5932930  
E-mail: ludwik\_wicki@sggw.pl

## **Methods of Professional Activation for the Unemployed in Agricultural Areas within the Project of the Community Initiative EQUAL (Part 1)**

Dr. eng. **Malgorzata Zajdel**  
Department of Management  
Management Information System Department  
University of Technology and Life Sciences in Bydgoszcz

### **Abstract**

The article presents a description of the project implemented in Poland after entering the European Union as a part of the PIW EQUAL financed from the European Social Fund. PIW EQUAL has to respond to the local and regional needs. The aim of the EQUAL Initiative is the promotion of new methods of eliminating any forms of discrimination and inequality in the access to the labour market. The participation in the project enabled the activation of people being unemployed for a long time. Several partners have participated in the project. The main aim of the project was economic, social and professional individualisation of people endangered by marginalisation.

**Key words:** unemployed, information technology, the Internet, raising qualifications

### **Introduction**

For many years the European Union has founded numerous programmes and initiatives supporting projects for people suffering from exclusion and discrimination; one of actions undertaken in this area is the Community Initiative EQUAL. It constitutes a part of the European Employment Strategy for providing a higher number of work pieces and ensuring a broad access to them. The Initiative has been implemented since 2001, and in 2004 the second round of EQUAL started in all 25 Member States of the European Union. Financial allocation for EQUAL in Poland for the period of 2004-2006 amounts to EUR 133.92 million from the European Social Fund and EUR 44.64 millions from the national budget. The Department for the European Social Funds Implementation at the Ministry of Economy and Labour was responsible for preparing the Single Programming Document for EQUAL. The European Commission with the approval of the European Parliament, Member States and social partners established nine priority themes, however, in Poland only five of them were implemented.

Theme A - Facilitating access and return to the labour market for those who have difficulty in being integrated or reintegrated into a labour market, which must be open to all.

Theme D - Strengthening the social economy (the third sector), in particular the services of interest to *the community, with a focus on improving the quality of jobs.*

Theme F - Supporting the adaptability of firms and employees to structural economic change and the use of information technology and other new technologies.

Theme G - Reconciliation of family and professional life, as well as the reintegration of men and women who left the labour market, by developing more flexible and effective forms of work organization and support services.

Theme I - Supporting the social and vocational integration of Asylum-Seekers.

EQUAL Programme must correspond to local and regional needs. The Initiative aim is to promote new methods for countering all forms of discrimination and inequality in access to the labour market. Therefore the Community Initiative EQUAL is a research tool testing an innovative attitude to the problem, and - as a result - enabling to discover and implement new system solutions.

The heart of actions is the development of new methods, tools, and ways, what is done with an active participation of the Project Final Beneficiaries as well as Partners.

An interest in the Community Initiative EQUAL in Poland was lively. According to the data gathered by the Coordination Fund, which performs the role of the National Support Structure approving applications,

751 applications of the total value of almost PLN 5 billion were submitted, and 107 of them were admitted to be implemented.

### **Aim, method and organization of the research**

The aim of the article is to carry out an analysis, and to provide a description of the project implemented within the Community Initiative EQUAL framework.

The project was implemented in Kujawsko-Pomorskie province, where the unemployment rate is 22.5%.

As the predicted results, which were to confirm gaining independence by 80-per cent-group of the project participants, had been achieved, the project was regarded as fully implemented. Moreover, it was nominated as the Best Human Investment by the Ministry of Regional Development.

### **Research methods**

The article is based on the application of the case-study method. Considering the descriptive character of the project, the scientific methods which allow carrying out the research with the project participants are listed in the article. A wide range of the project actions allows applying only a partial presentation of the problem.

### **Objective of the Project "Stand Up, Raise Your Head"**

In November 2004 Pomorsko Kujawskie Civic Mutual-Aid Association in Barcin, a non-governmental organization, succeeded in the competition of the Community Initiative EQUAL submitting a project in one of four thematic fields: Facilitating access and return to the labour market for those who have difficulty in being integrated or re-integrated into the labour market which must be open to all (theme A). The Project consisted of three Actions, assumed work with a group of 35 inhabitants of the Barcin commune –the unemployed for a long time and being at risk of social exclusion.

Implementing Action 1 till the end of the first half of 2005 the Association was obliged to set up Development Partnership on a national level, and then to formalize it signing agreements with University of Technology and Agriculture in Bydgoszcz, Bydgoszcz In-Service Training Centre and Powiat Labour Office in Żnin.

The bilateral agreement of the Project Administrator - Pomorsko Kujawskie Civic Mutual-Aid Association in Barcin and its Partners was signed on 16 June 2005 in Lubostroń. On 11 January 2006 the Association signed an agreement for co-funding Action 2. It means that Managing Authority for the Community Initiative EQUAL (Ministry of Economy and Labour) accepted the settlement of resources provided for Action 1 and its effects in the form of national and transnational partnership agreements supplemented by a detailed programme, a budget and a strategy for Action 2.

