Competitiveness of the economy in the context of social policy measures – international perspective

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This monograph has been prepared under the Multi-Annual Programme 2015-2019 "The Polish and the EU agricultures 2020+. Challenges, chances, threats, proposals". It contains the selected papers which were presented during the conference organized by IAFE-NRI in the days of 22-24 June 2016 in Jachranka, Poland.

The purpose of the publication is to present to the reader the main issues associated with shaping the social policy in the context of competitiveness of agriculture and the food economy at the national and global levels. The publication particularly aims to present problems of the social and economic policy from many viewpoints, taking into account its relations to both measures of the Common Agricultural Policy of the EU and the general global situation.

Spis treści

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1. Introduction

An analysis of social polarisation of rural areas and a social policy-making framework in the context of development of competitiveness of agriculture and the food economy at global and regional scale is an important element of modern scientific research. Pursuing rational economic policy with regard to social problems is timeless and lasting. The modern world is full of conflicts and contradictions to be handled by economic and social policies. To meet the challenges of the 21st century, these two policies should be pursued in parallel. Economic growth as well as continued and sustainable development remain unquestionably of interest to economic policy. Social policy is focused on measures to, among others, reduce poverty and excessive income inequalities, growing labour and political migration, to counteract growing demographic problems, to reduce unemployment, to improve health care conditions, the efficiency of social security systems and access to education. The above challenges often depend on the growing public finance deficit or market and state failures. These challenges are of particular importance. In the 20th century, the mainstream economy moved away from dealing with social problems, letting other disciplines handle this task. As a matter of fact, it was assumed that the economy's most important objective is effectiveness. In the 21st century, the question of how to reconcile improvement in economic effectiveness with objectives of broadly understood social policy arises again. It turns out that effective economic policy, including agricultural policy, cannot be pursued without taking into account social needs and effects.

This monograph continues the trend of interdisciplinary research, which was started at the end of the 20th century, extending the "sectoral" approach to include economic and social problems for their joint and comprehensive analysis. A multithreaded way of portraying problems of economic and social policies in individual countries, which is typical of the publication, presents them in close connection with measures of the EU Common Agricultural Policy and the global context. The presented material may serve not only for scientific discussion purposes, but it may also be helpful when making future decisions in the economic and political sphere. Comparing experiences from different countries and assessing introduced solutions may prove useful in this regard. All countries

faced, face or will face similar problems, but the way they seek to solve them differs. It is worth building on these experiences.

This publication contains selected papers delivered in English at an international conference, entitled "Competitiveness of the economy in the context of social policy measures", held by the Institute of Agricultural and Food Economics – National Research Institute in Jachranka on 22-24 June 2016 as part of the Multiannual Programme 2015-2019, entitled "The Polish and the EU agricultures 2020+. Challenges, chances, threats, proposals". The conference was attended by approx. 150 participants, including representatives of scientific research institutes, higher education institutions, public administration, politics, agricultural advisory facilities, banking and insurance sectors, trade organisations and business practice. The thematic scope of the conference covered issues related to, among others:

- regional and local development and socio-economic cohesion in rural areas;
- effectiveness of CAP instruments and other programmes of public intervention;
- role of institutions in the creation of human capital;
- transformations in technical and socio-economic infrastructures of rural areas;
- possibilities of development and improvement in the competitiveness of agriculture and the food economy;
- diversification of sources of livelihood of rural inhabitants;
- building of innovative systems of knowledge and information in agriculture;
- changes in labour resources in agriculture and the role of human capital in the socio-economic development of rural areas.

The relationship between economic and social policies, between public expenditure and its impact on the economic situation of agricultural holdings, the population's income and socio-demographic changes ongoing in rural areas and sustainable development remain the main themes of this monograph. Authors of individual chapters intend to refer in their studies to the problems referred to above.

In the second chapter of this publication, Dr Potori Norbert; Dr Tikász Ildikó; Dr Varga Edina; Dr Garay Róbert; Dr Hamza Eszter; Dr Rácz Katalin; Dr Biró Szabolcs from the Research Institute of Agricultural Economics in Budapest, Hungary, analyse the social aspect of changes in the structure of agricultural holdings in new EU Member States following their accession to the Community. According to the authors of the publication, the most important directions of structural transformations include: a decline in the number of and an increase in the size of agricultural holdings, the development of production specialisation, growth in capital intensity, a decline in and the ageing of the rural population, an increase in the employment of women in agriculture and growth in social capital.

In the third chapter, Dr Hans C.J. Vrolijk from the LEI Wageningen University, the Netherlands, points to the need for pursuing policy and scientific research in the context of social and environmental aspects of agricultural holdings' operation. Against the background of economic, environmental and territorial transformations in rural development, the author of the publication points out the need for introducing new policy rules such as: profitable food production, sustainable natural resource management and sustainable territorial development. These rules set targets for necessary reforms that are crucial for achieving higher competitiveness, better sustainability or higher efficiency.

In the fourth chapter, Prof. PhDr. Ing. Věra Majerová and Ing. Jiří Sálus from the Czech University of Life Sciences discuss the economic and social context of Czech social policy. Against the background of socio-economic characteristics of rural areas, they define objectives, tools, institutions and areas of action of social policy. They also define the relationship between social policy and economic policy and, at the same time, stress that social policy cannot be financed and pursued without a functioning economy. According to the authors, social policy activates human capital and promotes the political stability of society, thus influencing the development of the economy.

In the fifth chapter, Prof. Masahiko Gemma from the Waseda University in Tokyo, Japan, and Dr Mariusz Hamulczuk from the IAFE-NRI in Warsaw refer to issues of productivity in EU agriculture and consequent implications for Polish agriculture. The authors explain the design of the TFP index, which is based on the Solow model, and present this index for individual EU Member States. The research also refers to the size of support for income and employment. It reveals that TFP growth is higher in countries with lower support and therefore the policy of subsidising agricultural holdings is an ineffective tool for boosting productivity in agriculture.

In the sixth chapter, Eng. Chaloupka Ondřej, Dr Pechrová Marie, Prof. Doucha Tomáš from the Institute of Agricultural Economics and Information in Prague, the Czech Republic, present socio-economic effects of the Rural Development Programme implemented in 2007-2013 in the Czech Republic. The chapter presents methodological assumptions of the evaluation conducted based on the developed model. Effects of the Rural Development Programme in Bulgaria were also analysed in the seventh chapter of this publication. Its authors, i.e. Prof. Julia Doitchinova, Prof. Ivan Kanchev and Prof. Hristina Harizanova from the University of National and World Economy in Sofia, presented issues of the multifunctionality of area development and its support in Bulgaria based on instruments of the RDP 2007-2013. Against the background of characteristics of natural and climatic conditions of Bulgarian agriculture, the authors of the

chapter discuss basic economic and social indices, assumptions and amounts of expenditure on various measures as part of the RDP and the transformations observed. They also presented objectives and assumptions of the RDP 2014-2020.

In the eighth chapter, Prof. Jonel Subić, Dr Vesna Popović and MSc Marko Jeločnik analyse priorities of sustainable development of agriculture and rural areas within the region of Eastern Serbia. In the paper, the authors analyse the potentials and limitations for the development of agriculture and related activities in the region, as well as explained all the needs for the state improvement and recommendations for priority measures to support agriculture and rural development.

The ninth chapter by Dr Slavka Krizova, Eng. Maria Jamborova, Eng. Zuzana Chrastinova, Eng. Dagmar Matoskova from the National Agricultural and Food Centre – Research Institute of Agricultural and Food Economics in Bratislava was devoted to economic and social characteristics of agriculture and food industry in Slovakia. The authors discuss changes since Slovakia's accession to the EU in production volume, income, foreign trade, support sizes, the development of corporations in the food industry, employment in agriculture and the processing industry.

In the tenth chapter, Prof. Boris Frumkin from the Russian Academy of Sciences discusses the doctrine of food security in Russia as well as in relation to economic and social issues. The author presents changes in the Russian agrifood sector due to the embargo imposed on the import of agricultural products, among others, from Poland in 2014. The paper discusses changes in foreign trade, investment, the production of agriculture and the food industry, the availability of food products for the population. It also outlines issues of public support and changes in retail prices of food. The author stresses a clear negative impact of the embargo on the Russian consumer market, including – among others – higher prices, lower purchasing power, higher expenditure on food in income, lower product quality, higher consumption naturalisation, higher inflation and social consequences of these negative effects. However, the author indicates that the effects of the embargo in the Russian agri-food sector may bring positive effects such as the development of domestic agriculture and the food industry which started attracting Asian investment.

The eleventh chapter by Dr Cecilia Alexandri, Dr Lucian Luca, Dr Monica Mihaela Tudor from the Institute of Agricultural Economics – Romanian Academy refers to food security issues in Romania. The analysis was carried out at the macro level (country) and the micro level (household and private consumption). The authors determined food security dimensions, i.e.: meeting the demand by domestic agriculture, supply stability, adequate quality and availabil-

ity at the economic level (determined by income and the level of economic development). According to the authors, strategic priorities in the area of food security in the Development Strategy of Romania for the next 20 years include growth in consumption, including of products of which Romania is a net importer, obtaining "food exporting state" status and improving access to food.

In the twelfth chapter, Prof. Dr Dimitre Nikolov and Prof. Dr Minka Anastassova-Chopeva from the Institute of Agricultural Economics in Sofia present studies on the Economic Assessment of Neonicotinoids' Use Restriction on Sunflower and Maize Farms in Bulgaria and their Reaction. By analysing the level of costs and prices of grain, the authors study the level of income loss. Furthermore, they take into account costs related to e.g. alternative pest control or the need for re-sowing. The programme of neonicotinoids' use restriction is to prevent bee poisoning and it was implemented because of the importance of honey production in agricultural regions of Bulgaria.

The monograph ends with a concluding chapter on the competitiveness of the economy in the context of social policy measures which brings together the most important conclusions of the papers presented in the previous chapters. The papers enriched us with new experiences with, knowledge of and information on problems faced by different regions of our continent. Undoubtedly, the importance of economically and socially sustainable development, and of the balance between the production and consumption of safe food and social policy is appreciated everywhere more than before. The presented papers give us a better insight into measures undertaken in different countries to mitigate risks, forecast transformations in agricultural production, food production or demographic changes. We realise that, despite the length of the study, we did not answer all questions related to the issue analysed. One thing is, however, certain – the subject of this publication is important enough to recognise that the issues should be subjected to further research, substantive discussions and conclusions should be communicated to the public, the administration and politicians. We thus leave ourselves the possibility to further discuss the subject referred to above. The multiannual programme, entitled "The Polish and the EU agricultures 2020+. Challenges, chances, threats, proposals", implemented in 2015-2019 by the Institute of Agricultural and Food Economics – National Research Institute offers us such a chance. We will further discuss the subject at seminars and conferences held by the Institute as well as in the publishing series of Multiannual Programme Monographs. We thus encourage all readers to monitor results of our scientific research and deliberations via, among others, the Institute's website: www.ierigz.waw.pl

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2. Changes in farm structures from a social aspect in the post-socialist EU Member States since their accession to the EU

2.1 Introduction

Structural change in the agricultural sector of the European Union (EU) broadly trends towards fewer, larger and more capital-intensive farms, and a declining farming population of an increasing average age. Structural change, however, is a complex phenomenon which occurs at a different pace across the regions of the EU [EC 2011a].

The organisation, size and specialisations of agricultural holdings as well as their mix of production factors are important parameters for the designing of future policies, therefore understanding their development is of core importance. The aim of this paper is to briefly analyse the changes in farm structures in the post-socialist Central and Eastern Member States (MS's) of the EU (EU-10[1]) through the period since their accession to the EU from a social aspect. For the analysis, EUROSTAT databases were used extensively. Trends in farm structures have been presented mainly through the changes in Common Agricultural Policy (CAP) context indicators retrieved from the 2005 and 2013 Farm Structure Survey (FSS) databases. Three basic physical and economic size categories of agricultural holdings have been defined and used, which correspond to the farm structure indicators defined by the European Commission (EC). The FSS has important limitations, both at the country and the aggregated level, which have been taken into account as far as possible in order to avoid misinterpretations.

This paper is based on a study prepared for the AGRI Committee of the European Parliament [Biró *et al*. 2016].

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[1] The EU-10 comprises of Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. Thus the EU-10 differs from the EU-12 (the classical typology for the 'new' MS's until the accession of Croatia) in that it excludes Cyprus and Malta, which do not belong to the post-socialist Central and Eastern European block of MS's.

2.2   Methodological issues

The FSS has limitations which deserve careful attention. For each country, the FSS database contains projections from a representative sample to holdings above specific physical thresholds[2] (area and number of livestock species) therefore the FSS data may not mirror real-life agricultural activities entirely. The selection of the representative samples for the FSS is based on the preceding Agricultural Census (full-scale survey). The longer the time gap between the Census and the FSS, the less representative the sample may be.

The physical thresholds have not remained constant over the past decade. According to Eurostat [2015] the coverage of the FSS was changed from 99% of the Standard Gross Margin[3] (SGM) before 2010, to 98% of the UAA and 98% of the livestock from 2010 onward. Parallel to this, new and more detailed physical thresholds were defined in Annex II of Regulation (EC) No 1166/2008. Countries were allowed to set alternative thresholds to exclude very small holdings from the Surveys as long as the minimum coverage was guaranteed. This led to changes in the thresholds in a number of countries, and thus also in the coverage of the subsequent Surveys. Of the EU-10, in the case of Poland and Slovakia, the minimum UAA of holdings surveyed was increased from 0.1 hectares to 1 and 2 hectares, respectively, and also in the Czech Republic, the threshold was raised from 1 hectare to 5 hectares. As Eurostat [2015] explains, changes in the thresholds in these countries mainly affected trends in indicators using data on labour force and the number of holdings[4], and consequently indicators related to holding characteristics. In the cases of the Czech Republic and Slovakia, changes in the thresholds also impacted on specific livestock and land use categories for which analysing trends would require the application of the 2010 thresholds for 2005. However, it is not possible to filter the 2005 FSS data according to these new thresholds. In addition, such a correction would have disregarded a considerable proportion of the small holdings in the past. In contrast to the countries above, Romania for instance, with the largest number of farms among the post-socialist countries by far, has not applied any FSS thresholds.

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[2] Physical thresholds limit the survey population and thereby the survey sample and costs.

[3] The Standard Gross Margin is a measure of the production or the business size of an agricultural holding based on its separate activities or 'enterprises' and the relative contribution of these to the overall revenue.

[4] According to EUROSTAT [2015], if the same thresholds had been applied to the Survey in 2005 as in 2010, in Poland 24.9%, in Slovakia 48.3%, and in the Czech Republic 42.2% of the farms would have been not covered.

Another change in the FSS methodology in 2010 which bears importance for the analysis was that data on common land[5] were collected from all EU MS's for the first time. Of the EU-10, common land was covered in the preceding Surveys in Romania alone. According to EC [2013], in the case of Bulgaria, common land which has been covered in the FSS from 2010 onward accounted for 859 thousand hectares or 18.5% of the UAA managed by FSS farms. This common land was used by 191 thousand agricultural holdings. Common land has been covered in the FSS since 2010 also in Hungary and Slovenia. According to EUROSTAT [n.d.], in these countries common land consisted of common grassland and meadows totalling 74 thousand and 8 thousand hectares respectively, causing negligible changes to the surveyed UAA. There is no common land in the other EU-10 countries. There is no information on the distribution of common land by farm size categories in the FSS.

2.3 Changes in the number of farms and land use

In the EU-10, the number of farms declined by 27.7% between 2005 and 2013 compared to 24.1% in the EU-15. But in many of the EU-10 MS's, the changes seemed more substantial, ranging up to 37.9% and 42.3% in the cases of the Czech Republic and Poland respectively, or even to 52.4% and 65.6% for Bulgaria and Slovakia. In contrast to this, the number of farms decreased with a much lower pace, by 14.7% in Romania, pulling the average of the EU-10 down, closer to the average of the EU-15. In Poland, Slovakia and the Czech Republic, the spectacular decrease in farm numbers between 2005 and 2013 can be attributed mainly to the changes in the physical thresholds of the FSS in 2010. Bulgaria deserves particular attention since the decline in farm numbers has been the fastest by far in this country: just between 2010 and 2013, 31.3% of Bulgarian agricultural holdings ceased to exist. Many of these were small farms specialised especially in livestock production with no or less than 2 hectares of UAA. For small farms, according to Nikolov *et al.* [2014], the reasons for quitting agriculture include limited access to the market, weak bargaining power, high transaction costs and the unwillingness to cooperate. While the physical thresholds of the FSS remained unchanged between 2010 and 2013, farm numbers in the EU-10 as whole showed only an 8.0% decline versus 15.0% in the EU-15. Notwithstanding the case of Bulgaria, this phenomenon can be explained in part by the fewer alternative employment opportunities in many of the rural areas of post-socialist countries [Swinnen *et al.* 2001].

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[5] Common land is the UAA on which, although managed by an agricultural holding, common rights apply. Common land can consist of pasture, horticultural or other land.

Although the total UAA managed by FSS farms remained almost stable in the EU-27 between 2005 and 2013, in the EU-10 it increased by 3.1% during this period. This was primarily driven by increases in the FSS UAA in Bulgaria (70.4%), already explained, in Estonia (15.5%) and Latvia (10.3%) where demand for agricultural land intensified after EU accession in response to the introduction of the CAP, in particular of direct support which also attracted foreign investors in the Baltic countries, and in Hungary (where the increase in UAA was 9.1%). However, in the case of the latter, this growth was overwhelmingly due to the inclusion of UAA in the FSS which could not be identified with farms before 2010. It should be noted that in Bulgaria the total UAA managed by FSS farms increased by only 3.9% between 2010 and 2013, a moderate and more realistic change which can be explained by land of very small farms, excluded from the Surveys, ceasing to exist and taken over primarily by large tenant farms specialised mainly in cereals and oilseeds production.

In the EU-15, 72.1% of the UAA was managed by large farms (with more than 50 hectares) and 3.3% by small (with less than 5 hectares) farms in physical terms in 2013. In the EU-10, large farms managed 56.9%, and small farms 13.5% of the UAA. The concentration process seemed more pronounced in the EU-10 during the period 2005-2013, and it differed from that observed in the EU-15 insofar that while the proportion of large farms increased by a pace of around twofold, the proportion of small farms declined the most. While changes in the management structure of UAA by these physical farm size categories were limited in the Czech Republic and Slovakia, all other post-socialist countries experienced a considerable increase in the share of large farms on the expense of the other size categories (also in absolute terms, especially in Bulgaria, Poland and Romania). Again, the Baltic countries deserve special attention due to the far above average drop in the share of medium-sized farms in managing UAA. For instance, in the case of Lithuania, Melnikiene and Volkov [2013] explain this trend by large farms becoming financially stronger compared to medium-sized farms due to CAP direct support which enabled these to invest more into modernising production technologies and to expand by buying or leasing land. In contrast to the Baltic countries, in Bulgaria and Romania it was the share of small farms that declined above average. Romania, where no physical thresholds were applied for the FSS, deserves particular attention in this respect: the UAA managed by Romanian small farms dropped by almost 1.4 million hectares or 27.0% between 2005 and 2013 parallel to the disappearance of almost 524 thousand such holdings.

2.4 Changes in the number of livestock

According to 2013 FSS data, there were over 129 million livestock in the EU-27 expressed in livestock units (LSU), 5.7% less than in 2005. Of these, 82.9% were held on farms in the EU-15, while farmers in the EU-10 held the remainder. From 2005 to 2013, the cumulated number of livestock in the EU-15 dropped by 2.9%, and in the EU-10 by 17.1%. Since the UAA remained about the same, the livestock density gap between these two groups of MS's widened over the period: the density index for the EU-10 decreased from 0.56 in 2005 to 0.45 LSU/hectare in 2013, while that of the EU-15 was down by just 0.02 to 0.86 LSU/hectare.

These figures indicate that the livestock sector of the EU-10 was impacted by EU accession, and data obtained from the economic accounts for agriculture (EAA) confirm this assessment. Valued at constant 2005 EUR prices, the average output of the EU-10 livestock sector during the period 2012-2014 was 5.2% lower than in 2005, while the output of crop production grew by 9.6%. Comparing the changes in livestock numbers and output volumes, it can also be concluded that the efficiency of livestock production in the EU-10 improved in parallel of its shrinking.

Concerning the changes by livestock species, the number of pigs in the EU-10 fell the most, by over 11 million or 32.6% between 2005 and 2013. The Czech Republic, Slovakia and Slovenia lost close to half of their herds, but the reduction was almost general across the MS's, Estonia being the sole exception. There was, however, no exception to the declining trend in the number of dairy cows, although the 21.7% decrease in the overall herd size seems less radical than in the case of pigs. The most rapid reductions occurred in Lithuania and Romania. The total number of cattle and the poultry flock in the EU-10 fell only modestly during the time period, by 5.5% and 3.7% respectively. In both cases the individual MS data show larger variations by far. For cattle, losses that occurred in Romania and Lithuania, and to a smaller extent in the other EU-10 MS's, were partly compensated by the increases in Poland, Hungary and Latvia. Close to 80% of the total poultry flock of the EU-10 were held in Poland, Romania and Hungary in the years of the Surveys. These leading producers reported 1-7% fewer animals in 2013. The EU-10 sheep herd increased by a considerable 10.6% during the time period, mainly due to Romania which now has a nearly three quarter share in the total number of sheep.