The main objective of the Project "Stand Up, Raise Your Head" is restoring independence in an economic, social and professional sense to the people at risk from marginalization. Moreover, three detailed objectives were distinguished:

Objective 1: to improve psychical condition of participants;

Objective 2: retain to the labour market for those who suffer from inequality on account of lack of qualifications and low level of education;

Objective 3: to ensure Beneficiaries' participation in the development of information society thanks to acquiring computer and Internet skills.

The Project participants are the unemployed who have been out of work for more than three years and who are inhabitants of Barcin commune, which has the population of about 15.5 thousand. In the group of 36 participants, there are 58.3% of women (21) and 41.7% of men (15). As regards the education level, 66.7% of participants have a vocational education, 30.5% attended only primary school and 2.5% graduated from a secondary school. The average age of participants is 34. The recruitment was carried out by the Social Welfare Centre in Barcin on the basis of its employees' knowledge and qualifying questionnaires analysis.

### **The role of partners and the project tasks implementation**

Since July 2005 the Development Partnership has implemented tasks fore-seen by the programme of Action 2. Partners started the implementation of tasks from designing programmes and employing trainers, and then the meetings of 36 selected Final Beneficiaries - the Project participants - started.

Pomorsko Kujawskie Civic Mutual Aid Association as a leading Partner and the Project Administrator according to the Development Agreement implemented the following content-related tasks:

- recruitment of participants and a control group, and then examination of participants psychical conditions which was carried out four times;

- workshops reinforcing participants' psychical conditions;

- individual work of group guides with participants;

- appointing Supporting Groups and Eagles' Nests;

- workshops supporting active search of a job;

- preparing assessment of vocational preferences after examining participants' vocational predispositions;

- setting up the Unemployed Activation Centre consisting of Labour Alert and Hatchery of Initiatives.

The Unemployed Activation Centre provides participants with the opportunity to test already acquired knowledge and skills in practical and unassisted functioning on the labour market.

Powiat Labour Office in Żnin as Partner No 1, according to the Development Agreement "Stand Up, Raise Your Head", carried out a local labour market analysis concerning vanishing jobs and jobs of the future, taking into consideration the structure of unemployment in the area of Żnin county and the trends occurring in this structure. In order to determine vocational courses for the Project participants, it was necessary to examine participants' professional predispositions, which was done by a professional adviser. Individual Actions Plans - plans of professional development were prepared for each of Final Beneficiaries. In addition, Labour Office implemented the task "Your Job Adviser" which aim was to provide Beneficiaries with available job offers and with information on the labour market services. From February to October 2006, all Beneficiaries took part in an obligatory course of English on the basic communication level.

The Department of Computer Science in Management, Faculty of Agriculture in University of Technology and Agriculture in Bydgoszcz as Partner No 2, having a broad experience and an appropriate didactic base, started to implement tasks with the aim to ensure Beneficiaries' participation in the development of information society through acquiring computer and Internet skills. From 1 September 2005 to 31 December 2005, the task named "Friendly Training Programme" was implemented. Within its framework, two concepts were developed - "Friendly Training Programme" and "Project of Module of the Electronic Base of Knowledge" allowing the training effectiveness verification; the software of the base was provided as well. 36 training units constituting course materials for Beneficiaries were also designed. On 9 January 2006 participants started to attend computer skills courses, working in three groups with individual workstations and in the charge of two trainers. In each of laboratories there were 13 computer stations with access to the Internet; twelve stations for participants and one station for two trainers. Participants were provided with elevenses and lunch. The training staff consisted of experienced employees from the Department of Computer Science in Management. In April 2006 one of participants gave up and since that time there were 35 participants.

Bydgoszcz In-Service Training Centre as Partner No 3, according to the Development Agreement "Stand Up, Raise Your Head" was responsible for designing and carrying out diverse variants of professional courses adjusted to the Project participants' psychophysical possibilities, as well as to the labour market needs. It was also an obligation of this institution to prepare *Workshops of Active Job-Hunt* for those who had completed a course and *The Businessman's ABC* directed to those who were interested in taking up a free-lance business activity.

Ali actions of Bydgoszcz In-Service Training Centre aimed at raising the Project participants' awareness of their own professional skills, acquiring new professional qualifications and skills adequate to the labour market needs, active search of a job and preparing to freelance activity.

### **Methods and tools applied**

During the Project implementation the following methods and tools were used:

- a battery of psychological tests;
- individual approach towards the Project participants;
- method of verifying the effectiveness of computer skills courses thanks to the Electronic Base of Knowledge implementation;
- diagnostic tests examining participants' vocational predispositions (carried out by a representative of a labour office and a psychologist);
- designed course programmes for the people of low qualifications.

### **Methods of monitoring and supervising the project implementation**

According to the Development Partnership Agreement, all Partners implementing the Project are obliged to fulfil regulations of this agreement and carry out their duties. Therefore, Partnership Administrator manages, supervises and monitors tasks set for Partnership. Whereas content-related tasks which are to be implemented by Partnership, are approved and assessed one Partnership Steering Committee was appointed within the Project (PSC). The Partnership Steering Committee consists of representatives of all Partners and a representative of Administrator, in the discussed case, PSC consists of four people — four women who represent four Partners. PSC is entitled to make decisions on the most important Project issues during its board meeting which usually take place twice a month. Ongoing coordination of the Project works is carried out by the Project manager and the Project coordinator who have a definite range of responsibilities.