These developments in livestock numbers were in parallel to the drop in the number of livestock holding farms. While in 2005 around 6.5 million farms of the total of 8.5 million in the EU-10 were involved in livestock production, their number fell to 4.3 million by 2013. No EU-10 MS could avoid this decline;

in Slovakia and in Bulgaria the register of livestock holders was reduced by 70.5% and 61.7% respectively, and it was halved in the Baltic States and in Poland. The share of large farms with more than 50 hectares UAA increased in livestock numbers in almost every EU-10 MS, mainly at the expense of small farms with less than 5 hectares of UAA, except for the Czech Republic and Slovakia where the share of large farms was way above the EU-10 average already in 2005.

2.5 Changes in farm labour

In the EU-10, the equivalent of 4.7 million people (expressed in AWU) worked on farms, representing 50.5% of the total labour force in agriculture in the EU-27 in 2013. During the period 2005-2013, the farm labour force in AWU in the EU-10 declined by 29.6%, compared to a decline of 23.1% in the EU-15. Poland and Romania utilised the most labour for agricultural production in 2013, 1.9 and 1.6 million AWU respectively. As these two countries accounted for 73.6% of all EU-10 agricultural labour in 2013, they have an overwhelming influence on agricultural labour force indicators in the EU-10. Together with Hungary and Bulgaria, the share of these countries reached 89.6%. During the period 2005-2013 the total labour force in agriculture declined in every EU-10 MS; Slovakia and Bulgaria suffered the highest losses, 48.8% and 48.75% respectively, while the most moderate decrease occurred in Hungary (6.3%).

According to the data of the Economic Accounts of Agriculture (EAA), the share of salaried labour input in the agricultural labour force was 14.5% in the EU-10 and 32.2% in the EU-15 in 2013. The long-term trend is that labour use in agriculture is declining across the EU; however, the use of salaried labour is decreasing more slowly than non-salaried labour, and its share in the total labour input is therefore increasing.

Among the EU-10 MS's, there are substantial differences in the shares of salaried and non-salaried labour inputs in the agricultural labour force. In the Czech Republic and Slovakia, the share of salaried labour input was over 70% in 2013, while in Poland and Slovenia it was less than 10%.

EU-10 agriculture is dominated by family farms, where family labour represented 90.3% of the total regular labour force in agriculture in 2013, compared to 75.0% in the EU-15. The family labour force (also expressed in AWU) decreased by 31.4% on average in the EU-10 during the period 2005-2013, and by 30.7% in the EU-15 at the same time. This can be explained by the drop in the number of sole holders' holdings – the main employer of the family labour force in agriculture – partially due, again, to the changes in the FSS thresholds.

In the EU-15, 45.8% of the family labour force in agriculture worked on medium-sized farms, and 33.3% on farms up to 5 hectares UAA in 2013. By contrast, in the EU-10 the share of the family labour force in agriculture working on small farms was 62.0% compared to 35.0% for medium-sized farms. MS's where the family farm labour was employed predominantly on small farms were Bulgaria (84.6%), Romania (84.1%), Hungary (76.1%) and Slovakia (55.8%), while the same holds true for medium-sized farms in Latvia (58.8%), Estonia (54.3%) and the Czech Republic (54.6%). In the Czech Republic, farms over 50 hectares UAA were the second largest employer of the family labour force in agriculture (28.9%) in 2013. In the EU-10 the proportion of the family labour force in agriculture grew by 4.3% points on medium-sized farms and by 1.5% points on large farms between 2005 and 2013. The most significant changes occurred in the Czech Republic and Slovakia in each of the different size categories, which cannot be interpreted as the direct impact of the change in thresholds significantly affects the results of labour force in agriculture in both countries.

2.6   Age structure

The restructuring of agriculture has been largely influenced by demographic trends, of which one bearing particular importance is the reduction in the agricultural workforce of active age group as a result of lifestyle changes, migration and ageing [Chavas 2001]. Major consequences of the reduction of the potential labour force supply are mechanisation substituting manual work, a shift to an extensive production structure and the simplification of the product structure [Möllers *et al.* 2011].

A major driver of the growth of farm size is the long-term opportunity to hand over and operate accumulated resources. When the problems of the replenishment of labour force and farm succession are tackled, the likelihood of the implementation of long-term, large-scale investments increases [Zagata and Lostak 2013]. Young farmers are more open to innovation and they pay more attention to the sustainable use of natural resources. For example, Kucińska *et al.* [2010] draw attention to the fact that young, skilled Polish farmers are more likely to join environment protection programmes and to shift to organic farming than elderly farmers. The process of concentration in land use as well as the retirement of elderly farmers may improve the opportunities for young farmers to develop and to remain in agriculture. Zimmermann [2011] confirms that the chance of the disposal of smaller farms with farm managers aged over 62 are the highest, which provides prospects of growth for the remaining farms.

The key factors slowing down changes in the age profile of the agricultural population are limited access to production resources (land, capital, etc.) and the high transactional costs of farm handover [Swinnen and Knops 2013]. Demographic renewal in the EU-10 is also hindered by low wages and the low prestige of agricultural jobs in accordance with changing lifestyles, the low standard of living in many rural areas and the problematic access to basic business services [Székely 2009]. The pace of generation shift can be influenced by variables such as the health of farm managers and the expected amount of the retirement pension, professional qualifications of the potential successors, marital status and traditions of farming within the family [Tietje 2003; Rossier 2008]. In addition, the demographic renewal of agricultural society in the EU-10 is delayed owing to restricted opportunities for income generation in rural areas, a lack of jobs and wages below the EU average [Davidova *et al.* 2009].

According to 2013 FSS data, the age structure of farm managers in the EU-10 followed the trends characteristic of the EU-27: in the case of the two extreme categories the managers of 32.0% of the farms were over 65 years of age, while the share of young managers under the age of 35 was 6.7%[6].

In the EU-27, Polish farmers had the most favourable age structure (as 12.1% of farm managers were under the age of 35 in 2013). The proportion of young farm managers also exceeded the EU-10 average in Slovakia and Estonia (8.1% and 7.5% respectively). In Poland the share of other active age groups (younger than 65) is higher than the EU-10 average, while the proportion of the age group over 65 years makes up only 9.6% of all farmers in this country.

The most elderly (above the age of 65) farm managers are in Romania (41.0%), Bulgaria (36.7%) and Lithuania (34.0%), where small farm units are dominant and relatively low or no survey thresholds are applied. The rate of young (under 35 years) farmers in all of these MS's is lower than the EU-10 average (Romania: 4.7%; Bulgaria: 6.4%; Latvia: 5.6%). Regarding the EU-10 as a whole, farmers managing less than 5 hectares UAA predominate among farm managers both of the oldest and the youngest age groups. In the EU-10 65.7% of those younger than 35 and 89.4% of the age group over 65 years were cultivating less than 5 hectares, in contrast to the EU-15 where the shares are only 31.0% and 62.4% respectively (Table 1).

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[6] Abandonment of farming by those over 65 years can have a significant impact on the farm structures change in the short-term, therefore emphasis was placed on the characterisation of this age group.

Table 1. Distribution of farm managers by age and UAA, 2013

Physical farm size (ha)	< 35 years			35 ≤ > 64 years			65 years ≤		
	EU-10	EU-15	EU-27	EU-10	EU-15	EU-27	EU-10	EU-15	EU-27
	thousand								
< 5	272.0	71.1	343.9	2,908.5	1,188.5	4,121.7	1,775.6	821.4	2,612.4
5 ≤ > 50	123.1	110.1	233.3	814.8	1,207.0	2,024.1	201.2	424.6	626.7
50 ≤ > 100	8.1	25.1	33.2	37.7	269.4	307.3	4.2	41.4	45.6
100 ≤	10.6	23.3	33.9	39.5	227.7	267.3	4.2	30.1	34.2
Total	413.8	229.6	644.3	3,800.5	2,892.6	6,720.4	1,985.1	1,317.3	3,318.9
	rate (%)								
< 5	65.7	31.0	53.4	76.5	41.1	61.3	89.4	62.4	78.7
5 ≤ > 50	29.8	48,0	36.2	21.4	41.7	30.1	10.1	32.2	18.9
50 ≤ > 100	1.9	10.9	5.2	1.0	9.3	4.6	0.2	3.1	1.4
Total	2.6	10.2	5.3	1.0	7.9	4.0	0.2	2.3	1.0

Source: EUROSTAT [n.d.].

Although in the distribution of the age structure of farm managers no significant changes can be observed in the period 2005–2013, the land use characteristics in the different age groups have changed. The number of farmers under 35 declined by two-thirds to 76.1% for example in Romania in the examined period, while among them the number of land users with over 100 hectares has multiplied. In addition to the RD measures which prefer the young people, national programs ('*Fermierul' / The farmer program, Life annuity program*) probably facilitated this process too [Luca 2009].

Between 2005 and 2013 Slovakia, Poland and Bulgaria had the highest proportions among the EU-10 of farm managers quitting farming above the age of 65. The share of farmers belonging to the oldest age group dropped to 25.5% in Slovakia, 32.8% in Poland and 42.1% in Bulgaria. Considering the characteristics of the age structure of farm managers in 2013, it becomes evident that structural changes related to the decision of farm managers to give up farming above the age of 65 can be anticipated in Romania, Bulgaria and Lithuania where this strata of farmers accounted for 37.8%, 28.7% and 25.0% of the total labour force, kept 26.4%, 15.8% and 14.6% of the total livestock, and cultivated 20.1%, 10.0% and 16.6% of the total UAA respectively.

Subsidies play a complex role in generation change [Zagata and Lostak 2013]. One of the impacts of introducing EU direct payments was that elderly farmers did not quit the sector (as they made a positive impact on agricultural

incomes and the improvement of chances of access to agricultural loans). Meanwhile, a high number of new entrants entered the sector with the help of the young farmer payment provided within Pillar II of the CAP (yet it has to be noted that some of them were not actual new entrants, but such young family members who formerly had been engaged in agricultural activity). Early retirement schemes were not efficient enough in several EU-10 MS's and it primarily actuated the handover of farms by such farmers who intended to quit farming anyway irrespective of subsidies.

2.7   Gender structure

Women are important drivers of structural change in agriculture as they are more open to innovation, introduction of new methods of production, technologies and products, besides which they take more initiative in creating partnerships promoting RD and access to markets [Franić 2015]. The role of rural women is determinative in the diversification of activities facilitating a balanced use of the labour force, and the extension of income generating opportunities (e.g. agri-tourism activities, production of handmade goods) as well as services available in rural space [EC 2002].

Although in the EU-10, similarly to the whole EU-27, the majority of farm managers are men, the proportion of female farm managers is remarkably higher than in the EU-15 (31.6% cf. 18.3%), especially among people aged over 65 years (43.6% cf. 33.1%), reflecting the lack of rural jobs or income generating opportunities. Regarding the specific situations within the MS's, the share of female farm managers is the highest in Lithuania (47.1%) and Latvia (45.2%), especially in older age groups [Franić 2015], in part explained by the higher migration ratio of men in the active age group and the higher life expectancy of women.

Strong male dominance is observable in the Czech Republic and Slovakia, where only 11.8% and 16.0% of the farms were managed by women in 2013. Between 2005 and 2013 the rate of the reduction of the number of female farm managers was the most rapid in Slovakia, the Czech Republic and Poland (28.0%, 43.0%, and 54.5% respectively). This trend can be attributed to the changes in the FSS thresholds in 2010, migration from agriculture to other sectors and retirement from agricultural work.

Regarding physical farm size categories, the larger the farms, the more males were employed in 2013. In the EU-10, the ratio of males to females in agriculture in each size category was below the equivalent value in the EU-15. This means that in the post-socialist countries the proportion of female labour in the agricultural labour force was higher on average. Moreover, regarding farms up to 5 hectares UAA, the gender ratio was almost 1:1, due to the high share of

family labour in the total regular farm labour force. As for the EU-10 MS's, in Slovakia, in all physical size categories, the ratios of males to females engaged were higher than the average, especially in small and medium-sized farms, where the ratio was almost twice as high as the average for the EU-10. In Bulgaria, Hungary and Romania the ratio on the large farms was significantly higher, above 3.3 compared to the 2.7 EU-10 average. By contrast, regarding Poland, Estonia, Lithuania and Latvia, the gender ratio was below the average in all size categories, which the Baltic countries turned to the benefit of female work force in farms up to 5 hectares UAA (Figure 1).

Figure 1. Gender ratio in the EU-10 Member States by the different physical farm size categories in 2013, and changes in % point, 2005 versus 2013 (on the right)
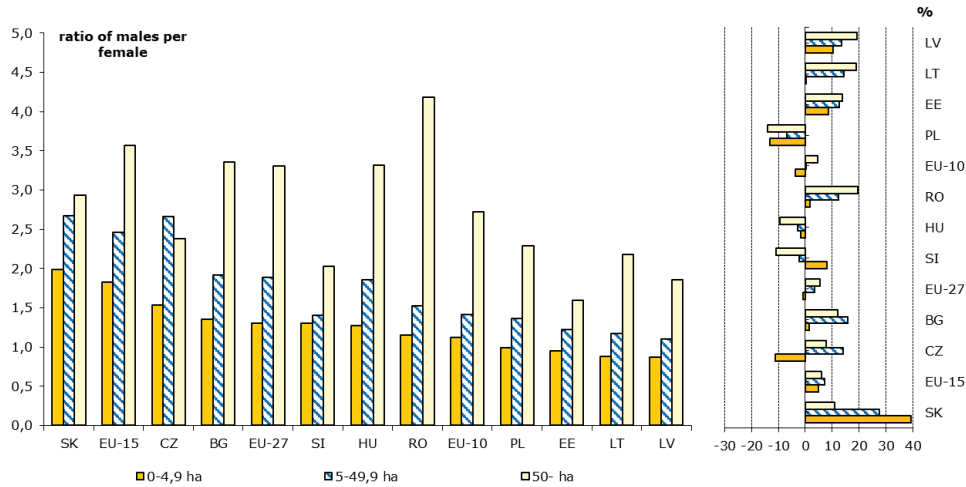
Source: EUROSTAT [n.d.].

Considering the gender distribution of employees of the agricultural sector, there are remarkable differences between the EU-10 MS's. Female employment in agriculture is typically strong in those countries where the share of the agricultural sector in the national economy exceeds the EU-27 average (e.g. Poland, Romania), or where supplementary activities related to agriculture and offering a more balanced use of labour force (tourism, leisure time activities) play a more important role (e.g. Slovenia) [EC 2012]. Full-time employment in agriculture is considerably less frequent among female employees compared to men, and female employees often act as dependents or invisible auxiliary family members instead of being employees satisfying the labour force demands of the farms, and they usually have unfavourable wages compared to men [EC 2012].

Although in 2005 almost 2.5 million farms were managed by women in the EU-10, in the RD programmes for the 2007–2013 period only modest attention was paid to gender aspects, while requirements for equal opportunities emerged primarily in relation to LEADER. The only exception was Lithuania, where in the case of a number of Axis 1 and Axis 3 measures, women were preferred and in the case of measures M311 *Diversification into non-agricultural activities* and M312 *Support for the creation and development of micro-enterprises* the share of female applicants who were planned to be supported was set at 50% [EC 2010].

2.8 Human capital

The presence and availability of qualified human capital is a basic condition for increasing agricultural productivity [Swinnen and Knops 2013]. Higher levels of qualifications and practical experience increase the adaptability of farms, promote specialisation and the application of innovative solutions, technologies and methods of productions [Baptista 2012]. Agriculture has become a knowledge-intensive sector. The management of challenges caused by the changes of economic, social and natural environment requires, besides traditional, farm-specific knowledge, the acquisition of new skills and competencies (e.g. ICT competence, command of foreign languages, marketing, etc.) [Dudek *et al.* 2014].

A number of researchers have pointed out that there is a strong, significant relationship between the investment activity, results of production and the level of professional qualifications of farm managers [Nowak 2014]. More qualified farmers not only adapt more easily to changing circumstances, but they are also more efficient in seeking and implementing new solutions [Biró *et al.* 2014]. A high level of professional training of farm managers greatly reduces the risk of liquidation of farms (Table 2).

Table 2. Distribution of farm managers by their vocational qualifications and economic farm size categories, 2013

Economic farm size (EUR)	Practical experience only			Basic training			Full agricultural training		
	EU-10	EU-15	EU-27	EU-10	EU-15	EU-27	EU-10	EU-15	EU-27
	thousand								
< 4,000	4,127.5	1,010.4	5,138.0	269.1	360.4	629.6	163.4	30.5	193.8
4,000 ≤ > 50,0000	954.2	1,145.3	2,099.5	261.0	795.6	1,056.6	285.1	135.9	421.0
50,000 ≤	41.2	289.9	331.1	29.1	480.0	509.0	68.8	236.2	305.0
Total	5,123.0	2,445.7	7,568.6	559.2	1,636.0	2,195.2	517.3	402.6	919.8
	rate (%)								
< 4,000	80.6	41.3	67.9	48.1	22.0	28.7	31.6	7.6	21.1
4,000 ≤ > 50,0000	18.6	46.8	27.7	46.7	48.6	48.1	55.1	33.8	45.8
50,000 ≤	0.8	11.9	4.4	5.2	29.3	23.2	13.3	58.7	33.2
Total	100	100	100	100	100	100	100	100	100

Source: EUROSTAT (2015).

Although human capital is a driver of increasing productivity, the level of professional qualifications of farmers in the EU-10 is very low[7] [EC 2013]. The majority of farmers (82.6%) carries out agricultural activity relying solely on practical knowledge. Only 9.0% of farm managers have taken part in secondary-level vocational training while the proportion of farm managers with a higher level of vocational training is 8.3%. The proportion of qualified farm managers is the highest in the Czech Republic, Slovakia and Poland, where half of the farm managers have taken part in basic or full agricultural training. The level of professional qualifications of farm managers is the lowest in Bulgaria and in Romania, which can be primarily explained by the high number of small farms that are managed on the basis of practical experience only.

The vocational training of the rural population aged between 25 and 64 is of basic importance to the operation of farms since it provides the labour force. Although in the EU-10 the share of citizens having basic or secondary education is higher than the average of the EU-15, taking into consideration general trends (i.e. the gradual increase in the level of skills through education, the spreading of the 'lifelong learning' model, the growing importance of non-formal (i.e. outside

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[7] Considering that in the EU-10 MS's self-employing individual farms predominate, an over-view of the human capital endowment of farm managers in presented.

of the education system) training and the growing number of students studying abroad), only a minor improvement can be observed in this respect compared to the average of the EU, especially in rural areas [Bencheva *et al.* 2014; Majerová *et al.* 2014; Wrzochalska 2014].

Of the EU-10 MS's, the level of educational attainment of the rural population is much lower than the average of the EU-15 (68.0%) in Bulgaria (62.6%) and in Romania (58.3%). The accumulation of human capital is restricted by that the model of 'lifelong learning' takes roots with a slow pace in the EU-10, with significant regional differences. While in the EU-15 10.3% of the population aged between 25 and 64 takes part in any kind of training annually on average, in the EU-12 the figure is only 4.4%[8]. In sparsely populated rural areas this figure is lower, 8.1% for the EU-15 and 3.0% for the EU-12.

The low level of human capital in the EU-10 can be explained by a number of factors. In the post-socialist countries at the beginning of the 1990s, in compliance with economic restructuring, actors with no agricultural training entered the sector en masse [Majóczki-Katona 2012; Dudek *et al.* 2014]. Agriculture and RD policy measures were focused mainly on the modernisation and establishment of production resources and infrastructure, while less attention was paid to investment in human capital. The increase in the educational level of workers in the agricultural sector is further hindered by low wages compared to other sectors of the economy which makes people with higher educational qualifications opt for non-agricultural jobs with more prestige and fewer physical demands [Rizov and Swinnen 2004; Swinnen and Knops 2013].

In the EU-10 there are no adequate, financially accessible and efficient knowledge transmission systems and farm advisory services which hinders human capital development. The existing institutions, mostly maintained by the state are of low operational efficiency, the mediated knowledge and information are outdated and their practical adaptability is limited [Velikov 2013; Fieldsend *et al.* 2015]. Although farmers' participation in training has increased remarkably in the last years due to the compulsory training courses attached to RD measures (e.g. M121 Modernization of agricultural holdings, M123 Adding value to agricultural and forestry products and M125 Infrastructure related to the development and adaptation of agriculture and forestry), at the level of farms, investment in human capital has not been a priority. Most farmers and agricultural policy makers may have not yet recognised that the higher the level of knowledge of farmers, the more capable they could be, not only to improve efficiency of production but also to adapt to environmental challenges and to market changes.

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[8] Aggregated data for rural areas are only available at EU-12 level [EC 2013].

2.9   EU support to agriculture

With the exception of Slovenia, the post-communist MS's introduced the Single Area Payment Scheme (SAPS) upon their accession to the EU in 2004 and 2007. The SAPS is a simplified income support scheme in effect until 2020, replacing most of the EU direct payments with a decoupled area based flat rate payment.

After accession to the EU, the phase in of EU direct payments has led to the gradual improvement of agricultural incomes in the EU-10. These payments, by giving an opportunity to a large number of subsistence and semi-subsistence farms to prolong their existence, thereby allowing them to retain jobs and the incomes related thereto, had an indirect impact on labour markets. In Poland, for instance, the growth of agricultural incomes outpaced the growth of the value of agricultural production seven-fold in real terms [Poczta 2013] which can largely be attributed to the adoption of the CAP. A rapid improvement in the livelihoods of a significant number of farmers and their families, members of cooperatives, land and capital owners, as well as of hired agricultural workers occurred.

In the EU-10, the increase in the level of support to farmers after EU accession improved their access to capital in general; however, the impact was not uniform across the regions due to the differences in unit amount of the payments, or across the businesses due to the differences in their physical size and specialisation. Farms large in physical terms became financially much stronger and could invest more into modernising their production technologies (resulting in the release of labour force), changing their production profile and expanding.

The overwhelming weight of area based decoupled payments under the SAPS, the generosity of the EU cereals intervention system (until a drastic cut in the quantities to be taken into intervention) and EU biofuel policies gave impetus to arable production mainly at the expense of livestock farming, especially in those EU-10 MS's where granivores were heavily supported and their market was kept isolated by protectionist measures until EU accession. Later on the price shocks on the international commodity markets and the concentration and intensification in livestock production further strengthened this process which has become a driver for concentration.

In response to the introduction of direct support, and also due to the relatively low level of land prices and rental prices, demand for agricultural land intensified in the EU-10, driven in part by foreign investors. Part of the EU direct support is capitalised in land rental prices (and in prices of various inputs such as seeds, fertilisers, crop protection chemicals, etc.) [Ciaian and Kancs 2012].

Coupled payments are negatively associated with exit rates, as they increase the marginal value of farm labour and encourage farmers to remain in the sector [Tocco *et al*. 2013; Hennessy and Rehman 2008]. Nevertheless, the intensity of labour use (working hours/hectare) has been declining faster in the EU-10 since the introduction of direct payments, although it has been observed in all regions of the EU, which is consistent with the general long-term decline in work force employment in the sector. The decoupling of EU direct payments has contributed to the accelerated reduction in the intensity of labour use in EU-10 agriculture [Petrick and Zier 2011] and the reduction has been more significant in countries and regions where coupled payments supported labour intensive activities.

Based on Council Regulation (EC) No. 1698/2005, RD programmes from 2007 to 2013 in the EU MS's aimed at improving the competitiveness of the agricultural and forestry sector (Axis 1), improving the environment (Axis 2) and the countryside, and promoting quality of rural life and diversification of the rural economy (Axes 3 and 4).

Measures aiming at improving competitiveness (under Axis 1) had on average higher shares of the budgets of the RD programmes (without spending on technical assistance) in the EU-10 MS's than in the EU-15. This reflects the clear difference between the basic needs of EU-10 and EU-15 farms in relation to competitiveness. Under Axis 1, measure 121 *Farm modernisation* had the highest share (35%) at EU-10 level. In this respect, Latvia (62%), Estonia (54%) and Slovakia (52%) were the leaders in this type of support. In Hungary, for example, the measure 121 supported the purchase of new machinery and equipment, especially for the post-harvest phase (since the average age of existing equipment was 12-15 years) and promoted energy saving and environment friendly technologies (e.g. adequate manure storage) [MARD 2013]. Promoting generational change[9] had also a significant share in Axis 1 expenditure (22%) at EU-10 level. Especially Poland focused on this topic (37% of the Axis 1 budget).

Axis 1 measures, especially farm modernisation, may have had a negative impact on the number of jobs in agriculture since labour is substituted by capital. In practice, however, only three MS's (Germany[10], France[11] and Hungary) reported that significant job losses originated from this measure in their mid-term evaluation reports [ÖIR 2012]. Others claim that investment support has no significant effect on levels of farm labour [Tocco *et al*. 2013]. At the same time, changing obsolete machinery to new equipment in the EU-10 means less pollution to the environment and improvement in the quality of life by making the

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[9] Measures 112 *Setting up of young farmers*, and 113 *Early retirement*.
[10] One region.
[11] An overseas region.

production process more convenient. There is a tendency in the EU-10 for support to flow to the more prosperous beneficiaries (e.g. in Poland) [ÖIR 2012] and this can be confirmed by FADN data in the case of investment support. This is more evident in the EU-10 MS's than in the EU-15.

Within Axis 2, the highest share of support both in the EU-10 and EU-27 average was targeted under measure 214 *Agri-environmental payments* (47% and 53% respectively). In Hungary for instance (with a share of 67% of the Axis 2 budget), these payments promote the adoption of methods protecting the environment, maintaining the landscape and the natural resources, and preserving the genetic base (soil protection, protection of surface- and ground waters, nature conservation, genetic conservation, reducing air pollution) [MARD 2013].

Poland, Latvia and Lithuania, on the other hand, spent significant shares of their Axis 2 budgets on the measure 212 *Payments to farmers in areas with handicaps, other than mountain areas*. At the EU-10 level this measure accounts for 27% of the Axis 2 budget. Slovenia, Slovakia and Bulgaria focused more on the measure 211 *Natural handicap payments to farmers in mountain areas*. Under the measure 215 *Animal welfare payments* Romania spent the highest share of the Axis 2 budget among EU-10 MS's (13%).

Axis 2 measures, especially those supporting handicapped areas and the agri-environment, have a positive effect on farm income and facilitate extensive production systems. The role of agri-environmental measures is to promote the conservation of natural resources and sustainable farming practices, and this can lead to slower increases in efficiency and productivity in agricultural production [Coelli *et al*. 2007]. Environmental and technical efficiency are strongly interrelated factors that influence the improvement of production performance [Guesmi and Serra 2015]. Agri-environmental measures, by facilitating extensive production systems, and environmental regulations increase farming costs and are perceived to reduce competitiveness.

According to EUROSTAT [2012] data, the share of agricultural area under agri-environmental measures in the EU-12 is only 9.7%, compared to an average of 20.9% for the EU-27. The proportion of the area under agri-environmental measure differs widely between the EU-10 MS's, but it is particularly high in Estonia (45.0%), Slovenia (44.0%) and Slovakia (34.0%). Agri-environmental measures maintain less productive producers in the agricultural sector, and thus hinder economic growth and structural change on many farms [ÖIR 2012].

Within the EU-10, the most important types of agri-environmental commitments in terms of area enrolled were those aimed at the management of landscape, pastures and high nature value farming. These types of commitments were popular in the EU-12: 64% of the UAA was covered under these types of

commitments. Agri-environmental measures under these commitments were implemented on 99% of the total affected area in Romania and 81% in Bulgaria. Discouraging farmers from leaving rural areas and the agricultural sector by increasing the marginal value of farm labour are considered effective RD tools [Tocco *et al*. 2013].

Axis 3 of the RD programmes can relate to structural change in two ways. Through the diversification measures (311 *Diversification into non-agricultural activities*, 312 *Business creation and development*, 313 *Encouragement of tourism activities*) it enables farms to choose non-farming activities as an alternative to leaving the sector. And at the same time quality of life measures (e.g. 321 *Basic services for the economy and rural population*, 322 *Village renewal and development*, 323 *Conservation and upgrading of the rural heritage*) help to create a liveable rural environment, thereby keeping the population at the countryside. Estonia spent the majority of its Axis 3 budget on business creation (58%) and rural services (38%) while Romania supported more the village renewal (68%). As a result of Axis 3 measures micro-enterprises were established; self-employment has increased and new jobs were generated in the service sector in each MS.

The impacts of agricultural policies are not independent of the macroeconomic effects and of the market and production structures of the given MS. Mixed results are reported for Rural Development (RD) supports due to the various effects of different measures [Tocco *et al*. 2013]. There is a conflict between the measures aiming at job creation and those targeting the improvement of labour productivity [ÖIR 2012]. However, according to the mid-term evaluators the decline in labour productivity might have been independent from the RD programmes [ÖIR 2012]. In the new programming period, based on Regulation (EU) No 1305/2013 of the European Parliament and of the Council, as an option for maintaining competitiveness and retaining farm labour at the same time, majority of the EU-10 MS's prioritised ecosystem measures promoting environmentally sustainable practices.

2.10 Conclusions

Agriculture in the post-socialist EU MS's has been characterised by the pronounced concentration in land use, the rapid simplification of production structure, the high proportion of family labour force and of women in the regular farm labour force, and the low level of investment in human capital in comparison with the EU-15.

As a result of ageing demography, the migration to cities and abroad, the rural population has been continuously declining in the EU-10, and the concen-

tration process of labour with low skills and outdated knowledge has been ongoing in the rural areas. Consequently, although in most of the EU-10 MS's a growing proportion of farmers has been supplementing their incomes from other gainful activities in predominantly urban areas, agricultural production still provides a significant share of household income in subsistence and semi-subsistence farms, thereby contributing to decreasing poverty – and to slowing the process of concentration.

While CAP RD measures promoted the rejuvenation of the farming society and improved productivity in the EU-10, direct payments have contributed to maintaining the older generation in subsistence and semi-subsistence farming. Thus, owing to demographics, large numbers of low-skilled, elderly people can be expected to leave farming. This will speed up the concentration of production resources in specialised holdings and there will be an increasing need for qualified work force, both in agriculture and – parallel to the further improvement of its productivity – in its downstream industries. Therefore, the restructuring of rural labour supply in order to meet this demand, and also paying more attention to gender-specific issues, is a considerable and urging policy challenge.

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3. Policy and research needs on economic, social and environmental farm performance[12]

3.1 Introduction

The common agricultural policy has evolved since the early sixties of the previous century (DG-Agri, 2012). In its inception phase, it was focused on providing food security for Europe and a fair standard of living for farmers in order to assure the continuity of agricultural production. Since then, a lot of things have changed. Societal expectations with respect to agricultural production have broadened. Society does not only expect a continuous availability of food, but also has a wide set of additional requirements with respect to food quality, food safety (for example use of pesticides, use of antibiotics), the environment (greenhouse gas emissions, acidification, eutrophication, pesticide use) and the role of agriculture in rural areas.

These societal expectations are also reflected in agricultural policies and the agenda for agricultural (economics) research. In the latest reform of the Common Agricultural Policy (CAP), a set of challenges were identified (EU, 2013). These challenges have been identified as economic (including food security and globalisation, a declining rate of productivity growth, price volatility, pressures on production costs due to high input prices and the deteriorating position of farmers in the food supply chain), environmental (relating to resource efficiency, soil and water quality and threats to habitats and biodiversity) and territorial (where rural areas are faced with demographic, economic and social developments including depopulation and relocation of businesses). These challenges have been translated in overall policy objectives and specific objectives for the reform.

Figure 1. Policy objectives of the CAP
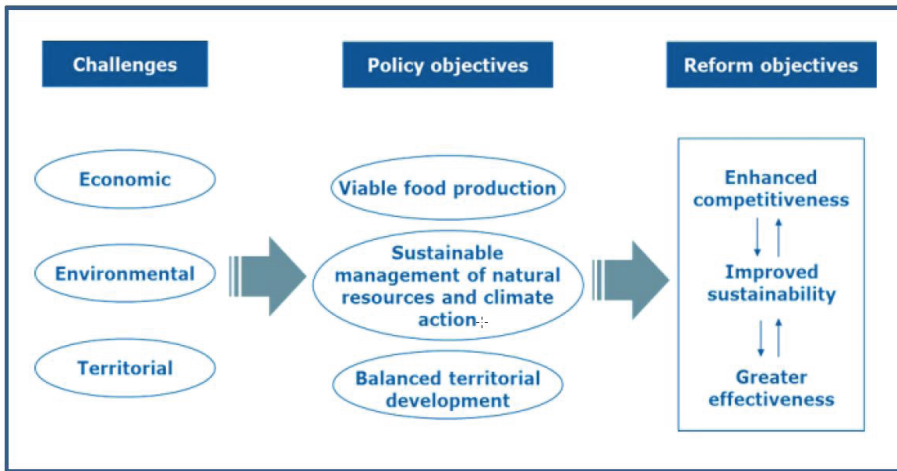
Source: EU DG-Agri.

The broadening set of policy objectives also has had an impact on the need for policy analysis and agricultural (economics) research. OECD (2015) provides an analytical framework with policy drivers of innovation, productivity and sustainability in the agriculture and agri-food sector. In this framework the impact of agriculture is not limited to productivity. Sustainability is an integral part of the outcome of the agricultural production. In this framework agricultural productivity and sustainability is thought to be influenced by 3 drivers of growth: innovation, structural change and the use of natural resources (see figure 2). These drivers of growth are affected by incentives stemming from different macro-economic, institutional, infrastructural and agricultural policies.

Figure 2. Policy drivers of innovation, productivity and sustainability in the agriculture and agri-food sector
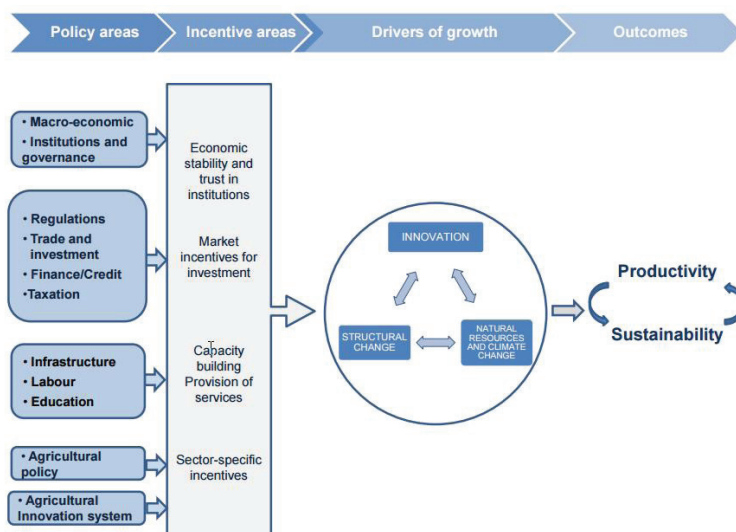
Source: OECD, 2015.

3.2 Data needs for new topics in policy analysis

Given these changes in policy objectives and research questions it is obvious that also information needs change. In general, data needs change if policy objectives change. In order to monitor and evaluate new policy objectives, relevant data should be available. In the current situation this availability of relevant data is a bottleneck. Although a set of well-established agricultural statistics is available for policy analysis, the adaptation of the content of these statistics is lacking behind. The availability of statistics is still very much focused on structure (Eurostat, farm structure survey) and financial economic results of farms (DG-Agri, EU FADN system). Some changes have been implemented (e.g. other gainful activities and mineral content of artificial fertilizers in FADN) but in general the official statistics adapt very slowly to new information needs and in the current situation there is a lack of data on the sustainability performance of farms.

Looking at OECD framework it can be concluded that productivity and structural change can be analysed by the current statistics (see for example Latruffe, 2010; OECD, 2015; Zimmermann and Heckelei, 2012; Kimura and Sauer, 2015). Issues like sustainability performance, innovation, use of natural resources and climate change are difficult to monitor and analyse due to a lack

of reliable and harmonised statistics at EU level. Empirical research in these areas is often based on ad-hoc data collection or data coming from national initiatives to monitor sustainability.

In reaction to this lack of data several indicator frameworks have been developed by a range of international organisations (such as United Nations millennium development goals, Eurostat agri-environmental indicators, European Environment Agency indicators, OECD agri-environmental indicators, FAO indicators of sustainable development). In addition several research projects have developed indicator sets (IRENA, AE Foodprint). Also at national level there are initiatives to collect data to measure the sustainability performance of farms (Dillon et al., 2010; Boone and Dolman, 2010; Platteau et al., 2014).

Overlooking these initiatives, the conclusion can be drawn that there is still no clear strategy for the future how to capture these information needs at a European level. The existing initiatives differ in level of measurement (farm, regional or national level), empirical implementation (some frameworks exist on paper but it is unclear how data should be collected) or are not harmonised across countries. Due to these issues there is not a clear strategy how to meet the information needs on the sustainability performance at farm level. To solve this issue, the EU commission has financed the FP7 project FLINT (Farm level indicators for new topics in policy evaluation) to address these questions and come up with recommendations for the future data infrastructure in Europe.

In the FLINT project an analysis of the policy needs have been made. Developments in the CAP, the rural development policies and related environmental policies have been analysed to determine the impact on information needs. Furthermore an extensive review of the literature and national initiatives has been conducted in all 9 partner countries to make an inventory of relevant indicators already developed or applied (Diazabakana et. al, 2014). A comparison of the policy needs and the identified indicators has resulted in 33 sustainability themes (Ryan, 2014). The sustainability themes cover all 3 sustainability dimensions of people, planet and profit. The 3 dimensions and the themes identified within these dimensions are given in figure 3.

Figure 3. Indicators of social, economic and environmental sustainability
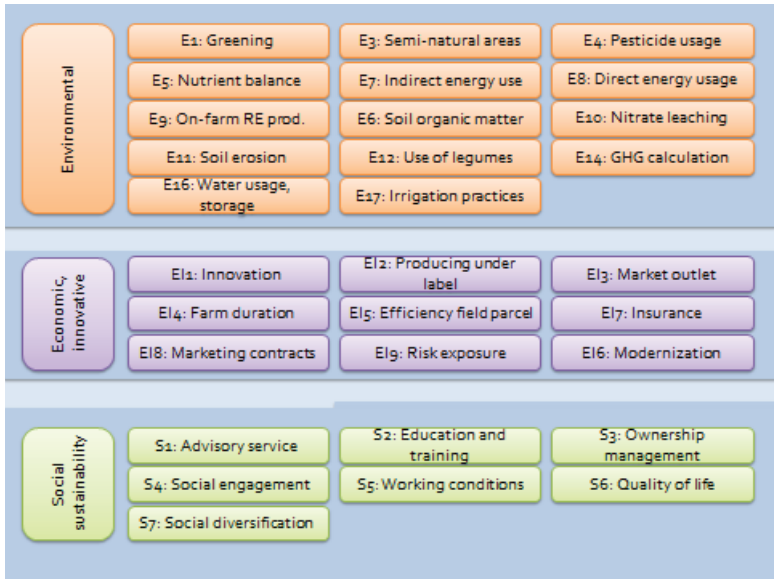
Source: EU FP7 FLINT.

These indicators have been discussed with policy makers and stakeholders in the agricultural sector to assure that indicators are relevant and feasible and to align information needs from the sector as much with the information needs of policy makers (Hererra et al., 2015).

3.3 Collection of farm level indicators of sustainability

The themes as described in figure 3 are not directly measurable at farm level. Therefore each of the themes has been translated in a well-defined set of variables with a detailed explanation and instruction for data collection (Kis-Csatari, 2015). In the scope of the FLINT project these variables are collected at 1000 farms in 9 partner countries. The FLINT variables are collected in addition to the regular FADN variables. FADN has been chosen as the starting point because FADN is the only well-established farm level data collection system on the performance of farms in Europe. It is extensively used for policy analysis and economic research (Vrolijk et al., 2004). It provides harmonised data at farm level, which is collected every year at a sample of about 80.000 farms across Europe. The advantage of using FADN as a basis in the FLINT project is that existing quality mechanisms in FADN can also be used for the FLINT data collection (e.g. selection plan and data checking). In theory, around 1000 new data items are added to the existing dataset, in

practise (due to the fact that only a subset of items is relevant for a specific farm) about 300-400 are added at farm level.

A clear advantage of having farm level data on the sustainability performance of farms is that it gives clear insight in the distribution and differences in farm performance between farms. Averages of farms are important to describe trends, but also the distribution of farm performance contains valuable information. Understanding this distribution is as well important for policy making (how are different farmers affected by policy measures and how would individual farmers respond to policy changes) as for farming practices (benchmarking and improvement of the sustainability performance of farms).

Measuring the different sustainability indicators at farm level results in an integrated dataset with the performance of farms on economic, environmental and social issues. Such an integrated dataset allows the linking of all variables within the database (planet – profit, organic <-> conventional, best 25% <-> worst 25%).

Such an integrated dataset also allows better policy analyses because the full chain from (1) policy objective to (2) policy measure to (3) pressure/incentive on a farm to (4) farm management decisions and finally (5) the impact on the sustainability performance of farms can be analysed. This is important because policy objectives are often aimed at for example environmental or animal welfare objectives. Policy measures do not directly affect the environment. Policy measures affect decision makers, in this case farmers, and farmers respond to policies. The resulting effects on farm practises affect the environment. It is therefore essential not to only measure environmental performance but also have data on the structure of the farm and farming practises. In the next section some examples of advantages of an integrated dataset are given.

3.4   Farm level analysis of sustainability performance

This section shows some results of farm level analysis of sustainability performance to illustrate the added value of an integrated dataset. Economic analysis of FADN data clearly show the strong diversity of farm performance (even within a specific type of farming and within a size class) (Vrolijk and Poppe, 2008).