Almost from the very beginning of PSC functioning, participants of the Project have been involved in the process of its management. It is in accordance with the principles of the Project strategy and with "The Supplement to Operational Programme of the Community Initiative EQUAL for Poland 2004-2006". This document also defines the principles for implementing the monitoring procedures, formats of reports and the schedule. The system is based on monitoring of achievement three detailed objectives of the Project, which make the main objective. Specific result and output indicators were assigned to end these objectives, and they were monitored during the Project implementation. Monitoring of hard and soft results and the range of developed products were also taken into account<sup>41</sup>. Regarding the partnership character of the Project and its complexity it is assumed that the system of monitoring would be updated and adopted to particular phases of the Project.<sup>42</sup>

Taking into account the character of the Community Initiative EQUAL and according to the Directive of Regional Development Ministry of 17 February 2006, internal evaluation conceded also the implementation of the role of partnership, the way of carrying out transnational cooperation, implementation of the policies of gender equality (gender mainstreaming), the level of innovative character of the activities and dissemination of Partnership actions. Ex-post evaluation is also foreseen by the Project strategy and it will be carried out by an external expert.

Internal evaluation of the Project "Stand Up, Raise Your Head" was described as one of four examples of good practices in "Guide for self-evaluation of projects implemented within the Community Initiative EQUAL" published in 2006 by the Cooperation Fund, Task Force for Training and Human Resources - the National Support Structure of the Community Initiative EQUAL in Poland.

### **Research results**

Each of the project partners was obligated to achieve supposed soft results, e.g., raising self-assessment, gaining new qualifications; and hard results, e.g., getting certificates of a computer skills course. The results achieved by partners are presented below.

---

<sup>41</sup> Dokumenty Robocze Komisji Europejskiej: Dokument Roboczy nr 3; Wskaźniki dla monitorowania i ewaluacji: Zalecana Metodologia. Dokument Służb Komisji (DG ds. Polityki Regionalnej).

<sup>42</sup> „Podręcznik – Zarządzanie Cyklem Projektu” przygotowany w 2001 roku przez ITAD Ltd z Wielkiej Brytanii i zaktualizowany przez PARTICIP GmbH z Niemiec na zamówienie Komisji Europejskiej, Biuro Współpracy EUROPAID – Sprawy ogólne – Ewaluacja. Polska 2005 r.

Implementing the Project, Partners achieved the following results and designed following products:

The Project Administrator: Pomorsko Kujawskie Civic Mutual Aid Association

- a course book for trainees and trainers was developed as a part of implemented psychological workshops;
- the Unemployed Activation Centre- consisted of Labour Alert office and Hatchery of initiatives office - was set up it provided two parity pants, one woman and one man, with temporary employment;
- computer workstations for participants were set up in Administrator office;
- 6 issues of information Bulletin were published;
- promotion actions such as exhibitions of products manufactured by the Project participants during craft workshops were organized;
- 3 psychological examinations were carried out in order to diagnose participants' psychical condition and 3 reports concerning the result' were prepared;
- individual work of group guides with the Project participants lasted during the whole Project, it consisted in monitoring changes which occurred in the Project participants' lives, guides also helped participants solve their problems;
- a series of meeting with a psychologist took place within the framework of the task named Eagle Nests; under the influence of monitoring recommendations their form was changed to Labour Workshop (also with a psychologist's participation);
- a base of local employers and a base of products manufactured by participants during craft workshops were prepared. Partner No 1: Poviast Labour Office in Żnin;
- 36 Individual Actions Plans were designed for the Projects participants;
- a language course of English on the communication basic level for 36 participants; from whom 28 lasted out to the course end;
- 26 people completed the course obtaining certificates confirming the participation. 29 people took the final exam and 28 of them passed, but 2 people were not given certificates because of their absence during the cases;
- the course programme for the people of low qualifications was elaborated;
- a series of meetings with Your Job Adviser providing participants with knowledge on job offers in the country and abroad and on acute trends on the labour market were organised;
- law expert opinion concerning seasonal work was expressed.

Partner No 2: Jan and Jędrzej Śniadeckis' University of Techno and Natural Sciences in Bydgoszcz.

- the concept of "Friendly Training Programme" and the concept of "The Electronic Base of Knowledge" were developed;
- the software of "The Electronic Base of Knowledge" was developed;
- 36 training units were designed as the course materials for participants;
- an ability of unassisted use of a computer and the Internet was achieved by 32 people (89%), among them there were 20 women (80%),
- an ability of using a spreadsheet Excel was acquired by 35 people (97%), among them - 20 women (95%) and 15 men (100%),
- 33 (91%) Final Beneficiaries are able to use a programme of multi-time presentation Power Point, among them there were 21 women and 12 men (80%),
- an ability of unassisted use of e-mail was achieved by 34 Final Beneficiaries (94%), among them there are 20 women (95%) and 14 men (93%),
- an ability of unassisted use of the Internet was acquired by 32 Final Beneficiaries (89%), among them 20 women (95%) and 12 men (80%).