Dolman et al. (2010) explored the variation in sustainability performance among 27 specialized fattening pig farms in the Dutch Farm Accountancy Data Network. To quantify the economic performance the net farm income (NFI) and labour productivity were used. With a life cycle assessment approach (LCA) the environmental performance was quantified for land occupation (LO), non-

renewable energy use (NREU), global warming potential (GWP), eutrophication potential (EP) and acidification potential (AP).

Looking at the economic results, the average NFI was -3.1 euro per 100 kg slaughter weight (SW), produced with a labour productivity of 0.4 hours per 100 kg SW. Figure 4 clearly illustrates that there are large differences in the economic performance. While the average is -3.1 euro per 100 kg, there were also farms with a NFI of more than 10 euro per 100 kg but also farms with less than -25 euro per 100 kg. Also the labour input per 100 kg slaughter weight shows a large variation.

Figure 4. Economic performance of fattening pig farms; net farm income and labour input per 100 kg slaughter weight
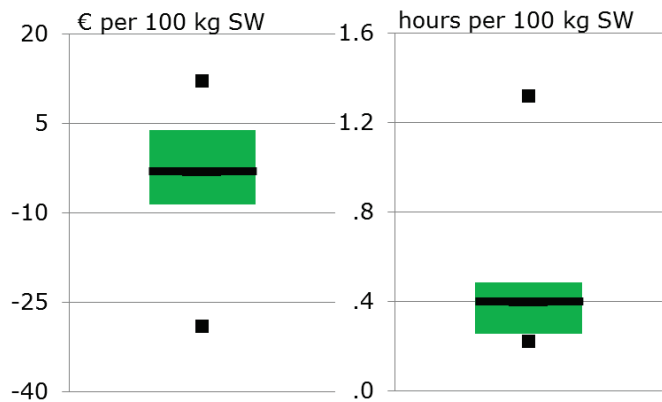
Source: Dolman et al. (2012).

In the same way, also the environmental performance differs strongly between farms (see figure 5). To produce 100 kg of SW, a total LO and NREU were needed of respectively 1121 m2 and 2802 MJ on average. GWP was 546 kg CO2-eq per 100 kg SW. Total EP was 61.4 kg NO3 -eq/ 100 kg SW, of which 53% from leaching of nitrate and 23% from phosphate. Total AP was 5.3 kg SO2-eq per 100 kg SW. These differences are important in understanding the impact of environmental policy measures. The differences are also important in identifying and implementing options for improvement at farm level.

Figure 5. Environmental performance of fattening pig farms; environmental impact per 100 kg slaughter weight
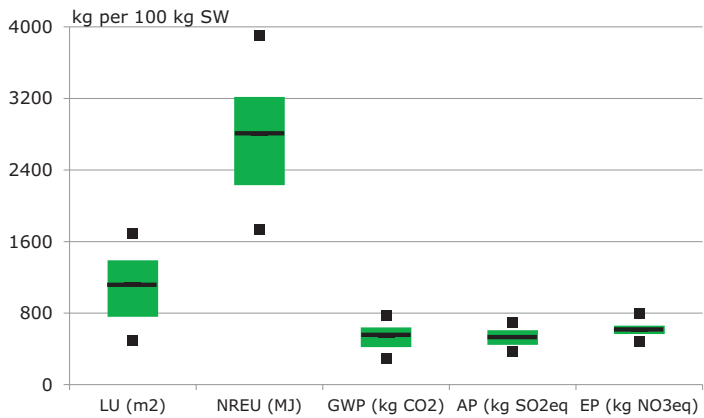
Source: Dolman et al. (2012).

The previous example describes the economic and environmental results as separate dimensions. The value of the data further increases if the economic and environmental performance are analysed in an integrated way. O'Brien et al. (2015) analyse the link between the economic and environmental performance of dairy farms in Ireland. The greenhouse gas emission (GHG) of milk for the bottom, middle, and top third of farms ordered in terms of gross margin per hectare are detailed in figure 6. The results show the GHG of milk generally decreased as economic performance improved.

Figure 6. Box plots of the carbon footprint of milk (kg of CO_2-equivalent/kg of FPCM) for the bottom, middle, and top third of Irish dairy farms ranked in terms of gross margin/liter of milk
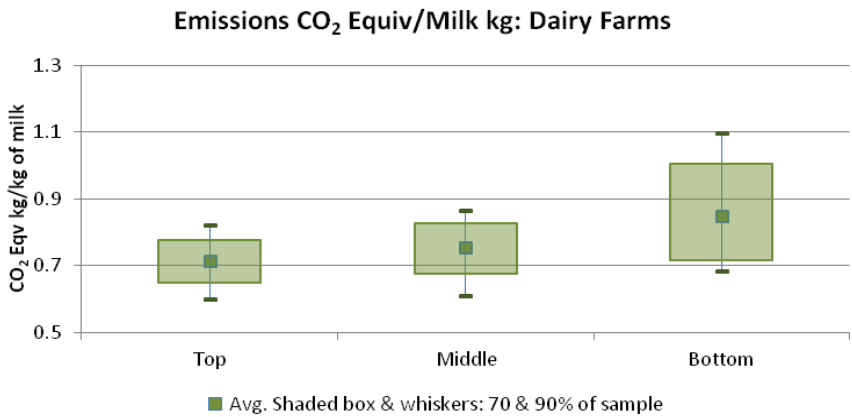
Source: O'Brien et al., 2015.

Positive relations between GHG impact and economic performance were predominately influenced by farm feeding practices, the length of the grazing season, and annual milk production per hectare and per cow. The authors conclude that to mitigate the GHG of milk and improve economic performance, grass-based dairy farms should not aim to only increase milk output, but instead target increasing milk production per hectare from grazed grass. This conclusion has implications for as well policies aimed at reducing GHG emissions as for the farming sector.

Still one step further in analysing sustainability performance is to integrate all dimensions of sustainability. Dolman et al. (2010) identify the best performing farms, by normalizing the scores per indicator on a scale from 0 to 100 (by using a linear approach). For each indicator 100 means a more sustainable performance (e.g. a higher net farm income, a lower antibiotics use or a lower mortality).

Subsequently the best performing group of 10 farms on the summed scores for all nine indicators were identified. Comparing the best performing farms (surfaces in figure 7) with the average of the other farms (black line) shows that a group of farms exist that outperform the other farms on nearly all sustainability indicators (for a few indicators no significant difference is found).

Figure 7. Sustainability performance of best performing farms compared to other farms
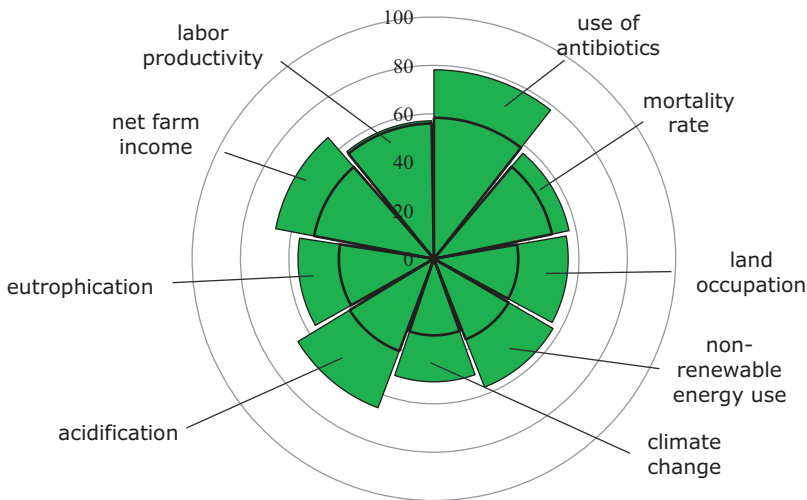
Source: Dolman et al. (2012).

The authors conclude that farm characteristics related to scale positively affect economic as well as environmental performance. Furthermore, a low feed intake and a feeding ration with a high share of wet by-products positively affect the environmental performance.

These examples clearly illustrate that integrated analyses provide advantages for analysing the trade-off and jointness of sustainability indicators. At the same time, the data is also very beneficial for farmers. Figure 8 shows an excerpt from a feedback report for farmers participating in the Dutch FADN. FADN farm feedback reports are extensively used for benchmarking, advise and decision making at farm level (Bradley and Hill, 2015). Extending the dataset with the sustainability performance indicators further increases the opportunities for benchmarking. Feedback on the sustainability performance of an individual farm does not only increase a farmers' understanding of the sustainability concept but also gives the opportunity for benchmarking, identifying improvement potential and thereby improving the sustainability performance of farms.

Figure 8. Feedback report for farmers in Dutch FADN, benchmarking of greenhouse gas emissions

Benchmarking: Green house gasses

Green house gasses	group average	farm nr
Emission (x 1.000 kg CO2-equivalents)	991	
Methane (%)	51	
NOx (%)	14	
CO2 (%)	35	
Manure (methane and NOx)	14	
SOIL (Nox direct and indirect)	12	
Energy use (CO2)	8	
contract work and other (CO2)	1	
Bought feeding stuff (CO2)	21	
Bought artificial fertilizer (CO2 en NOx)	5	
Other (CO2)	1	
Intestine Fermentation	28	
Emission per cow (kg CO2-equivalents)	11,982	

Type { Methane (%), NOx (%), CO2 (%) }
Source { Manure ... Intestine Fermentation }

Individual data hidden because of confidentiality

FLINT

Source: Dutch FADN.

3.5 Conclusions

This paper has described the change in data needs due to the change in societal concerns about agricultural production and its impact on agricultural policies and agricultural economics research. There is an increased demand for not only economic performance measures but also performance measures on planet and people indicators at farm level. The current set of agricultural statistics does not provide this type of information.

The FLINT project aimed at closing that gap by developing and testing a new data-infrastructure for the collection and use of a broader set of sustainability indicators at farm level. Such an integrated data assembly on micro level has large advantages for policy analysis and research. Reporting sustainability performance to farmers allows increased understanding and identification of improvement options. A harmonised way of sustainability measurement at farm level facilitates international comparison.

Some examples of the potential results show that there is not only a large dispersion in the economic results of farms but also in the environmental results. The analyses on the environmental performance of pig producers in the Netherlands and Dairy producers in Ireland show that there are important correlations between the economic and environmental performance of farms. The Dutch example shows that a group of farmers can be identified that outperform the other farms on nearly all sustainability indicators.

Dispersion in the economic results has often been used in the past as a starting point to benchmark farm performance and improve farm performance. Measuring sustainability performance at farm level offers similar possibility for benchmarking and improving environmental performance. A sustainability report for individual farmers provides an important starting point for increasing farmer awareness on sustainability topics and benchmarking of the sustainability performance.

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4. Economic and social context of current social policy in the Czech Republic

Abstract

The article deals with different impacts of social policy on the rural and urban population in the context of the socioeconomic transformation of Czech society. The authors attempt to compare current needs of the rural population in the area of social services with the goals of social policy in general. The socially excluded groups in the country, including the reasons for such exclusion as well as the influence of these groups on the development of rural villages, are defined. Further, social innovations are analysed with the objective of reducing or removing the existing exclusion of certain groups (e.g. the older generation, families with children, etc.). These analyses enable a better understanding of developmental processes in the Czech countryside and reveal the cultural factors affecting the current situation. Data collection is based on secondary sources, which are analysed by mathematical and statistical methods.

Keywords: rural society, social innovation, social policy, Czech Republic.

4.1   Introduction

Effective social policies of each state stem from the synergies between its economic and social assumptions. Justified and unjustified demands of different social groups are based on the possibilities of the State envelope, in general, the shared consensus on what should and should not be the content of social policy, and the bargaining power of trade unions and other institutions. After 1989, the gradual change in the paternalistic attitude of the State towards citizens in terms of social consumption shifted to regions, communities, families and individuals. In the Czech Republic, like most European countries, there are differences between the social structure of urban and rural areas. This in turn affects the range of the cost of social needs. The age and educational structure of the rural population are differentiated primarily by the size of the village, which (according to its possibilities) has a narrower or wider range of social services. In the worst case

scenarios, again related to the size and remoteness of the site, social services are completely absent. After entering the European Union, social policy options widened. Structural Funds are focused on key areas of regional development, including rural areas. Although there are new emerging social issues, there are also additional possibilities of tackling social issues. Social entrepreneurship and social innovation are also found in the EU 2020 Strategy (EC 2010).

In particular, areas of lower population densities cannot be developed without the external support of innovation, because there is no economy of scale in the provision of public and private services (Blazek, Uhlir 2002). An essential prerequisite for applying social policies in the countryside are institutions and the institutional framework. The documents themselves in the CAP and structural policies encourage their emergence, namely the emphasis on a bottom-up approach and processes associated with social inclusion. However, support from the staff of central authorities (e.g. the ministries or local government bodies at a higher level) is not strong (Dwyer, 2007).

Also ensuring equitable access to economic, social and environmental resources is essential for a thriving society, largely preventing the de-institutionalisation and desocialisation of production models applied in practice (Touraine, 2002).

4.2   Socioeconomic features of the Czech countryside

4.2.1. Demographic situation

The Czech Republic has been divided into 14 higher self-governing units (HSGU) since 2000. According to EU methodology, the new regional division includes 6 predominantly rural and 2 predominantly urban categories – see Table 1.

Table 1. Czech countryside according to EU 2014 methodology

Type	Area	Population	Regions
Predominantly rural	48,0 %	33,0 %	6x
Intermediate regions	37,0 %	43,0 %	6x
Predominantly urban	15,0 %	24,0 %	2x

Source: Ministry of Agriculture – Green Report 2014.

This methodology is based on the limit value of 300 inhabitants / km^2 , while OECD methodology takes into account the value of 150 inhabitants / km^2, which would mean that, in the category of predominantly rural, only 1 HSGU (Vysočina Region) is found. Another definition used by the Czech Statistical

Office (CSO) is the limit of 2000 residents / municipality. According to the authors of the article, this latter criterion permits a more detailed comparison of the development of the rural population – see Table 2 – because it eliminates the observed indicators of urban centres in regions predominantly rural.

Table 2. Rural villages in CR according to population

Population in village/year	2001		2008		2014	
	Villages	Citizens	Villages	Citizens	Villages	Citizens
Up to 99	548	38 881	518	36,512	458	32 649
100 – 199	1 113	166 214	1 048	155 578	997	148 036
200 – 499	2 041	663 416	2 024	660 126	2 001	651 677
500 – 999	1 280	893 592	1 312	922 543	1 369	962 432
1 000 – 1 999	652	903 757	692	962 615	745	1 038 124
Total rural	5 634	2 665 860	5 594	2 737 374	5 570	2 832 918
Total CR	6 258	10 230 060	6 249	10 381 130	6 253	10 512 419
Rural in %	90,0	26,1	89,5	26,4	89,1	26,9

Source: Ministry of Agriculture – Green Report 2014.

The proportion of rural population has been increasing since 2001. This may indicate the attractiveness of life in the Czech countryside. This increase of the population, however, does not apply to municipalities of up to 500 inhabitants. They are generally faced with a lack of basic amenities (Bernard, 2011), and also complain about the implementation of social policy in this area. The unattractiveness of small municipalities, associated with an inferior quality of life, is also reflected in their gradual disappearance.

Like the entire Czech Republic, the countryside is suffering from an aging population. However, it is necessary to mention that the urban areas are currently aging faster. The main factors for this include a higher fertility rate in the country, positive net migration and a higher mortality rate associated particularly with the character of cardiovascular disease within the rural population. The exception is again villages of up to 500 residents — where the population ages faster (CSO 2009, CSO 2014). But we can not say that the aging population in rural areas represents fewer problems than in the cities. Quite the contrary, this phenomenon can cause destabilisation of one of the key sectors of rural areas i.e. agriculture. The age structure of farm workers is a problem, not only in this country but also in most European countries. For example, in 2014 the agrarian sector in the Czech Republic showed the highest proportion of workers aged 45-59 (43,8%), followed by the categories of workers aged 30-44 years (34,5%). A lower proportion of workers fell into the youngest category of 15-29 years

(12,4%) and the oldest workers were aged 60 years and older (9,3%). This state has a long-term tendency to aggravate the situation (Green Report, 2013, 2014). According to numerous studies, if the situation does not improve (not only in the Czech Republic), the following issues arise: reduction of innovation potential; no natural generational replacement, resulting in the loss of know-how; the labour market will have decreased employment opportunities or hinder the diversification of business activities (Pinto-Correia *et al.*, 2015; Sutherland *et al.*, 2015). All these negative consequences have subsequent consequences in social policy. Costs will be increased to address the negative impact of the destabilisation of the agrarian sector.

Another problem is presented in Figure 1, which shows a direct correlation between the growing number of village inhabitants, and the proportion of the population with higher education. This problem is mainly related to the characteristics of the labour market. In rural areas, there is not a high demand for skilled workers, and therefore the more educated part of the population leaves to work in the cities. The exception are rural municipalities with good access to major cities or lying on the outskirts of large cities.

Figure 1. Size of municipalities and educational level of population in % 2011
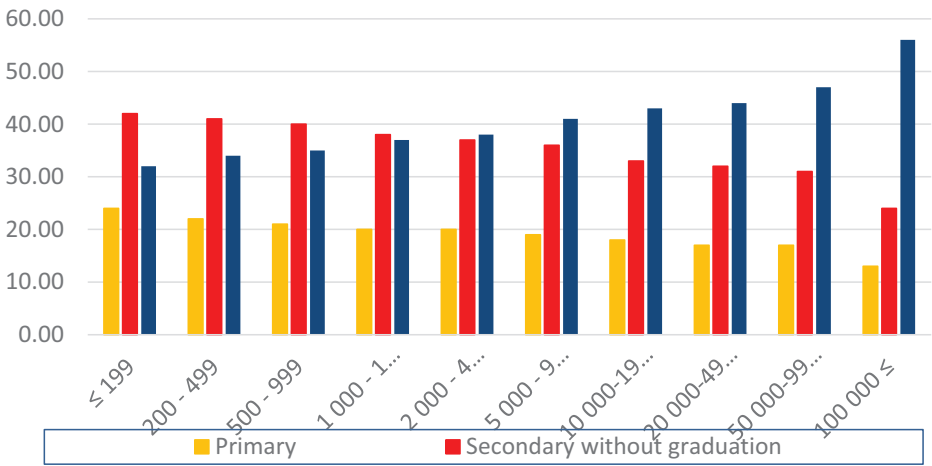
Source: CSO, (2011): Educational level of population according to the census.

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4.2.2. Economic situation

The difference in economic activity between rural and urban areas is not great and it is still true that most farm workers come from rural areas — see Table 3.

Table 3. Economic indicators in rural and urban spaces (2014)

Region	Economic activity	Employees in agriculture	Unemployment rate	Applicants / 1 free workplace
Rural	47,9 %	62,8 %	6,8 %	13,3
Urban	49,0 %	37,2 %	7,6 %	7,9
Total	X	100.0 %	X	X

Source: Ministry of Agriculture - Green Report 2014.

The unemployment rate in the countryside ranks lower in comparison with cities, but this indicator is not considered individually. When studying Table 3, it can be seen that there are almost twice as many job-seekers for every 1 vacancy. A long-term comparison reveals that the job-seekers from rural areas account for approximately one-quarter of all candidates, while job vacancies in the countryside constitute only one-sixth of all jobs. The lower unemployment rate in rural areas is primarily associated with a higher proportion of people commuting to work outside their municipality of residence (Green Report, 2014). Job-seekers in larger cities, coming from rural areas have lower average incomes (compared with the urban population). Therefore, they can achieve a certain competitive advantage, because they do not require high wages.

The above-mentioned income disparity also influences the wage level in the agricultural sector. Agriculture does not require a higher educational level, which is related to the fact that most workers in the sector are employed in manual labour. According to the Classification of Occupations (CZ - ISCO), the occupational structure of the sector in 2014 was as follows: 37,2% comprised skilled agricultural workers, 23% operated machinery and equipment, 11,0% technicians and skilled workers, 7,4% unskilled workers, 7,2% craftsmen and servicemen, 4,3% civil servants, 3,5% managers, 3,2% specialists and 3,1% workers in sales and services (Green Report, 2014).

The wage disparity of agriculture (including forestry and fishing) compared to industry remains unchanged at 81,0%. Sessional wages in the total economy increased by 0,3 percentage points to 82,2%. The increase in the absolute deficit in average wages in agriculture compared to industry is unfavourable – it has reached almost 5000 CZK (4966 CZK). Towards the national economy it remained practically unchanged (increase of CZK 23 to CZK 4569) (Green Report, 2014).

Despite the above, the question arises as to what other factor could act to decrease the unemployment rate in the countryside? The impacts of social policies in rural areas are also offered in response. If we know e.g. the housing allowance mainly covers the current costs of housing, but does not include future costs associated with the maintenance of residential units, this position is inadequate in the long term for the rural population. The proportion of the rural population owning a residential unit (flat or house) is higher in comparison with the urban population. The maintenance of this type of housing requires extra expenditure (hundreds of thousands of crowns) in the long term. Owners of residential units are, therefore, more motivated to search for long-term income e.g. in the form of employment or business activities, instead of relying on social assistance.

4.2.3. Facilities in villages

Generally, the facilities of each municipality decrease with diminishing size and the degree of difficulty of operations. Again, in a village of up to 500 inhabitants there are not sufficient resources to improve the facilities. Larger municipalities can ensure services such as a library, kindergarten and primary school. As far as facilities are concerned requiring a higher skilled workforce and implying high financial costs, including claims on the technological infrastructure, the majority of the rural population no longer has any choice but to commute to larger centres. But even commuting is not a solution without difficulties. The biggest problem is the commute for groups of people reliant on public transport e.g. children, the elderly, the handicapped and all those who do not have the necessary means of transport (one car in a family of four members may not be sufficient). For these groups of people, if the question of public transport is not resolved, it leads directly to the exclusion of the wider labour market, of social life and separation from other essential services (health services, education, shopping, etc.).

At present, average facilities in rural municipalities are in these proportions: library (76%), kindergarten (48%), elementary school (36%), general practitioner (24%), paediatrician (17%): number of places in nursing homes per 1000 inhabitants (7,1) (Diary of Municipalities 2010; CSO 2014b).

The above facts and others have an impact on the differing needs of the population living in cities and in the countryside, which should also be reflected in the applied social policy here.

4.3   Social policy in CR

Social policy in the Czech Republic includes a number of aspects — economic, social, ecological, political and more. Generally, it can be defined as "a set of activities that specifically aims to improve the basic living conditions of citizens." (Nosková, 2013).

Changes in social policy after 1989 affected both the form and content of the individual parts of social policy. Before 1989, there was a long-term care provision in Act no. 20/1966 Coll. People's Health, which, with minor modifications, lasted until almost recently. Some areas of healthcare, however, were modified to sub-standards, for example Decree no. 242/1991 Coll. on the system of health facilities established by district authorities and municipalities.

In the area of social assistance, 1988 legislation was adopted, which provided a framework of social benefits and services. It was also a law on the competence of social security and subsequently implemented a Decree for those laws.

Changes in 1989 concerned the recognition of the needs of specific training for social workers and of following the concept of the Social Services Act. Another important step was the transfer of competencies in the area on the local level and the input of NGOs in this area. The Czech Republic is unique in that it has had a valid Social Services Act (Act no. 208/2006 Coll.) since 2007, unlike many partner countries. And it also has the implementing Decree (Decree no. 505/2006 Coll.), which significantly contributes to improving the quality of the services provided. In this respect, the Czech Republic reported to the voluntary European quality framework for Social Services, which was prepared by the Social Protection Committee of the European Commission (Nosková, 2013).

Changes after 1989 have had an impact mainly of a structural nature. Otherwise, they are perceived and accepted from a generational perspective, from the perspective of educational groups, the territorial division of the State, the economic activities of the population and other factors. Among the most significant changes are the retreat from egalitarian, redistributive attenuation elements and an emphasis on individual responsibility of the individual person. The unified model of social policy can not cover all the needs and requirements of the population and should be modified according to the urgency, purpose and possibilities of the State.

In principle, it is based on fundamental principles, which are social justice (division of sources and equity before law — equity of opportunities), social solidarity (mutual support, belonging of persons, units and organisations, social solidarity has the moral dimension), subsidiarity (the person has unique features and skills, which are protected by society), participation (the human user is not a passive participant, but participates in the organisation of his/ her own as well as community life).

Some social benefits relate to the whole population (e.g. education, healthcare, social contribution, social services, etc.). Others are targeted at individuals and social groups with higher or special needs (the unemployed, the elderly, lonely father or mother, handicapped persons, etc.).

Some of the most important current issues concerning all residents include the financing of long-term care issues and the transformation of care. Both sets of questions, however, are intrinsically linked, because in these areas it is very difficult to find a balance between a State-guaranteed level of meeting the needs of citizens and the adequacy of costs incurred for specific services (Nosková, 2013).

From the territorial aspect, we can discuss the specific needs of rural areas, concentrating on some unfavourable conditions for the lifestyle needs of the population and the provision of social services. Quite naturally, a growing differentiation creates pressure to resolve social problems and often becomes political capital.

4.4   Social exclusion and inclusion

Especially after joining the EU, concepts such as social exclusion and social inclusion have become buzz words. They are dealt with in numerous programme documents of the EU, which are influenced by the social policies of individual member countries. Mareš and Sirovátka state that there are many definitions of social exclusion, out of which we can present a definition which represents the general extended concept of the European Union of social exclusion. This definition defines socially excluded individuals as "residents / citizens of a society, who for reasons that they themselves control, cannot participate in regular activities to which they are entitled and aspire due to their citizenship" (Burchardt, Le Grand, Piachaud, 1999). This definition implies a social system – there is desirable for individual person to be integrated (they have the status of equal citizens in such society) (Mareš, Syrovátka, 2008).

Social exclusion and inclusion have several dimensions (e.g. economic, social, ethnic, religious, political, etc.) which may be conditional, amplified and mutually interconnected. Socially excluded persons and groups usually have some of the same individual and group characteristics expressed by economic indicators (income level, housing quality, access to resources and services, etc.), and by social indicators (level of education, level of disability / autarchy, involvement in communal activities, cooperation in the municipality, frequency of communication among various social groups in the municipality, existence and frequency of misunderstanding among social groups, rate of non-assimilation and neglect of the rules of communal life in the municipality, etc.).

Socially excluded localities originated in the Czech Republic and their number is still growing. Currently there are more than 400 localities – see Picture 1.

Picture 1. Map of socially excluded localities (2013)
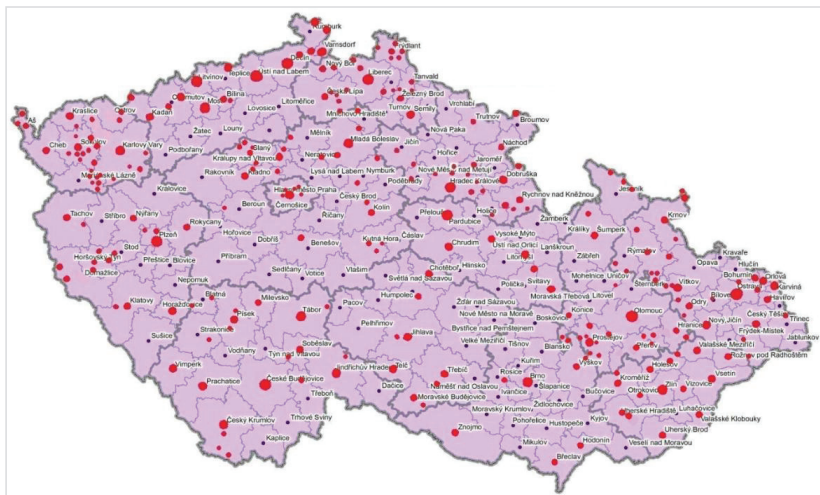
Source: ČÁP Petr, Agentura pro sociální začleňování: Sociální začleňování v CLLD s ohledem na synergie OP v ESIF 2014-2020. Dostupné online na:
[http://nsmascr.cz/content/uploads/2014/10/prezentace_ASZ.pdf.], [cit. 10.1.2015].

An epiphenomenon and logical consequence of life in excluded localities is poverty. Poverty denotes the social status of people who suffer from material deprivation. However, it is necessary to mention that the Czech Republic is among the countries that are a threat in terms of poverty of population in balance. On the other hand, the dynamics of the economy and employment in rural areas, especially in small municipalities, suggest that poverty may be a problem in the future, especially for the aging population in small villages (Programme of Rural Development, 2014-2020).

Forms of poverty and methods of measuring poverty in different countries are variously defined (absolute poverty and relative poverty, objective and subjective poverty, etc.). In European comparison, the Czech Republic is among countries which have a lower standard of living than Western European countries, but among post-socialist countries (together with Slovenia), is faring the best. Their standard of living is higher than in Portugal and Greece, although these countries became EU members over 30 years ago – Figure 2.

Figure 2. Poverty in EU Countries (2014)

The limit of poverty in PPS (Purchasing Power Standard) 2014 PPS
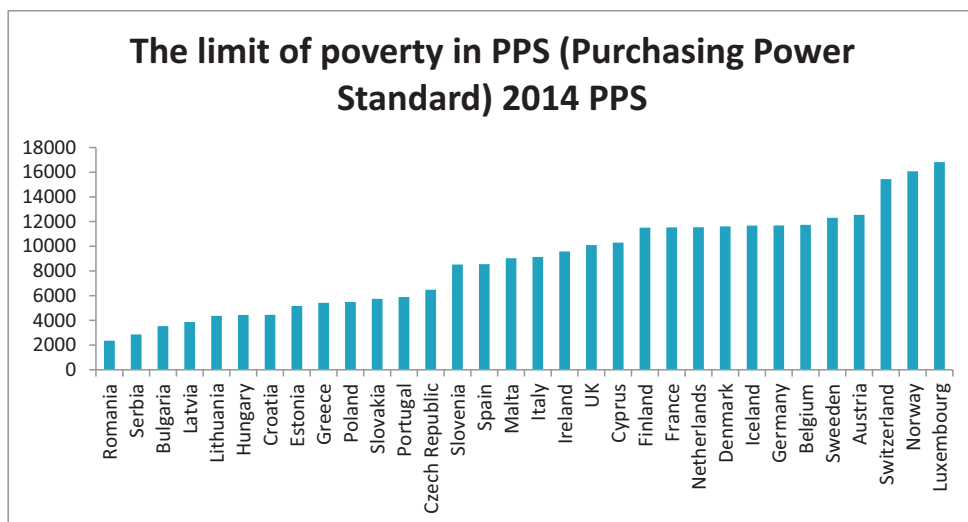
Source: Eurostat – statistics of income divison (statistika příjmového rozdělení)
(http://ec.europa.eu/eurostat/statistics-explained/index.php/Income_distribution_statistics/cs)

One of the measures could be based on the statistical data, but another aspect is a subjective feeling of poverty in the population. Approximately 36% of Czechs describe themselves as poor; among them the unemployed (63%), manual workers (52%) and retirees (42%)[13]dominate.

The subsistence minimum is a socially recognised minimum income category; defining the poverty line is a socio-political convention. So the question is whether the construction of subsistence corresponds to the state of society in a given historical period. In a representative survey of households conducted by the STEM agency, the question was posed to examine the poverty line households. The reported amounts are very diverse (average CZK 10 890), but remarkably coincide with the official rate of subsistence for the family type (CZK 10 830). Various socio-demographic groups of people coincide well with the estimation of poverty, which means that the poverty line is a generally accepted normative vision.[14]

4.5   Social innovation and social entrepreneurship

Limitations to the content and quality of resources in rural and urban areas are mentioned in all known theories of regional development. Currently, it does not become important only to look for new sources, although they play their es-

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[13] https:// www.stem.cz/tag/chudoba
[14] https:// www.stem.cz/tag/chudoba

sential role in rural development, but also for new ways of using the already well-known sources. New solutions (product, service, model, market or process) to improve the functioning of society or remove the problems in the existing EU may be called the concept of "social innovation". In this case, however, it is not a technical innovation in the sense of Schumpeterian creative destruction. Therefore, a business activity based on the concept of social innovation shows significant differences. A social enterprise is a business with primarily social objectives, while economic profit is primarily reinvested in the business for the same purpose or for the development of the local community (Defourny, 2006). If a company comes up with new solutions, it is necessary that the business has not much obstacles, regardless of whether it is a social area or not (The Young Foundation, 2012).

The rural areas compared to urban environments suffer from rigidity and an unwillingness to embrace new ideas. However, this may change due to the aforementioned migration from cities to the countryside. Entry into the branch represents another barrier to social entrepreneurship in the countryside. Social enterprises are lacking e.g. funding for their operations – from the perspective of banks, these companies appear unattractive in towns where we can expect an increased demand for their services and products. It is therefore even harder for businesses in the countryside to prove sustainable in the long term – in this environment there are mostly small-scale and not broad-scale activities. The evaluation of the benefits of social enterprise also appears to be a very problematic factor, because market forces require results in a tangible economic form.

Another problem arises in the case of social innovation which are of successful functioning. Because then there is always the question of how to ensure growth and the transferability of new ideas to other locations as well. Regional science in particular points out that a simple copy of the original procedures and solutions in different environments can be problematic, due to the non-identical characteristics. Particulary the State and its government has sufficient financial resources including key responsibilities for social policy. Therefore the State should always play a dominant role in the dissemination of innovative ideas in the social sphere to other localities (Malik-Housová et. al., 2013).

In the Czech Republic, the focus of social enterprises is dominated by the following areas: equal opportunities (182x), social counselling and assistance (122x) and the development of local communities (119x). Other aims, e.g. culture and the environment there are not more than 60 companies. In the CR, the main target groups of social enterprise are: disabled (135x); long-term unemployable (67x); young people in difficulties (30x) and ethnic minorities (25x) (Vyskočil, 2014).

Although social enterprises predominate in the cities (2/3), from the above objectives and target groups it is clear that their activities can be very beneficial for solving the problems of the rural population. LAGs (Local Action Groups) represent the key organisations to deliver support to social entrepreneurship and innovation in the countryside. Those related in their strategic documents to the Leader 2006-2013 and CLLD 2014-2020, are directly obliged to declare themselves to support innovative development in rural areas, which is not possible without the financial support also provided by the State through its social policies. These resources can not be regarded as sufficient, hence there is the need to seek funding in the context of other policies (e.g. CAP and Structural Policy).

In cities, the situation is easier in terms of the demand for social services — social entrepreneurs have a geographically concentrated demand there. However, a lower degree of social control in those areas leads to abuse of all forms of social assistance. It can again be concluded that social policy should also reflect the location from which the target group comes.

4.6 Conclusions

The transition from a paternalistic state to a state which does not operate all social assistance, is not and probably will never be completed. On one side, there is the debate about the extent of the State's responsibility for its citizens and for the responsibility of every citizen for him/herself. And on the other hand, conditions of life in our society are constantly changing, to which social policy must also respond.

The above facts show that the processing strategy direction of social policy must take into account not only economic, ethnic and health considerations, but also geographic criteria. If we resolve e.g. problems associated with the labour market, it is necessary to take into account whether it is a sparsely populated (rural) or densely populated (urban) area. If we evaluate e.g. the number of jobs in an area, this does not mean that they are lacking or always the same. In the countryside, this lack is compensated for by a higher proportion of people commuting to work outside their permanent residence, which, while ultimately contributing to lower unemployment rates in the countryside, also brings with it increased transport costs, loss of time and thus the weakening of ties to the area. Similarly, the required level of qualifications has different impacts according to the location. In the countryside, less skilled labour dominates. Therefore the educated population is leaving for the cities, thus impoverishing the countryside of intellectual capital. Less skilled labour results in lower incomes, which ultimately leads to the risk of poverty and social exclusion. Also, the age structure is dif-

ferent, depending on the location. In the case of rural areas, this can result in the deterioration of the age structure of the agrarian sector and, in the case of cities, destabilisation with the deterioration of intergenerational solidarity.

Social policy should also respect the organisational structure of the urban and rural populations. This "organic" solidarity (prevalent in cities), while increasing the quantity and quality of social assistance, can also cause pressure on the higher paternalistic state and thus result in higher expenditure from the state budget. On the contrary, what is called "mechanical" solidarity (typical of rural areas) on one hand, motivates people to be more accountable for their lives, but can also cause social exclusion, because social assistance is less available in those areas.

An effective method of dealing with this case is demonstrated by a social enterprise operating in the area and accurately reflecting the characteristics of the specific area. Such businesses do not only receive support for their business activities from the State, but LAGs also come into play here. These groups always direct their developmental activities towards their site, and therefore have the potential to eliminate the negative phenomena associated with the negative impacts of social policy or the social exclusion associated with the local population.

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5. Productivity Growth vs. Farm Support in EU Agriculture – policy implications

Abstract

Productivity growth has been considered inevitable as the source of output growth for sustainable development of the agricultural production sector. Productivity based output growth has been considered more critical than input using output growth. The former is a cost saving and environmentally sustainable approach compared to the latter. This current study argues that the farm support policies of the Common Agricultural Policy (CAP) might discourage the improvement in agricultural productivity growth. Sustainable development of agriculture might face serious challenges if the current approach of keeping farm support programs continues in EU agriculture.

Keywords: productivity growth, farm support policies, Common Agricultural Policy (CAP).

5.1 Introduction

Productivity is regarded as an inevitable source of economic growth (Barro, Sala-i-Martin 2003; Färe et al. 1994). It expresses the changes in the efficiency of the entire economy, particular sectors and entities. Productivity is also major source of sustainable development in agriculture.

The literature review provides fairly diversified conclusions on convergence of agricultural sectors among the EU or global countries. This results from different concepts of productivity measurement, different time interval or various convergence indicators. Most of them support the existence of convergence processes (Ball et al 2010, Baráth, Fertő 2014).

Data as well as literature review show visible differentiations in the level and in the changes of productivity growth rates among EU countries for the past 15 years. Some authors like Hamulczuk (2015) show that there is no reduction of disparities in productivity among the EU countries, especially among old EU member countries. This observation makes us wonder why performances have been different among the EU member countries that have been under the same policy framework of the Common Agricultural Policy (CAP). This counter acting phenomenon in the process of the integration to a single market might be related to the shift in the emphasis of the CAP to rural development.

Roles of farm support policies, which have been widening the popularity, for productivity growth have not been well understood, especially for new EU member countries. This paper is an attempt to understand the relationship between farm policies and productivity growth for new and old EU member countries. Policy implications for Polish agriculture are also discussed. This current study examines the relationship between productivity growth and farm support spending for the EU member countries using national level data of 2000-2014.

5.2 Productivity and its interaction with policy

Productivity is defined as y/x, where y is output and x represents a set of inputs. Productivity growth is a key source for output growth. Productivity growth can be achieved through technological progress and production efficiency change. Technical progress is generated by the shift in production function (Figure 1.1). The role of public spending on technical progress has been considered important. Production efficiency improvement is shown as a move from A to B in Figure 1.1. Production efficiency is known to improve when production incentives increase and knowledge for production enhances. Agricultural and food policies can influence production incentives and producers' knowledge on agricultural and food production.

Figure 1. Pathway of productivity growth
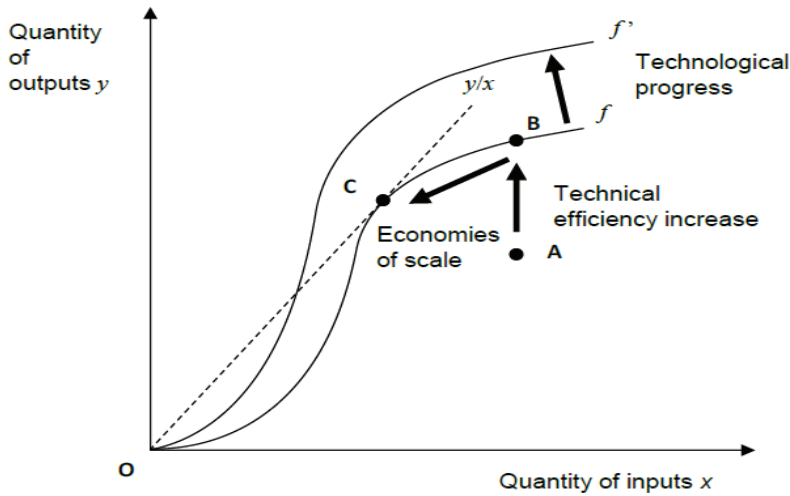
Source: OECD 2015.

Most theoretical studies suggest that subsidies may have positive impacts on farm production and at the same time negative impacts on farm productivity. There are various channels through which the agricultural support can affect production and productivity. We may list: trade effect, risk effects, land price effects, credit effects, labor participation effects or expectations effect (Banga 2016).

Empirical literature discovers mixed effects of subsidizes on farm productivity, mostly negative. Ferjani (2008) indicates that Swiss farms that receive greater direct payments are less efficient than other farms. Latruffe, Guyomard and Le Mouel (2009) also show that there is a significant negative relationship between managerial efficiency and CAP direct payments. The impact studies of decoupled payments on farm outcomes for the U.S. agriculture produced the observations that the decoupled programs distorted the producer behaviors. The coupled programs did not improve production efficiency and productivity in EU agriculture.

Kazukauskas, Newman and Sauer (2011) and Rizov, Pokrivcak and Ciaian (2013), however, suggest that the decoupled payments are less distortive and enhance productivity in comparison to coupled payments. The former study finds that specialization along with decoupling policy resulted in improvement in productivity in the farm level for the sample farms in Ireland, Denmark. Banga (2016) also proves the existence of a positive impact of the shift in policy tools from coupled payments to green box subsidies on TFP in EU agriculture.

5.3 Data and methods

To measure Total Factor Productivity (TFP) change, the TFP indexes based on Solow type growth accounting model were employed (Solow 1957). A production function is assumed to be in the following form:

$$Y_t = A_t F(N_t, L_t, M_t, F_t, S_t) \tag{1.1}$$

where: Y is Output, N – Land, L – Labour force, F – Fertilizer, M – Machinery, S – Livestock are inputs I. A is a Total Factor Productivity (TFP) being residuals from the production function F which assumes constant return of the scale and untouched marginal rate of substitution. Production function assumes also neutral technical change.