Partner No 3: Bydgoszcz In-Service Training Centre

- vocational courses were completed by 34 people, among them there were 21 women and 13 men (one man had given up before vocation courses started and another one did not complete any course);
- the course participants obtained 63 certificates of different types;
- 3 men passed specialised qualifying exams of a welder and got qualifications. During the Project implementation two men found employment in their job;
- workshop of Active Search for a Job, organized at the end of a vocational course was completed by 25 people, among them there were 16 women and 9 men;
- 12 people — 7 women and 5 men completed more than one vocational course;
- 29 people completed craft workshops and were given appropriate certificates;
- 18 vocational courses were organized;
- 3 craft courses were organized: glass painting, basketry and ceramics;
- 20 people worked as trainees within the framework of vocational courses — during the course or after its completion;
- the workshop named Businessman's ABC was carried out for 4 women interested in freelance activity.

### **Conclusions**

The project implementation was an example for applying rules of partnerships, which are among essential principles supporting structural policies in the European Union.

The application of the principle of partnership for practical project implementation will gain great significance for future actions.

The analysis reveals that combining psychological support, vocational training courses and professional activation may contribute to the return to the labour market.

In 2007 it turned out, that it is possible to prolong the Actions 2 of the Community Initiative EQUAL financed from the European Social Fund. In relation to this, since August 2007, the implementation of this action has been commenced in a group of the same partners, using the verified method of tasks. The conclusions included into the publication “Good practices in the realization of computer trainings for people of low professional qualifications” were one of the bases of this verification. The project is performed in a 12-people group, including 10 women and 2 men.

During the second half of 2006, the result of the Development Partnership “Stand Up” – “professional activation model for the people at risk of social exclusion was validated clearing the way for implementers of Action 3.

### **References**

1. Dokumenty Robocze Komisji Europejskiej: Dokument Roboczy nr 3; Wskaźniki dla monitorowania i ewaluacji: Zalecana Metodologia. Dokument Służb Komisji (DG ds. Polityki Regionalnej).
2. Podręcznik – Zarządzanie Cyklem Projektu” przygotowany w 2001 roku przez ITAD Ltd z Wielkiej Brytanii i zaktualizowany przez PARTICIP GmbH z Niemiec na zamówienie Komisji Europejskiej, Biuro Współpracy EUROPAID – Sprawy ogólne – Ewaluacja. Polska 2005 r.
3. <http://www.equal.gov.pl/>
4. <http://www.equal.org.pl/>
5. [http://ec.europa.eu/employment\\_social/equal/index\\_en.cfm](http://ec.europa.eu/employment_social/equal/index_en.cfm)
6. <http://www.projekt-sampo.com.pl>

## Assessment of the Possibilities to Use Outsourcing in Production of Food Products

Andra Zvirbule-Bērziņa Dr.oec., associate professor

Department of Business and Management, Faculty of Economics, Latvia University of Agriculture

Aldis Gailītis MBA; "Tetra Pak" Ltd

### Abstract

The research explores theoretical foundation and life cycle of outsourcing, as well as the possibilities for the use of outsourcing in food production in the future. The study dwells upon the analysis of the company's Tetra Pak Ltd experience, the analysis and rating of possible outsourcing customers, as well as the development and rating of two variants for outsourcing offers.

**Key words:** outsourcing, food production

### Introduction

Nowadays one of the most relevant tendencies of the global business development is to commit services not related to the company core activities to professional providers of outsourcing. Although the use of outsourcing has already started in the 1970s and the 1980s of the 20<sup>th</sup> century, the use of outsourcing in Latvia has begun only relatively recently. The pace for the use of outsourcing rapidly increases with Latvia's accession to the European Union, simultaneously with the growth of economic development and intensifying of competitiveness among companies. The companies in Latvia have started to use outsourcing services more extensively; however there are no scientifically-practical researches done on the use efficiency of outsourcing and types of its application.

Based on constantly growing development of outsourcing offer and structural opportunities in Latvia it is possible to advance the following **hypothesis of the research** – the use of outsourcing is potential in provision production of food products in Latvia.

In compliance with the set hypothesis the following **research aim** was set – to study the necessity for outsourcing and types of outsourcing in the production of food products on the basis of production information of a certain company.

#### The tasks of the research:

- to assess theoretical justification and position of outsourcing;
- to characterise production tendencies of liquid food products;
- to evaluate the type of outsourcing in the production of liquid food products.