If we totally differentiate the analyzed production function with respect to time, then divide both sides by Y_t and rearrange obtained equation we get:

$$\hat{Y}_t = \hat{A}_t + MP_N(N_t/Y_t)\hat{N}_t + MP_L(L_t/Y_t)\hat{L}_t + MP_M(M_t/Y_t)\hat{M}_t +$$
$$+ MP_F(F_t/Y_t)\hat{F}_t + MP_S(S_t/Y_t)\hat{S}_t \tag{1.2}$$

where: (^) indicates instantaneous growth rate, MP_i are unobservable marginal products of particular inputs I_i.

Let's assume perfect competition where producers maximize profit and employ each input at given prices. So marginal product of input MP_i equals its real factor price P_i (Solow 1957, Suphannachart and Warr 2010). So replacing marginal products with factor prices equation 1.2 can be rewritten as:

$$\hat{Y}_t = \hat{A}_t + w_N\hat{N}_t + w_L\hat{L}_t + w_M\hat{M}_t + w_F\hat{F}_t + w_S\hat{S}_t \tag{1.3}$$

where: $w_i = P_i I_i/Y$ are shares (weights) of inputs income in the value of total output. In other words, w_i are production elasticities or cost shares of individual inputs under assumption of Cobb–Douglas function. In our research the weights were not originally estimated, but were taken from Hayami and Ruttan (1985). It is worth adding that calculations of TFP indexes were performed using logarithmic data (natural logarithms).

As at is residual, it covers both wanted as well as unwanted components. The second type of changes covered via residuals are measurement errors, omitted variables, aggregation bias and model misspecification. The main criticism is addressed to the assumptions of the Solow model: constant returns of the scale, competitive market and marginal cost pricing, as well as equal shift of function

at different combinations of inputs. These may influence obtained results in systematic way (Hulten, 2001).

To calculate TFP growth rates, FAOSTAT data were used. The data for 24 EU countries cover the period of 2000-2014. Croatia, Cyprus, Malta and Luxemburg were excluded from the studies due to the existence of missing data or small significance of economies. The annual data at the national level were aggregated and covered output (net production value expressed in real USD and adjusted by purchasing power parity) and five inputs expressed in physical units (land, labor, fertilizers, machinery, and animal stock).

To estimate relationship between TFP change and agricultural support also data from Eurostat Economic Accounts for Agriculture (EAA) expressing farmers support were used. Subsidies (sum of subsidies on products and other subsidies) were expressed per output as well as per employed in agriculture (AWU).

5.4 Productivity growth in the EU agriculture

The growth rates of TFP for 24 EU countries were calculated with the use of residuals from Solow model. The obtained results are presented in Figure 2. In the analyzed period we can observe quite diversified paths of TFP development. The highest growth of TFP is observed in Romania, Estonia and Slovenia. The worst performing country with respect of TFP is Greece where its level has decreased by 10%.

Figure 2. TFP indexes for selected EU countries
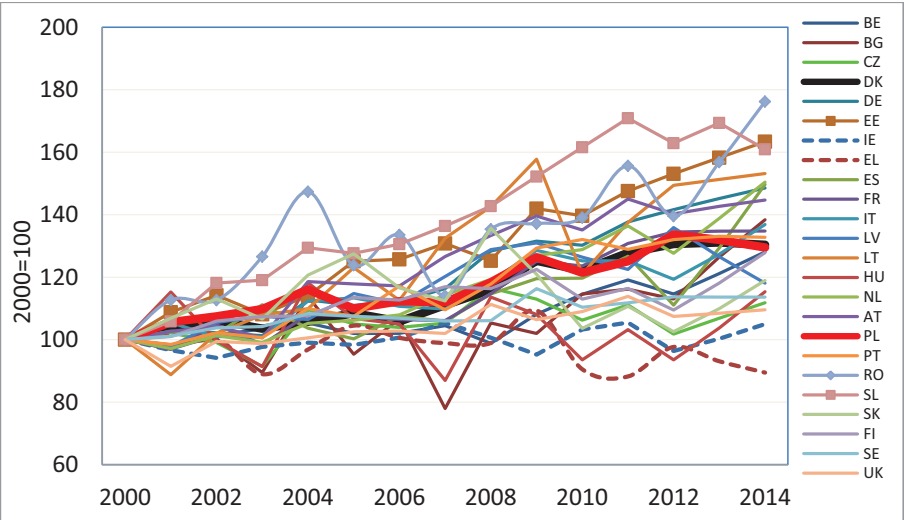
Source: own elaboration based on FAOSTAT data.

Figure 3. Average TFP indexes for the OMS and NMS
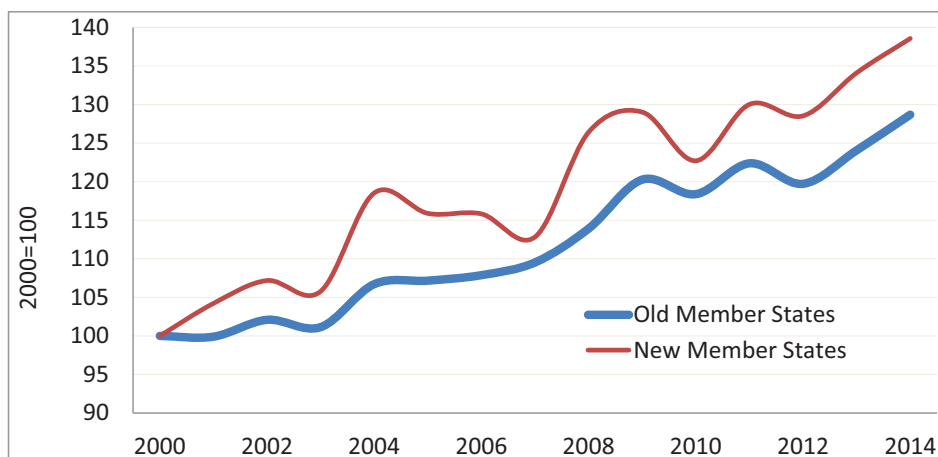
The average TFP growth rates in the old member states (OMS) and the new member states (NMS) are presented in Figure 3. We can see that the productivity in the NMS is growing faster than the productivity in the OMS. This may suggest the existence of beta convergence processes as the initial productivity in the MNS is lower than that in the OMS. This hypothesis is supported by the work of Baráth and Fertő (2014) where DEA method and Lowe TFP indexes were applied. Overlapping of the peaks and troughs suggests that the changes of productivity in both groups are linked each other. Co-movements of TFP indexes in the NMS and OMS might be an indication of so called stochastic convergence (Bernard and Durlauf, 1996).

5.5 Agricultural support vs productivity

To estimate relationship between agricultural support and TFP growth we regress TFP change on the sum of agricultural support in a given period. Two time frames were analyzed: 2000-2014 and 2005-2014. The subsidies were taken in nominal values (first case) or they were adjusted by Purchasing Power Parity (second case).

**Figure 4. Farm support in relation to Output vs TFP change
in 2000-2014 and 2005-2014**
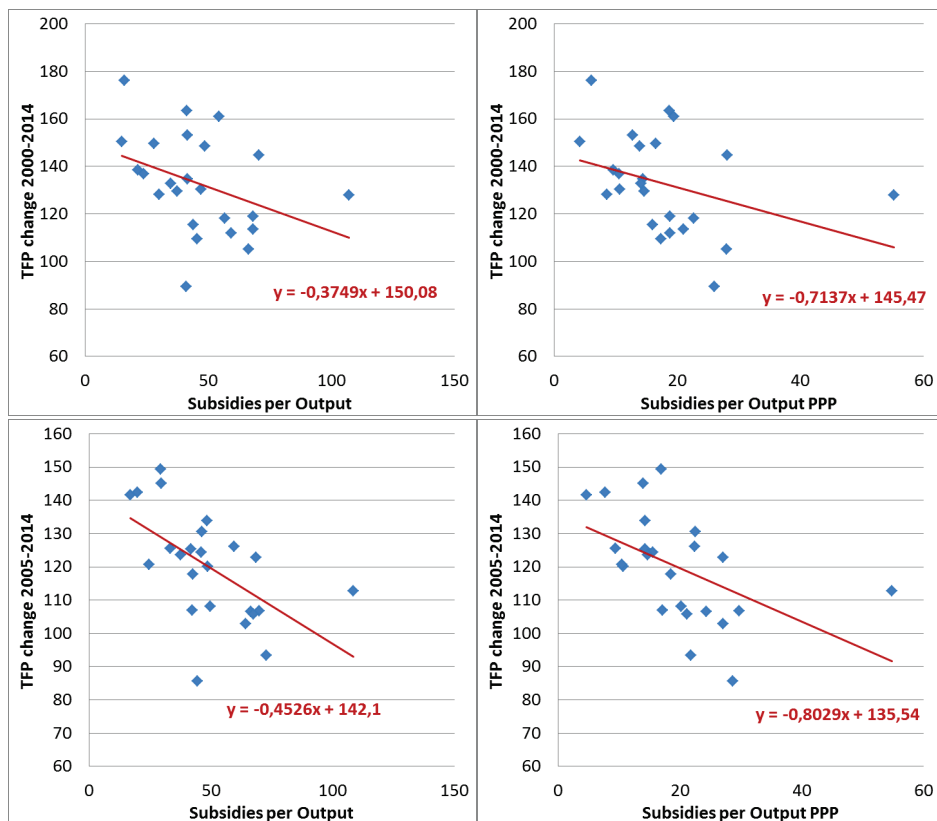
Source: own elaboration based on FAOSTAT and EUROSTAT data.

Figure 4 presents association between productivity growth in the UE and farmers' support normalized with respect of output. Negative signs of regression might be regarded as indicators of negative impact of farm support on productivity growth in the EU countries. The concussion is the same in both periods (however, more significant coefficients are estimated for 2005-2014). Adjustment of independent variable by PPP also doesn't change this statistical result. The estimation results are slightly underestimated due to outlier observations (Finland – the point with the highest subsidies per output and Greece – the point with the lowest TFP change). Removing these points form the sample leads to obtaining more significant and more negative relationship between TFP growth and subsidies per output.

Figure 5. Farm support per Employed vs TFP change in 2000-2014 and 2005-2014
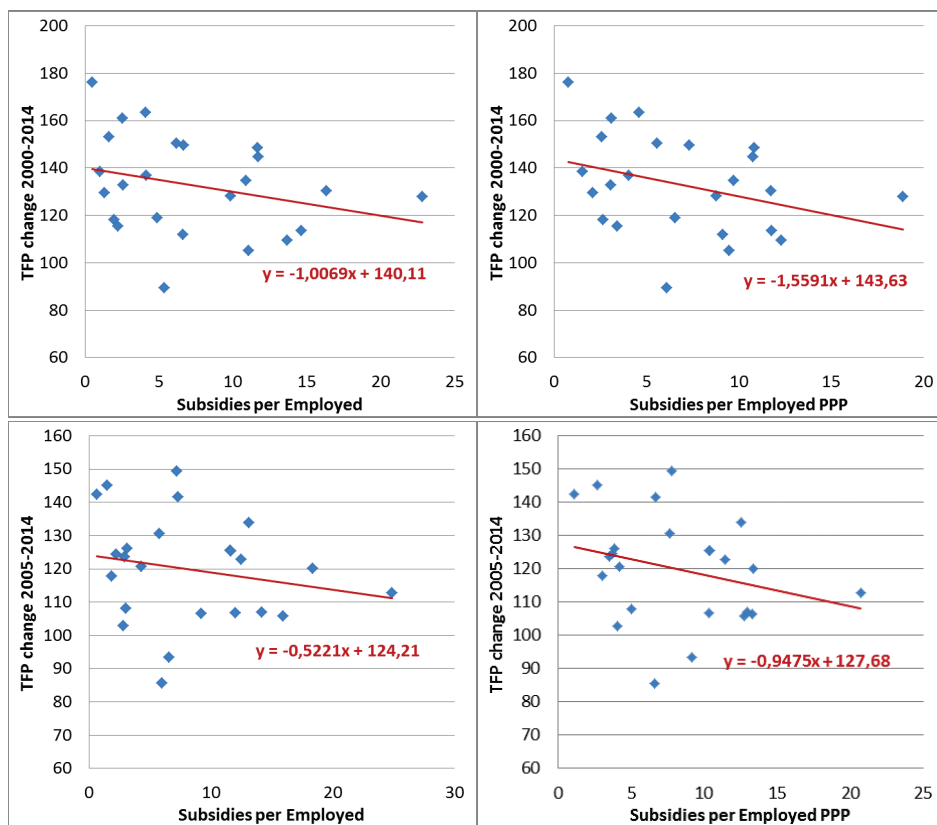
Source: own elaboration based on FAOSTAT and EUROSTAT data.

In the next step the relationship between TFP change and subsidies per employed (AWU) were considered. Figure 5 presents results of our investigation. A negative correlation between both variables is visible – however it is not as strong as in the previous case (support per output). P-values of the estimated coefficients for 2000-2014 are 0.18 (nominal) and 0.11 (PPP adjusted) whereas in 2005--2014 are even less statistically significant (p=0.35 and 0.19 respectively).

5.6 Conclusions

The economic theory suggests several possible mechanisms through which farm payments might influence production efficiency and structural change in agriculture. TFP growths in the analyzed period were highly volatile and diversified among EU member countries. TFP growth rate was higher in the NMS than the OMS. Convergence of the two groups was observed. The performed analysis indicates that TFP growth is higher in less supported countries.

Farm support policies might not be effective for productivity growth in agriculture. A policy implication to Polish agriculture is the potential harm done to long-term sustainable development of Polish agriculture when support programs continue to exist. Productivity growth might take place at a slower pace than the EU member countries with less support in the long-run.

Future empirical work should involve application of panel data and models, and micro level analysis based on FADN data to examine the real reactions of individual agricultural producers for a specific country such as Poland.

If demand is inelastic, as typically the case for agricultural and food products, the shift in supply, created by productivity growth, will decrease producer surplus and increase consumer surplus. Most benefits of productivity growth go to the hands of consumers. For the social welfare, measured as the sum of producer surplus and consumer surplus, we will observe a net gain. The relationship between productivity growth and farm income will need to be studied. This type of study will be useful to understand the effectiveness of structural and modernization policies.

The situation will be different if we can promote agricultural and food products with elastic demand. Policies to differentiate products, such as geographical indication (GI) certification programs, can induce gains to producers in response to productivity growth.

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6. Evaluation of projects from Rural Development Programme in the Czech Republic

Abstract

There was more than 3.1 billion EUR approved for Rural Development Programme in the Czech Republic (RDP) for the programming period 2014--2020. It is necessary to spend the finances efficiently and hence to select quality projects for support. The aim of the article is to describe the methodology of project evaluation, the procedure for calculating key indicators, and the creation of the databases of materials for project evaluation. Cost Benefit Analysis (CBA) was decided to be the most appropriate method for the evaluation of projects finance within the RDP framework. The method compares the benefits and detriments of the projects. Databases and predictive models developed by IAEI were used to quantify these impacts.

The result of the work is a comprehensive database of annually recalculated inputs, presented in time series for the whole programming period 2014--2020. So far, a simplified CBA model was developed, which relies on the financial analysis of projects and is linked to a database of materials. It is currently used for the evaluation of applications for subsidy under measure M6. CBA is complex method, where the quality of outputs is directly dependent on the availability of all needed data. Therefore, more sophisticated version of the model is being prepared. Beside the expansion of the database of materials for financial analysis, it will include also the database of valuated externalities.

6.1 Introduction

Common Agricultural Policy (CAP) has always been one of the most important policies of the European Communities, especially because being common and in financial terms as it currently represents almost 40% of the EU's budget). From its inception in the 1950s, it has experienced a series of reforms. There was a shift from orientation on the production to environmental issues and rural development. In 2003, the Fischler Reform brought "decoupling of a large share of the CAP from production into a 'single farm payment' (SFP), and introducing modulation (where funds were shifted towards rural development) and

cross compliance (where only farmers adhering to a set regulations relating to the environment, animal welfare, livestock identification and traceability, plant protection and food safety were eligible to receive the SFP)" [Barnes et al. 2016]. To more justify income supports for farms, the most recent reforms in 2015 added new 'greening requirements', shifting further the new CAP towards the enhancement of the production of public goods. It has evolved to comprising two parts: Pillar 1 and Pillar 2 [Slee and Feliciano 2015]. Pillar 2 comprises the Rural Development Programme (RDP), where there are explicit measures to support not only production function of the agriculture, but also the creation of positive externalities and public goods.

Based on the European Parliament regulation, the granting of more than 3.1 billion EUR was approved for the RDP in the Czech Republic for financial period 2014–2020. The financial frame of the RDP was enlarged by the transfer of 30 milion EUR (2015-2017) of the Pillar 1 finance. Majority of finances are devoted to environment protection 64.2% and competitiveness of agriculture (17.0%). The allocation of the finance among the mentioned priorities has been a consequence of more analyses and political discussions. In any case, those finances should be used efficiently and effectively.

The evaluation process of the projects to be financed from the RDP should take into account not only the economic side of the projects, their profitability, viability and effectiveness, but also the social point of view. It is necessary to select quality, efficient and effective projects for support which would not have negative influence on public welfare, but more preferably produce positive externalities. Therefore, the Cost Benefit Analysis (CBA) is recommended to be used for evaluation and selection of the "large" projects financed from the RDP (see Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 and Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013). CBA became an official method to evaluate the outcomes of structural and cohesion policy of the EU in 2000. In the context of RDP, it is especially suitable to evaluate the investment intentions within the measures M4 – Investments in tangible assets, M6 – Development of holdings and business activities, and M16 – Cooperation. CBA does not take into account direct impacts to overall balance of national economy, but the essence is to analyse the impacts of individual projects on farm investments on all affected stakeholders and transform it to the financial form. The method takes into account all the benefits that express any positive effects and detriments of the project. CBA measures inputs and outputs in monetary units which is its main advantage and disadvantage. It understands the bene-

fits as every increase of the utility and costs as every decrease of the utility, what is sometimes hard to be determined in monetary terms.

Two variants of a future situation are compared: null and investment variant. The evaluation has to foresee the future alternative development of variables with and without the project. There are also issues with the evaluation of the externalities whose value is highly dependent on the applied valuation method. Hence, the results of the complete CBA are highly dependent on knowledge of the planner. "The selections of the applications for a subsidy from the RDP had not taken into account complete CBA yet and the prices of certain externalities which are related to the projects are unknown yet" [Pechrová 2016]. Currently the Ministry of Agriculture of the Czech Republic (MoA) uses the RDP Model Calculator (a simplified version of Cost benefit analysis) to select the projects aimed at diversification on farms. It evaluates primarily economic effects of the projects.

The evaluation of the whole RDP can be viewed from more sides. For example Slee and Feliciano [2015] searched for the indicators that would assess the impact of the Scotland Rural Development Programme 2007-2013 on climate change mitigation. Regarding the Czech RDP, for example Ratinger et al. [2013] evaluated the effects of investment supports to agricultural modernisation. Medonos et al. [2012] focused in particular on the assessment of economic and other effects of Measure 121 – "Modernisation of Agricultural Holdings" of the Rural Development Programme 2007-2013. The aim of this article is to describe the methodology of the evaluation of RDP investment projects within the financial period 2014–2020. The RDP calculator for CBA and its input data (databases of sources for project evaluation) and the procedure for calculating of the key CBA indicators is further presented.

6.2 Methodology

The article is developing a model of financial plan. Needed data are either gathered by Institute of Agricultural Economics and Information (IAEI) or obtained from the Czech Statistical Office (CZSO). Databases and predictive models were developed in order to implement them into the CBA analysis that should be used by MoA in the process of project selection in the future.

CBA is a suitable method when there is an intervention planned (in our case the project). It takes into account all effects which the project can bring and their impact on stakeholders. The method is trying to express all benefits and detriments of the project and valuate them in monetary units reflecting their social values. The aggregation of all monetized costs and benefits is expressed in time to reflect social time preferences. CBA compares the future alternative development of project variables in two situations: with and without the implementation of the project. There-

fore, the CBA limitations lie in the conditions of uncertainty about the future development and in estimated social values of market prices and externalities or public goods. Besides, CBA is very complex method, where the quality of outputs is directly dependent on the availability of all needed data.

CBA valuates not only the externalities or public goods in monetary terms as they do not have their market prices, but also transforms the actual market prices in their social values using shadow prices. The methodology of shadow prices was developed primarily for evaluation of the projects in developing countries, where the markets were not efficient to correct them. Shadow prices for internationally traded goods are deducted from boarder prices of the items.

At the RDP project level, even-though the agricultural production is created in domestic environment, the idea is that if the output was not produced in the CR, it would have been imported. Therefore, the value that society gain when the project is implemented equals to the shadow price of imported equivalent item. The shadow price can be based on Free on Board (FOB) terms. Similarly, if the good was not used in the project, it would have been exported, so the shadow price is again FOB. Shadow price ratio (SPR) needed in CBA for transforming market prices to social prices is calculated as the division of shadow price of the item and its appropriate market price.

6.3 Results

To assess the projects financed from Rural Development Program by the MoA was created a method of simplified financial plan, which, unlike complex CBA, ignores the part of socio-economic assessment. It is based only on financial part which was transformed to the RDP Model Calculator. It has been continually developed and currently is available its second version described in the Results section, which will be primarily used for operation M4 (operation 4.1.1. – Investments in agricultural holdings) and M16 (operations related to the cooperation of the agricultural of forestry subjects).

A simplified version of the financial plan has been already used by the Payment Agency State Agricultural Interventional Fund (SAIF) for selection of the projects submitted for the operations M6 (6.4.1. – Investments in non-agricultural activities and 6.4.2. – Support for agro-tourism). For these measures do not exist relevant normative documents of inputs into the calculator (costs and revenues of the project), they were entered manually by the applicant. Then that information was assessed by an external evaluator who checked if they are real, possible, and reliable. In the advance version of the calculator, there is the database of inputs available and therefore the model can be connected to this database of normative documents. There is, therefore, no need for external evaluator in the majority of

cases (the database of the possible expenditures and revenues cannot cover all types of projects financed from RDP as they differ significantly, nevertheless, it already covers a significant part and is being continuously updated).

In the following sub-chapters, we first describe the structure of the RDP Model Calculator and then introduce its inputs.

6.3.1. RDP Model Calculator

RDP Model Calculator is fully automatic calculator programmed in the Microsoft Excel spreadsheet, version 2010. It follows the structure of the general financial plan of the projects in simplified version as it does not take into account the discount rate and shadow prices. The structure of the result part of the RDP Model Calculator can be seen at Fig. 1.

Figure 1. Results part of the RDP Model Calculator

Dílčí výsledky dle komodit za celkové období			
	Komodita 1	Komodita 2	Celkem
Kód komodity	K1		
Název komodity	Pšenice potravin	0	
Rozsah	50		
Intenzita	5,51	0,00	
Tržby	17 435 647	0	17 435 647
Náklady	8 835 700	0	8 835 700
Zisk	8 599 947	0	8 599 947
Zisk/rok	859 995	0	859 995

Výše investice	10 000 000
Počet let	10

*Uživatel zadá žlutě označené buňky

Výsledky projektu za celé období	
Celkové tržby (včetně podpor) v Kč	17 435 647
Celkové náklady v Kč	8 835 700
Celkový zisk k úhradě investičních nákladů v Kč	8 599 947
Investiční náročnosti tržeb	0,86
Doba návratnosti projektu (let)	11,63
*Celkový zisk projektu nepokryje vloženou investici z PRV	

Source: own elaboration.

The user fill-in only basic inputs (yellow fields). First, they select the commodity involved in the project16. There are almost 50 of them and the database is still being widened. The user can select and combine up to 10 commodities (Komodita 1, Komodita 2, ...). Then the farmer selects the scope of the pro-

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[16] For example: Innovation of parlours for cow's milk – the commodity: milk.

duction (e.g. 50 hectares of harvested area, or the number of animals), the height of the investment together with the amount of subsidy requested, the length of the project, and intensity (e.g. crop yield, milk yield, ...). The last indicator is optional as there are pre-set values which might or might not be used. Then the RDP Model Calculator calculates the sales (Tržby), costs (Náklady), and revenue (Zisk) for the whole period (10 years) and per year. The scheme of the calculation is presented at Fig. 2.

Figure 2. Scheme of the RDP model calculations

Production

Scope of commodity production / year ✕ Intensity of production / year ✕ Price / unit* = Total sales / year

Income with subsidies

Scope of commodity production / year ✕ Subsidy / unit / year ➕ Total sales / year = Total income / year

Expenditures

Scope of commodity production / year ✕ Expenditures / unit / year ➕ Other expenditures / year = Total expenditures / year

Profit

Total income / year ➖ Total expenditures / year = Total profit / year
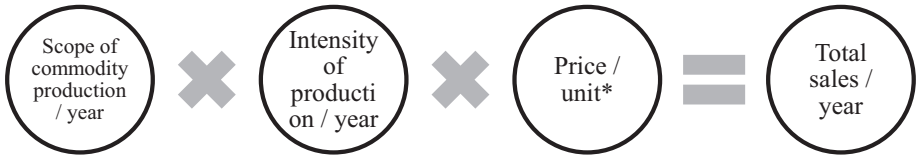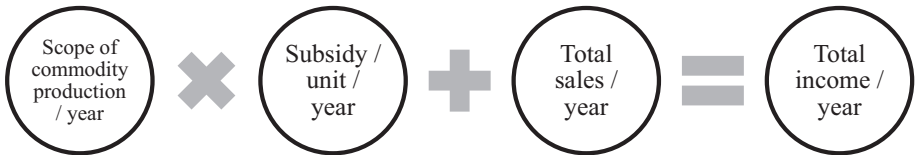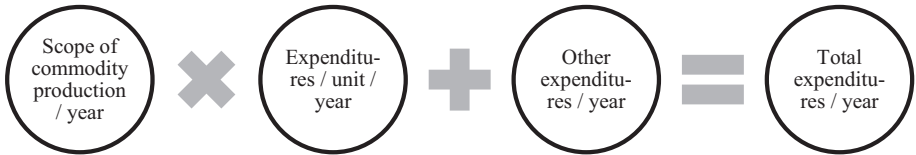
* Price can be adjusted by shadow prices from SPR Sub-MODEL.

Source: own elaboration.

Consequently, the indicators serving for the project selection are calculated. Particularly investment to sales ratio (Investiční náročnost tržeb) calculated as (1) and payback period (Doba návratnosti).

$$\text{Investment intensity of sales} = \frac{\text{Total profit for all years of project duration}}{\text{Investment costs}} \quad (1)$$

The later one was chosen by the MoA to be the evaluation criterion which will decide about the acceptability of the project. Project payback period is calculated as (2).

$$\text{Project payback period} = \frac{\text{Amount of subsidy}}{\text{Total profit for all years of project duration}} \quad (2)$$

Total profit is calculated as the total sales (incl. subsidies) in CZK (Celkové tržby (včetně podpor) v Kč) minus total costs in CZK (Celkové náklady v Kč). Amount of subsidy might be the same or lower than total investment costs depending on the type of the measure and other criteria set by the subsidy provider (e.g. young farmers have higher percentage of subsidy). The Tab. 1 shows the examples of each category together with the depreciation period. The payback period of the project is compared to the depreciation period of fixed assets determined by the accountancy law in the CR. The law divides the fixed assets into 6 categories and sets the depreciation period for tax purposes.

Table 1. Depreciation period according to Law on Income Tax no. 586/1992 Coll.

Group	Examples	Depreciation period (years)
1	Breeding cattle, breeding pig, equipment and tools, office machinery and computers, vehicles for the transport of ten or more persons, manure and fertilizer spreaders	3
1a	Motor vehicles (exception of motorbikes)	4
2	Agricultural and forest tractors, other agricultural and forest machinery (not included in group 1)	5
3	Greenhouses (plastic greenhouses), air-conditioning, perennial crops with an estimated fertility more than three years	10
4	Separate silos, silos for postharvest processing and storage of grain, construction of vineyards	20
5	Building (with exception of those stated in group 4 or 6), highways, roads, local and special communications	30
6	Buildings of hotels and similar accommodation facilities, administrative buildings, building of stores	50

Source: own elaboration

The payback period of the project must be lower than the depreciation period of the fixed assets. On the example in Fig. 1 the total profit will not cover the investment to equipment in crop production in less than 5 years that is the depreciation period for this equipment given by the law. Therefore, this project is not suitable to be financed from RDP.

6.3.2. Input data for the model

In the first step, it was necessary to create a database of inputs for financial part of cost benefit analysis. The database consists of normative documents, sub-model, which takes into account the shadow prices, and the model calculations themselves. Besides the commodity prices and expenditures on commodities and other expenditures, the RDP Model Calculator includes also average value of production intensity (yields) and the average subsidy per unit of production.

The calculator also includes the SPR Sub-MODEL which serves for the calculation of the index of shadow prices and the conversion of the financial plan in shadow prices. This conversion is important for complex Cost Benefit Analysis, where all prices (market and prices of the public goods and externalities) are expressed as social values.

The project is normally calculated for 10 years duration, and the calculator can combine up to 10 commodities.

1. <u>Commodity prices</u>

Data about prices comes from CZSO. There are two types of prices gained by different approaches. First, the prices of the most common commodities (cereals, maize, rapeseed, potatoes, apples, sugar beet, onion, hop, cabbage, milk, beef, pork, poultry, and eggs) are predicted to the whole duration of the project. Predictions for next 10 years are annually updated. IAEI uses for the prediction models based on following methods: deriving from the European and world prices through price indices growths, Ordinary Least Squares Method, Winter's Method, ARIMA models and the combination of stated methods.

Second, for other commodities averages prices for the period of 2011--2015 are used. The 5-year-old averages will be also updated annually. The normative of averages over the last 5 years will change. RDP Model Calculator can use both types of data.

2. Expenditures and subsidies on commodities

The expenditures on commodities were also gained in two ways. For the most common commodities, the predictions of costs were done for 10 years and will be annually updated. Plant production includes: expenditures on fertilizers, fungicides, herbicides or sprays, seed, and labour costs. In animal production there were observed costs of own / purchased feed and labour costs. Predictions were made by seasonal trend forecast model in software GAMS.

Second approach applied on less common commodities used average production cost per unit of production (for 5 last years, 2011-2015 in this case). The data were obtained from Cost survey (called NAKL) done regularly by IAEI.

Subsidies on commodities were calculated as the average of subsidies for 5 last years (2011-2015 in this case) per unit of production. Data were taken again from NAKL.

3. Shadow prices of commodities (SPR Sub-MODEL)

There are again two types of calculation. First, and easier way, is to take into account the ratio of price to import to the price of export. The prices are weighted by export / import volume balance. Currently, it is the best possible method that can be used due to data availability.

Second, methodologically correct, variant is based on SPR index calculation. It quantifies all transmission and distribution costs of individual commodities. SPR should be calculated as the division of shadow price of the item and its appropriate market price (3).

$$SPR = \frac{\text{Shadow price of the good}}{\text{Market price of the good}} \qquad (3)$$

However, currently it is not possible to fill the SPR sub-model with necessary data for this calculation.

RDP Model calculator is connected to SPR Sub-MODEL and can use both types of data.

6.4   Conclusions

Procedures for CBA and other evaluations of supports on investments under the RDP are very useful and necessary instruments to justify the supports and to reduce risks of their possible deadweight losses. Under other research tasks of the Institute of Agricultural Economics and Information for the Ministry of Agriculture it is evident that deadweight losses are linked not only with opportunity costs of the supports to be spent in other sectors of the national econ-

omy, but also inside of agriculture with the relation between supported and unsupported farms. The presented RDP Model Calculator could be a good instrument to reduce risks issuing from the latter mentioned deadweight losses.

The aim of the article was to introduce the methodology of the evaluation of the projects financed from the Rural Development Programme (RDP) of the Czech Republic for years 2014-2020. We presented the procedure for calculating the key indicators, and the creation of the databases of materials for project evaluation by CBA analysis.

RDP Model Calculator is a simplified version of CBA consisting only from the financial plan and is linked to a database of materials. The result of the work is a comprehensive database of inputs, presented in time series for the period 2014-2020, which are annually recalculated. It is not a complex CBA analysis yet.

CBA is a complex method, where the quality of outputs is directly dependent on the availability of all needed data. Data sources are constantly updated using IAEI prediction models and cost survey NAKL.

Currently, RDP Model calculator is used by State Agriculture Intervention Fund (Payment Agency of the Ministry of Agriculture) to evaluate projects in RDP. For the next round of applications is being developed the improved versions of RDP Model Calculator, which will fully work with predictions of prices, intensity/yields and expenditures. Furthermore, the model will be ready to evaluate the impact / importance of externalities in projects.

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7. Bulgarian Programme for Rural Development (2007-2013): socio-economic outcomes and lessons

Abstract

Rural development and rural communities are among the main priorities for the EU policy. In recent decades, this development is becoming less dependent on agriculture, enhancing the multifunctionality of rural areas. The main idea of multifunctionality is that agriculture and rural areas perform a range of functions for modern society in addition to providing food and fibre. There is a consensus that multifunctional agriculture is territory-based.

The aim of this paper is to analyze the content and implementation of the "Programme Rural Development" and assess the socio-economic parameters of rural development in 2007-2013 in the light of the concept of multifunctionality of agriculture and rural areas.

The study consists of several parts. The first one is devoted to the concept of multifunctionality in agriculture and rural development and the reform of the CAP after the conference in Cork. The second part includes the methodological framework of the study. In the next sections the characteristics and problems of rural areas in Bulgaria before and after implementing the first RDP are presented. On that base are made conclusions and summarized proposals for a policy change.

7.1 Introduction – Concept of multifunctionality and CAP reforms after Cork declaration

Multifunctional agriculture has become a central reference point of agricultural and rural policy [Wilson, 2007]. The concept of the multifunctionality of agriculture embraces all goods, products and services created by farming activities. The term was used for the first time in 1993, by the European Council for Agricultural Law in an effort to harmonize agricultural legislation across Europe and to provide the general notion of 'sustainable agriculture' with a legal definition [Losch, 2004].

The commitment of the European Commission to multifunctionality was formally articulated in the Cork Declaration in 1996 [European Commission, 1996; Potter and Tilzey, 2005]. This Declaration recognised the declining economic role of conventional agriculture and emphasised that agriculture should have been seen as a major interface between people and the environment, and that farmers have a responsibility as 'stewards of the countryside' [Gorman et al., 2001; Losch, 2004]. Many authors have evaluated the Cork Declaration as marking "a new and decisive stage in European rural policy" [Delgado et al., 2003: 29].

Some authors describe, that "multifunctionality appears as a central element of the European agricultural model put forward by the European Council in Agenda 2000" [Gallardo et al., 2003]. In the document the new role of the farmers in the rural areas has been underlined – „Rural areas are multifunctional, and farmers should be encouraged to exploit all opportunities for rural entrepreneurs".

Multifunctionality was reiterated in many national agricultural policies of the late 1990s, the best examples of which are reference to multifunctional agriculture in the preamble to the French 'Loi d'Orientation Agricole' of 1999.

'Multifunctionality' has emerged as an alternative concept to postproductivism to describe the ongoing changes in rural areas [Almstedt, 2013]. Woods [2011] describes multifunctionality as the result of attempts by rural geographers to move beyond the deadlock created by the productivist/post-productivist agriculture dichotomy in the late 1990s. Wilson [2001] challenges the linearity in the productivist/post-productivist transition by introducing the concept of 'multifunctional agricultural regime' which "allows for multidimensional coexistence of productivist and post-productivist action and thought", and as he argues, "may, therefore, be a more accurate depiction of the multi-layered nature of rural and agricultural change" [p. 95]. Also, multifunctionality "better encapsulates the diversity, non-linearity and spatial heterogeneity that can currently be observed in modern agriculture and rural society" [Wilson, 2001, p. 96].

In scientific literature, there is no common understanding of the nature of multifunctionality of agriculture. Even the most frequently quoted in the literature working definition of the Organization for Economic Cooperation and Development [2001] does not reflect the nature of the phenomenon, but rather only its two main characteristics. According to it, "the key elements of multifunctionality are a lot of market and outcomes that are jointly produced in agriculture", as well as "the fact that some of the non-market effects obtain the characteristics of public goods with the result that markets for these goods do not exist or function poorly" [OECD, 2001]. Among European researchers, more and more

widespread support finds the positive approach towards the issues of multifunctionality. It is a bound and displayed from the characteristics of the agricultural production process and its results. Together with the production of market and non-market public goods, the subject of research interest is the impact of agricultural activity. Most authors do not distinguish the effects of agricultural production by produced by it related products and public goods. Even researchers who have recognized this distinction accept that due to the complex nature of the impacts of agriculture that line is non-clear [Mollard, 2003]. Agriculture multifunctionality is interpreted through the functions that are immanent to the industry – the production function, food security, social function, employment in the territory and the impact of environment. Only the latter is among the widespread aspects of the analysis of the multi-directional impact of agriculture on environment. Some authors [Potter, Tilzey, 2005] associate multifunctionality concept with the social welfare and the need for diversification of the additional functions of agriculture such as biodiversity, landscape, cultural heritage and others. For other researchers [Tilzey, 2003] multifunctional agriculture is a concept that encompasses many physical benefits and services to the agricultural system, which have similar effects on humans and the surrounding environment.

The agricultural and rural multifunctionality, broadly reflect the OECDs positive-normative debate. Multifunctionality is described in three aspects: as a palliative to the productivist 'cost-price' squeeze; as spatial regulation of the consumption countryside and as part of sustainable rural development [Marsden and Sonnino, 2008].

The conclusion of the literature review might be summarized as:

- First – The multifunctionality might be focused on first place as an agroindustrial model, which reflects into to enhance productive monofunctional model. In this context, the multifunctional character of agriculture is restricted to the concept of pluriactivity, directed to combination of agricultural and non-agricultural incomes within the farm household [Gasson et al. 1988; Eikeland, 1999]. Under this farm-based approach, pluriactivity is interpreted mainly as a survival strategy that helps the least productive farmers to combat increasingly harsh market conditionsdor.

- Second – The Paradigm in which agriculture begins to lose its centrality in society, and nature is conceived mostly in terms of landscape value [as a consumption good] is known as arising from a post-productivity. Under this model the farm-based approach to the multifunctionality of agriculture is replaced by a land-based approach that emphasizes the different [and demarcated] functions of agricultural land [Vereijken et al., 2002]. In short period farm pluralactivity is replaced by farmland diversification. For example,

the interpretation [Gerowitt et al., 2003] state that agricultural land-use has production, ecological, social and aesthetic functions, and each of these functions can add to the farm's income either by creating resources or by buffering resource consumption.

- Third – The multifunctional agriculture is taken as a part of sustainable rural development. There is an emerging sustainable rural development paradigm, which redefines nature by re-emphasizing food production and agro-ecology and it reasserts the socio-environmental role of agriculture as a major agent in sustaining rural economies and cultures [Altieri, 1987; Guzman and Woodgate, 1999].

Furthermore, in contrast to the other paradigms, which assume the atomistic nature of farms and the land associated with them, the rural development paradigm suggests the potential symbiotic inter-connectedness between farms and the same locale [Doitchinova, Zaimova, 2014]. In this context, "multifunctional agriculture acquires its most comprehensive meaning and displays its highest integrative development potential"[Marsden and Sonnino 2003].

Multifunctionality is a proactive development tool to promote more sustainable economies of scope and synergy [Marsden, 2003: 186], which should contribute to rural development, an activity and have to meet at least three conditions:

- add income and employment opportunities to the agricultural sector;
- contribute to the construction of a new agricultural sector that corresponds to the needs and expectations of the society;
- simply a radical redefinition and reconfiguration of rural resources, to varying degrees, in and beyond the farm enterprise.

This paper use the term multifunctionality to refer to rural multifunctionality. This is consistent with the work of Rodrıguez Rodrıguez et al. [2004] who argue in favour of a broader 'territorial' concept of rural multifunctionality. The idea can also be applied to a specific territory, which saw the emergence of rural multifunctionality. This concept is typically horizontal and includes all the activities that can be performed in rural areas, regardless of whether they are eminently agricultural, related to agriculture or entirely independent of that primary sector [Potter, 2004]. Therefore, rural multifunctionality is based on the territory and refers to the multiple functions that rural areas perform on the basis of an integral conception of their potentialities.

7.2   Multifunctionality in Programme for Rural Development: a framework for analysis

The new EU member states since 2004 and since 2007 faced a rural development policy menu essentially the same as the EU15, but with some extra measures added to address specific issues in these countries. To focus the analysis, Irina Râmniceanu and Robert Ackrill [2007] have divided rural development policy measures into two groups: those principally competitiveness-oriented ['C' policies] and those principally multifunctionality-oriented ['M' policies].

In the existing literature, no formal distinction is made in identifying measures that promote [rural] multifunctionality. Only European Commission, in 2003, offers a three-way split between the rural development policy measures for 2000-2006: 'restructuring/competitiveness', 'environment/land management' and 'rural economy/rural communities', although this is not legislatively-based.

Râmniceanu and Ackrill combine the second and third of these divisions. First reason, it helps simplify and clarify the conduct and interpretation of the subsequent analysis. Second reason, by joining these measures together the non--commodity agricultural measures and the non-agricultural measures that, together, distinguish the normative approach to multifunctionality, are unified neatly.

C-oriented measures are those, which seek to improve efficiency in the production of commodity outputs. Measures can be targeted at any point along the food chain from production [with measures such as investment in farms and training] through intermediate stages [such as the establishment of producer groups and investment in processing facilities], to consumers [for example activities related to marketing, or promoting food quality].

M-oriented measures seek primarily to raise the efficiency with which resources are used to produce commodity outputs – to promote environmentally friendly methods of farming and land management, or to promote economic diversification and the economic health of the wider rural economy and community. M measures can still improve the efficiency with which factors of production are used.