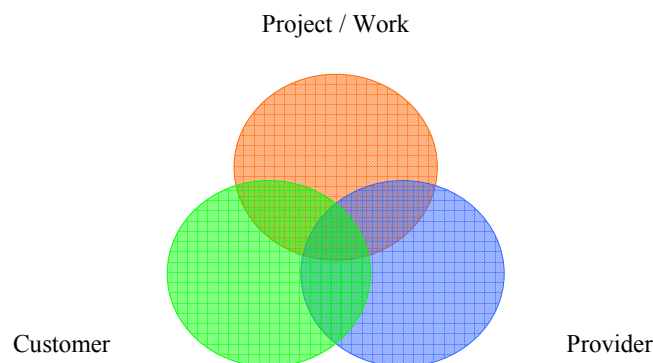
The following **research methods** have been applied to achieve the set aim and develop the advanced tasks: monographic – to form the theoretical discussion; logically constructive – to form the research structure; statistically forecasting methods – trend modelling, forecasting of seasonal fluctuations – to determine tendencies for the production of liquid food products in a company; and rush interviews - with the leading specialists and industrial employees of Tetra Pak to clarify the necessity for outsourcing in individual production fields.

### Results and Discussion

#### 1. Possibilities to use outsourcing in production

Currently the use of outsourcing is already worldwide known for a long time, and more constantly it spreads in Latvian economy. Yet the interpretation and definition for application of outsourcing is relatively spacious. In Latvia the Commission of Terminology, Latvian Academy of Sciences has adopted the following definition of outsourcing: the use of outsourcing is the use of services provided by another company to develop a new product or improve the product developed earlier. While Heywood, J. Brian (2002) has defined outsourcing as the transfer of a company's non-core business functions performance to a third party or external outsourcing service provider in a long-term. The principle of outsourcing may be depicted with 3 mutually interlinked components – customer, provider and work.



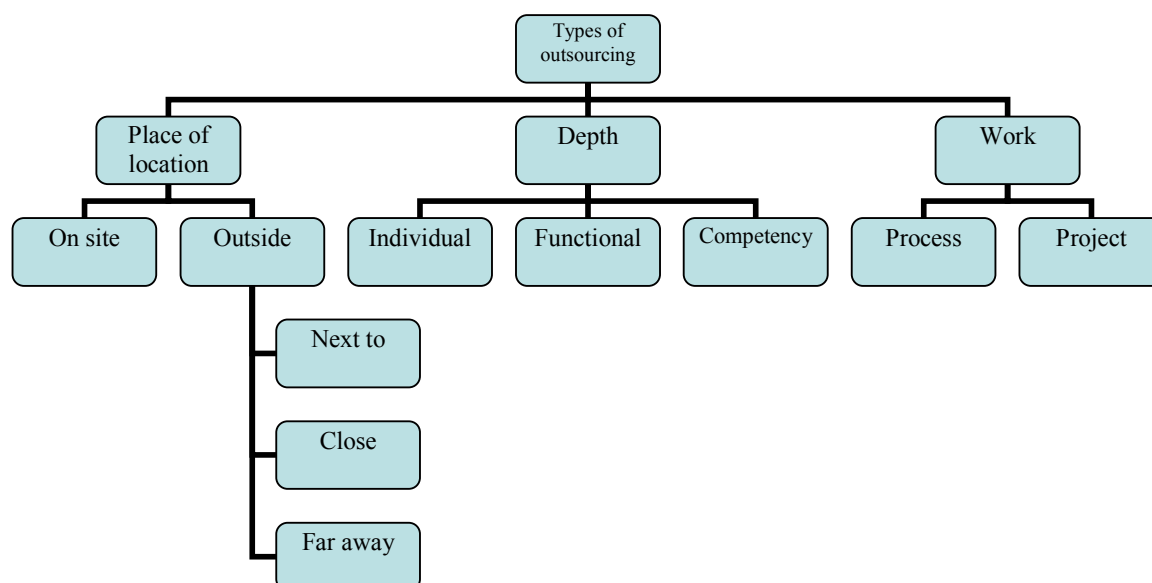


**Figure 1. Principle of outsourcing**

Source: Heywood, J. Brian (2002)

More detailed evaluation of mutual interrelation of the above mentioned components shows that the customer is a company, which would like to use outsourcing, for example, to commit any of its tasks or functions to a third party. The provider is a provider of a service or work, which will overtake or manage the task of outsourcing. Project or work is the existent work the customer wants to transfer to a provider for fulfilment, and it may be simple work or complicated task of any type of work. The provider of outsourcing is not related to the customer and work prior to the commencement of outsourcing service; yet the work and customer are interrelated. After the commencement of the contract on outsourcing, the customer transfers part of its functions to the provider, as a result the provider is both related to the work and customer. As it is shown in Figure 1, after the conclusion of contract on outsourcing work performance all the three components – customer, work and provider become mutually interrelated and dependent. It means that winners and losers are both the customer and the provider; thus the selection of a right provider, precise determination of work performance goals and tasks, mutual communication and other factors play an important role in outsourcing. J. Power Mark (2006), an English scientist, has defined types of outsourcing and established the classification of outsourcing.

*Location of outsourcing:* outsourcing may take place either on site in the company or it may be implemented outside the company – receiver of outsourcing, and be located far away, close to or next to the company. The activities of some food production companies of Latvia producing well known food products outside Latvia could be mentioned as an example. *Depth of outsourcing:* outsourcing may be applied only for an individual process, or substituting functional processes or specific components in the company, for example, information technologies. *Work content of outsourcing:* outsourcing may be applied in the framework of a particular project or in a constant process of the company. In general the study of all types of outsourcing leads to the conclusion that outsourcing is a very wide notion and it is applied in any sphere. However according to *the Outsourcing Institute* the transfer of IT services to professionals and issues related to a company administration are the most popular types of outsourcing.



**Figure 2. Types and classification of outsourcing**

Source: J. Power Mark (2006)

The share of business process outsourcing constantly increases in outsourcing services. Outsourcing in a production company is prospective, since it may ensure economic benefits in the future. According to the experts of the *Outsourcing institute* information technology outsourcing and business process outsourcing are the most rapid growing spheres of outsourcing.

## **2. Production tendencies of liquid food products in the company Tetra Pak**

The research delimitation is connected with the specifics of the company under the study, as the company Tetra Pak mainly operates as the supplier of cardboard packing material for juices, milk, as well as cold drinks. The existent production lines of the existent customer, production tendencies and forecasted production figures are used for the purpose of calculations.

According to the information provided by the Marketing Department of the company Tetra Pak, both the segment of juices and cold drinks have good possibilities and perspectives for development, the fact that the average consumption of juices in the Baltic states equals to 25 – 27 litres of juice per person a year, while in the Eastern Europe countries it already comprises 50 litres on average, and in the Western Europe countries the consumption of juices even exceeds 70 litres of juice per person a year could be mentioned as an example. It means that the segment of juices has good perspectives for future development, consequently also possibilities for service expansion and innovations.

Based on the experts' evaluation for the purpose of the research it is assumed that the analysed production line produces juice and drinks. Besides every production line is individually configured according to the type of packing, capacities of product blanking equipment, packing requirements of ready packs, types and other wishes of the customers using outsourcing.

The capacity of production line depends on the types of production equipment and the capacity of product blanking equipment that may vary between 3500 and 18000 packs per hour. The company has accepted the following capacities of production lines:

Production line 1 – packing 1500S – 5000 packs/hour,

Production line 2 – packing 1000B – 6000 packs/hour,

Production line 3 – packing 200S – 8000 packs/hour.

Based on the market situation and analysis of liquid food products, as well as the information provided by the managers of Marketing and Business Departments, the authors have used the following

Excel functions - Trend and Forecast - for statistical forecasting. In addition optimistic, realistic and pessimistic forecasts are provided for each production line.

**Table 1**

**Sales forecasts of packing materials (number of packings)**

	<i>Years Forecasts</i>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
<b>Production line 1</b>	Optimistic	16 350 000	17 334 000	19 602 000	20 394 990	21 817 026
	Realistic	15 000 000	16 200 000	17 820 000	18 711 000	19 833 660
	Pessimistic	13 500 000	14 580 000	16 038 000	16 839 900	17 850 294
<b>Production line 2</b>	Optimistic	23 520 000	25 870 000	31 046 400	34 603 800	37 787 350
	Realistic	22 400 000	23 520 000	25 872 000	27 683 040	29 067 192
	Pessimistic	17 920 000	22 338 750	22 731 912	20 762 280	21 800 394
<b>Production line 3</b>	Optimistic	22 126 000	22 338 750	22 731 912	22 873 986	24 584 563
	Realistic	17 020 000	17 871 000	18 943 260	19 890 423	20 487 136
	Pessimistic	15 318 000	15 190 350	16 670 069	15 912 338	15 365 352

The annual number of working hours necessary for the production of planned number of packs is calculated on the basis of theoretical capacity of production lines and annual forecasted production volume.

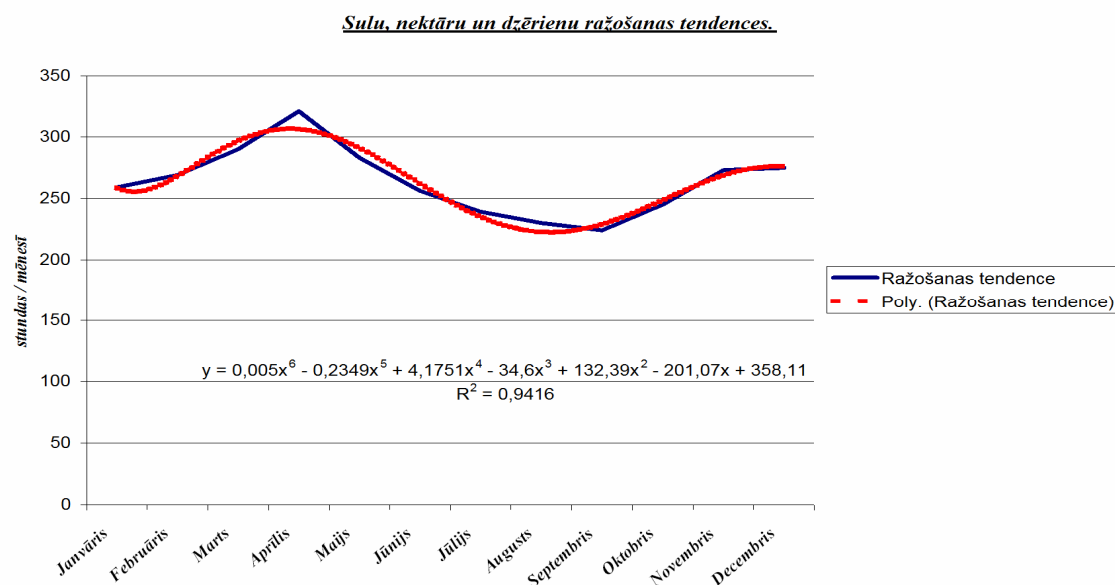
**Table 2**

**The necessary working hours per year for pack production**

	<i>Years Forecasts</i>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
<b>Production line 1</b>	Optimistic	3270	3467	3920	4079	4363
	Realistic	3000	3240	3564	3742	3967
	Pessimistic	2700	2916	3208	3368	3570
<b>Production line 2</b>	Optimistic	3920	4312	5174	5767	6298
	Realistic	3733	3920	4312	4614	4845
	Pessimistic	2987	3332	3881	3460	3633
<b>Production line 3</b>	Optimistic	2766	2792	2841	2859	3073
	Realistic	2128	2234	2368	2486	2561
	Pessimistic	1915	1899	2084	1989	1921

The production of juices, nectars and drinks is typically seasonal, as it is shown in Figure 3. The production trend is calculated on the company data of production in 2006, where the figures are broken by months and the determination coefficient is calculated.

According to Figure 3, the largest increase of production is observed in April due to the warmer weather conditions and the fact that people prefer juices and nectars to hot drinks. The largest decline in production is observed in September due to the availability of fruit in autumn.



(Legend: production tendencies)

**Figure 3. Trend model for the production of juices, nectars and drinks**

The annual forecast for production trends is calculated by means of the Microsoft Excel software function "Solver" and applying the function for juice seasonality. The forecast is broken by months.

**Table 3**

**Forecast of production tendencies (hours in month)**

	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
<b>Production line 1</b>	245	256	288	299	282	248	218	203	210	232	255	263	<b>3000</b>
<b>Production line 2</b>	309	314	328	333	325	310	297	291	294	303	313	317	<b>3733</b>
<b>Production line 3</b>	169	187	242	260	230	175	123	99	111	147	186	199	<b>2128</b>
<b>TOTAL</b>	<b>723</b>	<b>757</b>	<b>858</b>	<b>892</b>	<b>837</b>	<b>734</b>	<b>638</b>	<b>593</b>	<b>614</b>	<b>683</b>	<b>754</b>	<b>780</b>	<b>8861</b>

The calculations done above are used further in the research for the selection of type of outsourcing and calculation of its profitability.

### 3. Selection and evaluation of outsourcing model

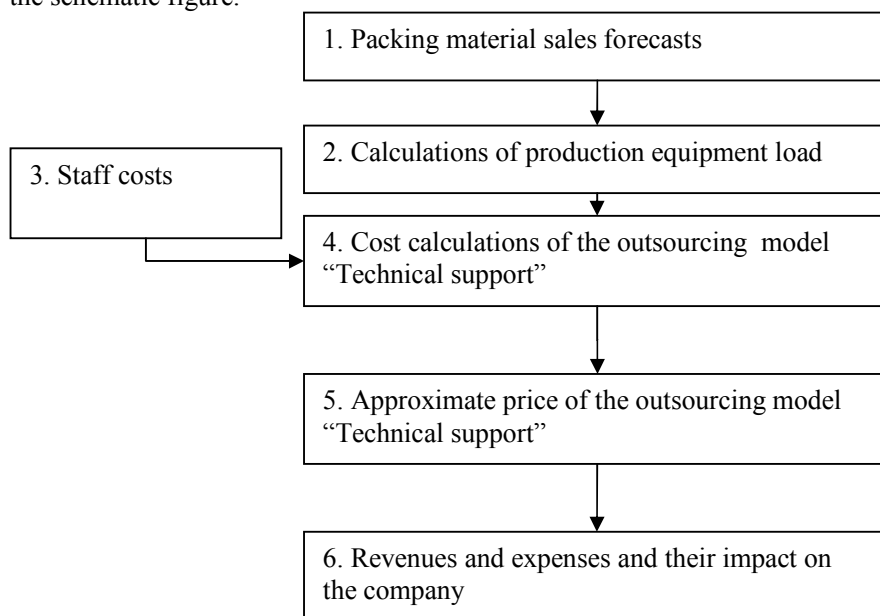
The evaluation of the following outsourcing model - *provision of technical support* is posed based on the calculations and considerations done above. It means that continuous daily supervision of production lines, technical service, maintenance and provision of spare parts are ensured to the company – receiver of outsourcing.

*The aim of provision of technical support:* to ensure efficient technical operation of production lines belonging to the company – receiver of outsourcing.

The provision of technical support has the following tasks:

- a) to perform daily technical support to the customer's production staff;
- b) to perform weekly and regular technical maintenance of the equipment;
- c) to perform technical administration of production lines, and supply of spare parts;
- d) to control and ensure efficient production operation of production lines in compliance with the set efficiency indicators.

The economic benefit of such outsourcing is based on the indicators and calculations summarised in the schematic figure.



**Figure 4. The general scheme for calculation of a definite outsourcing – technical support**

The possible company revenues and expenses by months are calculated based on packing material sales forecasts, seasonality indices and the price of outsourcing. Expenses include staff costs per month and approximate costs for spare parts excluding unforeseen expenses. Therefore it is possible to draft a cash flow forecast for the coming five years.

**Table 4**

**Cash flow forecasts for the outsourcing model - Technical Support between 2008 and 2012**

<i>Years</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>
<b>Forecasts</b>					
<b>Revenues (thou. LVL)</b>	217.7	230.4	250.5	265.1	277.6
<b>Expenses (thou. LVL)</b>	134.2	152.6	173.6	197.4	224.3
<b>Changes</b>	<b>+83.4</b>	<b>+77.7</b>	<b>+77.0</b>	<b>+67.7</b>	<b>+53.2</b>

The changes between revenues and expenses included into Table 4 may not be considered as the profit of outsourcing, but only as indicative information, as unforeseen expenses are excluded from the expenses. However the dynamics of revenues and expenses leads to the conclusion that expenses will grow faster by 14% per year on average, while the growth of revenues ranges between 6% and 9%. The increase of expenses for spare parts of production equipment due to the aging of equipment explains the tendency.

In general the outsourcing model - technical support is suitable for the company, yet apart of financial benefits outsourcing results also in indirect benefits:

Benefits to the customer:

- ✓ reduced production losses of all types,
- ✓ increased efficiency of production equipment,

- ✓ reduced administrative load of the customer technical management,
- ✓ reduction of financial risks.

Indirectly resulting benefits:

- the competitiveness of the customer increases due to the more efficient use of production lines,
- sales of packing material is promoted,
- attraction and keeping of the customer,
- growth of the customer's satisfaction.

The outsourcing model – technical support has good development opportunities, since it has diverse activities and is guided towards:

- 1) customers with large volumes of output;
- 2) customers experiencing the necessity to improve the indicators of production efficiency;
- 3) new customers having no stable base for ensuring production.

### Conclusions

1. Outsourcing is defined as a type of service to be applied in the operation of production companies.
2. There exists scientifically justified definition and classification of outsourcing that helps professional entrepreneurs structure and differentiate possible outsourcing services.
3. Due to the operation specifics and production forecasts of the company Tetra Pak, it is possible to select and substantiate the most appropriate type of outsourcing. The forecasts on production volumes of liquid food products, production seasonality and number of working hours used are based on such calculations.
4. The selection and evaluation of the outsourcing model – technical support leads to the conclusion that expenses would experience more rapid annual growth by 14% on average, while the growth of revenues ranges between 6% and 9%.
5. Benefits not directly related to the financial advantageousness of outsourcing serve as additional arguments for selection of outsourcing. These are mainly benefits that help a particular producer attract a customer by applying additional services.

### Proposals

1. To develop additional variants for every type of outsourcing, so the receiver of outsourcing may choose the most appropriate service.
2. To assess and foresee possibilities to avert risks related to outsourcing.
3. To elaborate a detailed scheme for the introduction of outsourcing.

### References

1. Ārpakalpojumi – Latvijas uzņēmumu iespēja (Outsourcing – Opportunity for Latvian Companies) // Latvijas vēstnesis: [www.lv.lv](http://www.lv.lv)
2. Božkovs Vladislavs. Vai ārpakalpojumu izmantošanā slēpjas biznesa panākumu atslēga? (Is Business Efficiency Hidden behind the Use of Outsourcing?) // [Publicēts: 14.10.2004] [www.arhivs.db.lv/magazine/print.php?aid=103057](http://www.arhivs.db.lv/magazine/print.php?aid=103057)
3. Heywood, J. Brian Аутсорсинг :в поисках конкурентных преимуществ (Outsourcing – Looking for Competitive Advantages) /Дж. Брайан Хейвуд ; [пер. с англ. Н.Е. Метоль, И.С. Половицы]. Москва : Вильямс, 2002. 174 с.
4. Krieviņš Mārtiņš. Gaidāms ārpakalpojumu bums (Increase of Outsourcing is Expected) // [Publicēts: 02.03.2006] PricewaterhouseCoopers [www.arhivs.db.lv/magazine/print.php?aid=120536](http://www.arhivs.db.lv/magazine/print.php?aid=120536)
5. Power Mark J. The Outsourcing Handbook : how to implement a successful outsourcing process / Mark J Power, Kevin C Desouza, Carlo Bonifazi. - London ; Philadelphia : Kogan Page, 2006. - xvi, 222 p.
6. The Outsourcing Center. [www.outsourcing-europe.com](http://www.outsourcing-europe.com)
7. The outsourcing Institute portal. [www.outsourcing.com](http://www.outsourcing.com)
8. Unpublished information of the company Tetra Pak.

# PIEZĪMES

# PIEZĪMES