Having identified the available rural development measures as C-oriented or M-oriented, Râmniceanu and Ackrill [2007] utilise a comprehensive dataset of the public funds allocated to each rural development measure in eight countries – new members of EU. This has been obtained from the pre-accession SAPARD and post-accession programming documents [2004-2006].

Based on four axial structure of the rural development programs for 2007--2013 the paper is proposing and assessing the direction of Bulgarian policy for rural development. The obtained methodology is based on follow-substantiated allegations, statements and steps:

- The program for rural development is divided into two groups – Competitiveness-oriented measures and Multifunctionality-oriented measures;
- Calculation and analysis between adopted and implemented of the RDP measures;
- It is given a particular focus is onto the policy of rural development in the context of a "competitiveness – multifunctionality";
- Rated are some results and trends in rural development in the period of implementation of the first program of rural development in Bulgaria and the results are compared on EU level;
- Assessed are the changes of structures of funding measures and ratio "competition – multifunctionality" of the Rural Development Programme;
- It is justified the need of changes into RPD program in Bulgaria by conducted expert survey;
- According to collected and analyzed outcomes are proposed lessons and policy recommendations.

7.3   General characteristics of rural regions of Bulgaria – Need of support for Rural areas in Bulgaria

In Bulgaria there is a big diversificztion in the in the size of the level 2 regions in the European scale. Bulgarian regions are medium in size – 18.5 thou. km^2. The average size of area [NUTS III] is 3964 km^2, with a population of 264 thou. residents. The average size of a municipality [LAU 1] is 420 km^2, 27.9 thou. Bulgarian municipalities are among the largest in the EU, which reflects into some differentiations between the EU countries of distribution the support under various measures. Bulgaria is among the countries with medium level of assurance with a total area, but occupies leading positions in territory of level 2 regions, defined as rural areas [98.5% of the territory]. This is a prerequisite in programming period [2014-2020], Bulgaria to allocate more funds under Pillar 2 of the CAP. It is undisputed, however, that changes in the typology of the regions reflected in the new programming period and in the national definition of "rural region" which applies to Level 4 [LAU 1] – the municipalities.

According to EU NUTS classification [valid from January 1, 2008] Bulgaria consists:
- 97 Region NUTS 1 level,
- 271 regions at NUTS 2 level and
- 1303 regions at NUTS 3.

By European classification of the region, NUTS 1 [2007] Bulgaria is divided in:

- 6 planning regions [NUTS 2 level],
- 28 administrative regions [NUTS 3] and
- 264 municipalities [LAU 1 level].

Based on the definition of the OECD [Organisation for Economic Cooperation and Development] to rural areas in 2007 in Bulgaria are 20 predominantly rural area [NUTS 3], 7 intermediate areas and only one predominantly urban Region – Sofia. Thus, predominantly rural and intermediate areas cover 98.8% of the country and 84.3% of its population. This places Bulgaria among the countries with the lowest share of territory in urban areas [NUTS 3] and among the countries with the highest share of intermediate areas. As of 2009, Bulgaria predominantly rural areas as defined by the OECD, are 11, 16 intermediate and predominantly urban remains again only urban area Sofia. The distribution of the new typology of Bulgarian territory is as follows: 1% predominantly urban, 45% transitional and 54% predominantly rural.

Compared by the OECD methodology used in EU, the difference is by moving 20,2% of the Bulgarian territory from transitional to predominately rural.

In EU the predominant type of areas are rural [56%] and transitional [34.9%]. Predominantly urban [9.1% in EU] area is mostly in Netherland [46.5%] and Czech Republic [14.6%]. The comparison is shown in figure 1.

Every region has assessment made by variety of indicators. The average assessment for Bulgaria is 36.4 points and the comparison between types of regions is shown in table 1.

According to the level of summary assessment of the socio-economic development compared to the national average level the municipalities specific territory is divided into four groups [map 1]:

- First group – with scores above the national average-18 municipalities [7.8% of the total population].
- The second group – with estimates between the national average and the average for the specific territory – 66 municipalities [28.6% of the entire population].
- A third group – with estimates of the average for the specific territory and threshold critical for this group of municipalities – 131municipalities [56.7% of the entire population].
- The fourth group – with scores below the threshold of criticality – 16 municipalities [6.9% of the total population].

Figure 1. Distribution of total land of EU countries by type of region

	predominantly urban	transitional	predominantly rural
Czech	14.6	37	48.4
Netherlands	46.5	51.3	2.1
Hungary	0.6	33.3	66.1
Romania	0.8	39.4	59.8
Portugal	6.5	6.4	87.1
Cyprus	0	100	0
Ireland	1.3		98.7
Denmark	1.2	26.9	71.9
Greece	5.7	12.1	82.3
Bulgaria	1.1	45.1	53.8
EU	9.1	34.9	56
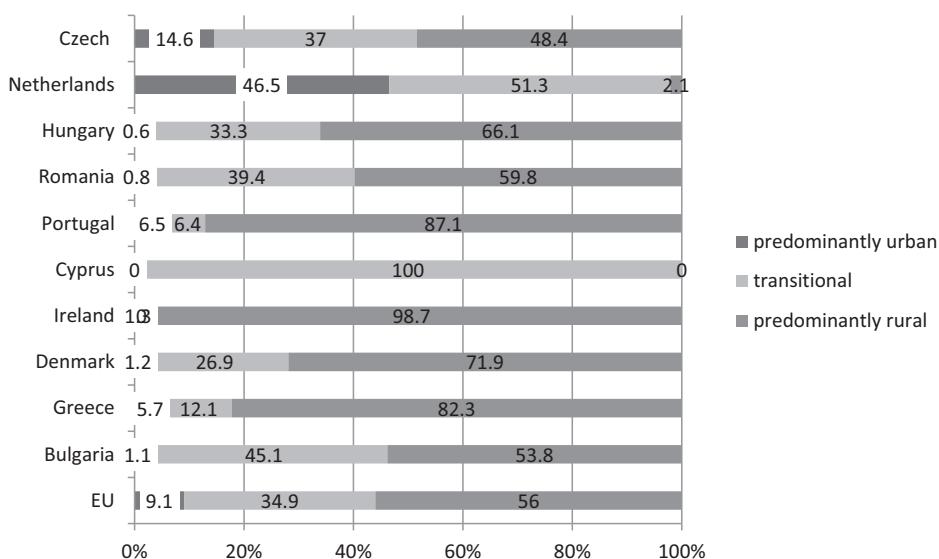
Source: own calculation by Eurostat regional yearbook, 2010.

Table 1. Indicators of specific aspects of the socio-economic situation

Indicator	On national level	Rural municipalities	Variance
● Demographic situation	69.5	63.2	- 9%
● Changes in population	54.8	45.5	-17%
● Economic situation	26.5	23.6	-11%
● Property and income	24	18	-25%
● Infrastructure	15	12.5	-17%
● Public services	28.5	27.5	- 4%

Source: project BG161PO001 / 5-01 / 2008/055 "Programming of Regional Development for 2014-2020".

Map 1. Socio-economic status of municipalities from specific territory
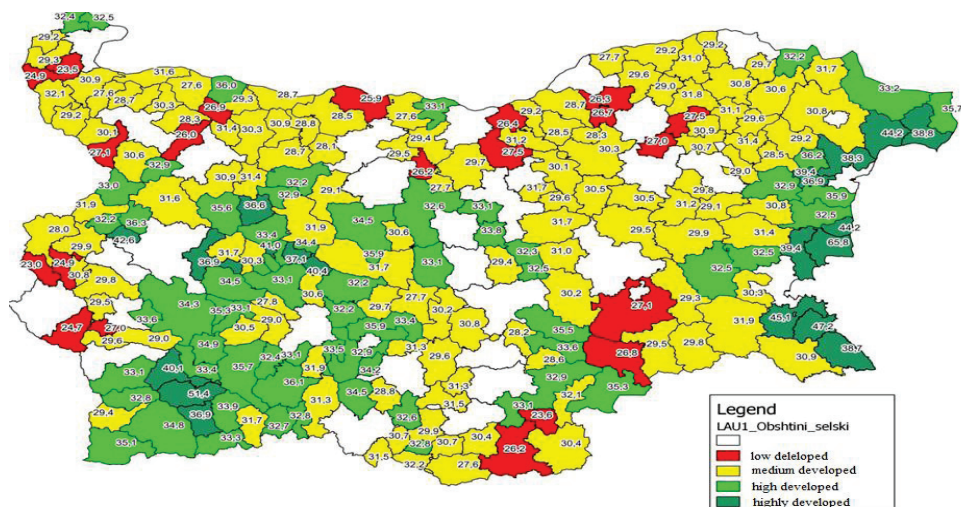
Source: Project BG161PO001 / 5-01 / 2008/055 "Programming of Regional Development for 2014-2020".

The main conclusions of that distribution between the groups are connected with:

- Over half of rural communities are in the range "below average specific territory" development level, but above the threshold of criticality;
- Large polarization in the overall socio-economic condition;
- Rural municipalities are separated into two poles [above the national average and below the criticality] are an equal number of municipalities.

7.4 Assessment of "Programme for Rural Development of Bulgaria" compared by other new member states

Bulgaria as a member of EU is taking a part of the EU's rural development policy wich evolved as part of the development of the CAP, from a policy dealing which the structural problems of the farm sector to a policy addressing the multiple roles of farming in society and, in particular, challenges faced in its wider rural context. To ensure a balanced strategy, of implementing PRD a minimum funding for each thematic axis is required. The proposed minimum funding percentages of 10%, 25% and 10% respectively for axis 1, 2 and 3 are a safeguard to ensure that each programme reflects at least the three main policy objectives, but the percentages are set sufficiently low to leave Member States

or regions a high margin of flexibility [55% of EU funding] to emphasize the policy axis they wish in function of their situation and needs. For the LEADER axis, a minimum of 5% [2.5% for the new Member States] of the EU funding for each programme is reserved. The LEADER expenditure counts for the three policy axes. The main aims of the Axes are as follow:

- Axis 1 – Improving the competitiveness of the agricultural and forestry sector;
- Axis 2 – Improving the environment and the countryside;
- Axis 3 – The quality of life in rural areas and diversification of the rural economy;
- Axis 4 – LEADER.

The highest financial support was directed to Axis 3 – The quality of life in rural areas and diversification of the rural economy, where the amount was 925721 thou. euro, and the smallest part during this programming period was 2% – Axes 4 – LEADER with amount of 61591 thou. euro.

The comparison between Bulgaria and other EU member states for the same period of financial support is interesting [figure 2].

Figure 2. Distribution between Axes in EU countries
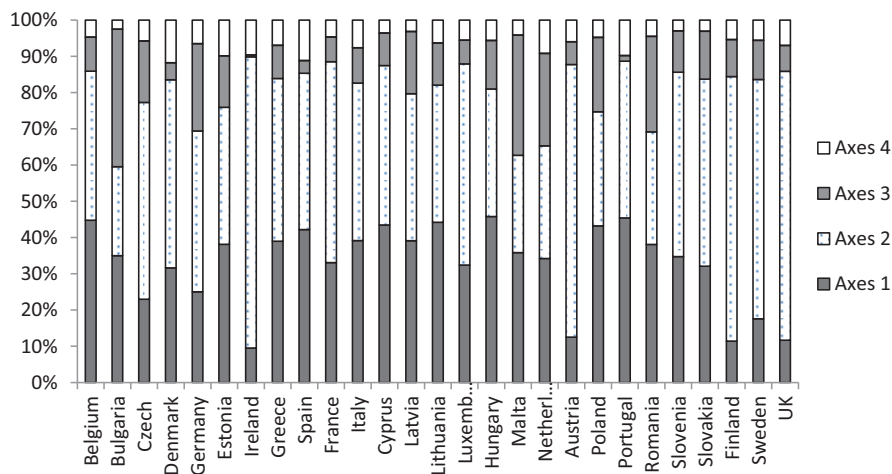
Source: own calculation by Eurostat regional yearbook, 2010.

According to the figure 2 it is shown that the highest distribution to Axes 1 – Improving the competitiveness of the agricultural and forestry sector is allocated by Hungary [46%]. Over 40% to Axes 1 allocate as well Portugal, Belgium, Lithuania, Cyprus and Poland. On the bottom of the table of allocation to this, Axes are Ireland [10%], Finland [11%], UK [12%] and Austria [13%].

Bulgaria allocated from the budget approximately 35%, along with Netherlands, Malta and Slovenia. In nominal level the highest amount takes Poland – 5 705 201 thou. euro, and the lowest amount take Malta and Luxembourg accordingly 26730 thou. euro and 30772 thou euro.

Axes 2 – Improving the environment and the countryside Bulgaria allocates 25%, which compared with all other EU country is the smallest share. Closer to that share can be compared only Malta and Poland, where the percent is 31%. Countries as Ireland, Austria, Finland and UK allocates the biggest amount of the support to this Axes, even more, the share is over 70% and for Ireland it is 80% of the total distribution.

Axis 3 – The quality of life in rural areas and diversification of the rural economy. For Bulgaria the distribution the support to Axis 3 is very important so the share is the highest among the other countries of EU and it reaches 38%.

Leader Axis is as well important but the allocation of the first program period for Bulgaria is 3%. Same share is given as well from Latvia, Slovenia, and Slovakia. Only Denmark and Spain gave share more than 10% of the total distribution of the support.

Growing challenges facing agriculture and rural areas in Europe calls for a relocating of the CAP after 2013. This is resulting in the needed reform for the next programming period – 2014-2020. In the new programming period also seeks to realize the objectives of the Common Agricultural Policy of the European Union, enshrined in the Treaty of Rome. On the conference of the European Commission "The Common Agricultural Policy after 2013" from 19-20.07.2010 have been highlighted some of the ways for future development of agricultural policy and related rural development. It is proposed that in next programming period should be performed a significant changes in the two Pillars of the CAP – direct payments and the Program for Rural Development.

Within the framework of the general objectives and structure of the RDP [2007-2013] each EU member has chosen a different number of funding measures and has allocated funds for financing. Within the group of the 12 new Member States [adopted in 2004 and 2007] the differences between the number of approved measures in the four axes of the RDP are ranging between 18 [Poland and Malta] and 31 [Hungary]. Half of the countries have chosen between 24 and 28 out of a possible 43 or 44 measures.

7.5 Competitiveness and Multifunctionality oriented measures

The program for rural development is divided into two groups – Competitiveness-oriented measures and Multifunctionality-oriented measures. The grouping of program measures are systematized in table 2.

Table 2. Grouping of measures of the RDP [2007-2013]

Competitiveness-oriented measures	Multifunctionality-oriented measures
Axes 1 – All 18 measures	Axes 2 – All 13 measures
Axes 3 311 Diversification into non-agricultural activities 312 Business creation and development 313 Encouragement of tourism activities	Axes 3 321 Basic services for the economy and rural population 322 Village renewal and development 323 Conservation And Upgrading Of The Rural Heritage 331 Training and information 341 Skill acquisition, animation and implementation of local development strategies
Axes 4 411 Implementing local development strategies: Competitiveness	Axes 4 412 Implementing local development strategies: Environment/Land management 413 Implementing local development strategies: Quality of life/Diversification 421 Implementing cooperation projects 431 Running the local action group, acquiring skills and animating the territory as referred to the Article 59

The group of measures, addressed to competitiveness, includes all 18 measures of the axis 1, 3 of the measures aimed at supporting the diversification of the rural economy [3 in total – 311, 312, and 313] and the sub-measure aiming higher business competitiveness in the framework of implementation of local development strategies [411]. Addressed to multifunctionality are all 13 measures of axis 2, oriented to improve the quality of life in rural areas [4 in total], as well as those for strengthening rural communities and implementation of local development strategies [environment and quality life – 412 and 413] and others [cooperation and local action groups – 421, 431].

The measures 311, 312, and 313 although aimed at increase of multifunctionality of rural areas, in practice, they result directly in higher competitiveness of the business units on the territory. Ultimately, this leads to increased competitiveness of the region.

After calculating the structure of two groups funding measures, if a country allocates more than 80% of the public rural development funds to M measures, that country is described as exhibiting a Strong M-Preference.

If the M-allocation is between 60% and 80% – a 'Moderate M-Preference'; for an M-allocation between 40% and 60%, Balanced Approach'; between 20% and 40%, a 'Moderate C-Preference'; and below 20%, a 'Strong C-Preference'.

In order to appreciate the differences in the priorities of rural development in both programming periods questionnaire was developed and a survey was conducted among experts. Experts were asked to classify the new measures in the Programme for Rural Development [2014-2020] and group them into four axes of the Programme for Rural Development [2007-2013]. On this basis were assessed changes in development priorities. The results are compared with implemented new Programme [figure 3].

The assessment of the financing structure of the measuring groups, oriented to competitiveness and multifunctionality have shown that Bulgarian program for rural development can be described as oriented towards competitiveness – 'Moderate C-Preference'.

The data from figure 4 shows that 66.5% of funds are directed to the competitiveness of the businesses and rural areas and 33.5% for stimulate multifunctionality. Poland is having the closest allocation of the funds – 67.4% for Competitiveness and 32.6% for multifunctionality.

Figure 3. Distribution of EU countries by M and C oriented model
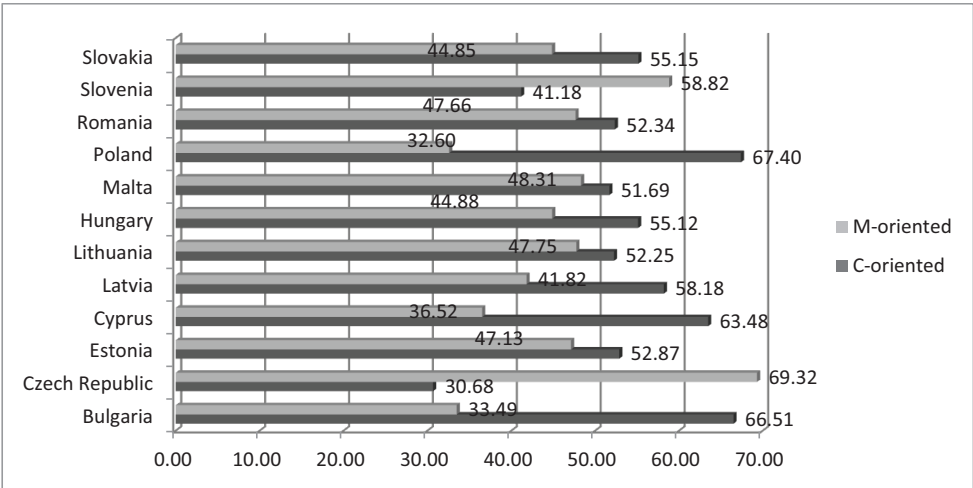
Source: own calculation – EC, 2013, Rural Development in the European Union. Statistical and Economic Information, Report 2013.

The comparison with other new EU member states shows that in most of the countries [Estonia, Latvia, Lithuania, Hungary, Malta, Romania, Slovenia, and Slovakia] balanced approach is applied. Most often, the share of the

measures, oriented by multifunctionality, are in range between 41.8% [Latvia] and 58.8% [Slovenia].

Reallocation of budget priority axes for the next programming period is an important part of achieving better development of the agricultural sector and becoming a competitive industry in Bulgaria. That is why 5 years before the new program period high interest was given to the future development to the program.

Table 3. Share of M-oriented measures

	Share of M- measures	Number of countries	Country
Moderate M-Preference	60%–80%	1	Czech Republic
Balanced Approach	40%–60%	8	Estonia, Latvia, Lithuania, Hungary, Malta, Romania, Slovenia, Slovakia
Moderate C-Preference	20%–40%	3	Bulgaria, Cyprus, Poland

Source: own calculation.

In 2010 was conducted a research in Bulgaria, by 19 experts about future possible relocation of the program period 2014-2020.

New program period 2014-2020 is having different approach of allocating the budget. To be performed an analysis corresponding with previous Axes the current new measurements are allocated to the previous Axis distribution. This is made by conducted survey of agricultural experts who work in agricultural area and specialist of agricultural policy [23]. Scientific interest is the proposed allocation by the expert compared with the real allocation. According to their expertise was prepared allocation of 4 Axes and their percentage. The information is shown in the figure 4.

According to that research made in 2010 restructuring and modernization of Bulgarian agriculture, forestry and food industry, the funds to Axis 1 should be increased by nearly 30%, Axis 2 funds decreased by 16%. For achieving the goal build local capacity for employment and diversification of the economy is proposed sources to be reduced from 28.4% to 10%. Priority 4 experts believe that funds should be increased from 2.6% to 8%.

Figure 4 shows that the expectation of the experts was not fully adopted by the policy makers in Bulgaria. During the first period there was a balance between 1 and 3 Axes with approximately 35%, the new period relies on second Axes and cut down with 13.4% the Axes 1. The funds assigned to Leader approach increased with almost 100%.

Figure 4. Allocation of PRD program 2007-2020

	Axes 1	Axes 2	Axes 3	Axes 4
2014-2020	21.6%	50.1%	23.5%	4.8%
Proposed allocation	71.0%	11.0%	10.0%	8.0%
2007-2013	35.0%	24.5%	37.9%	2.5%
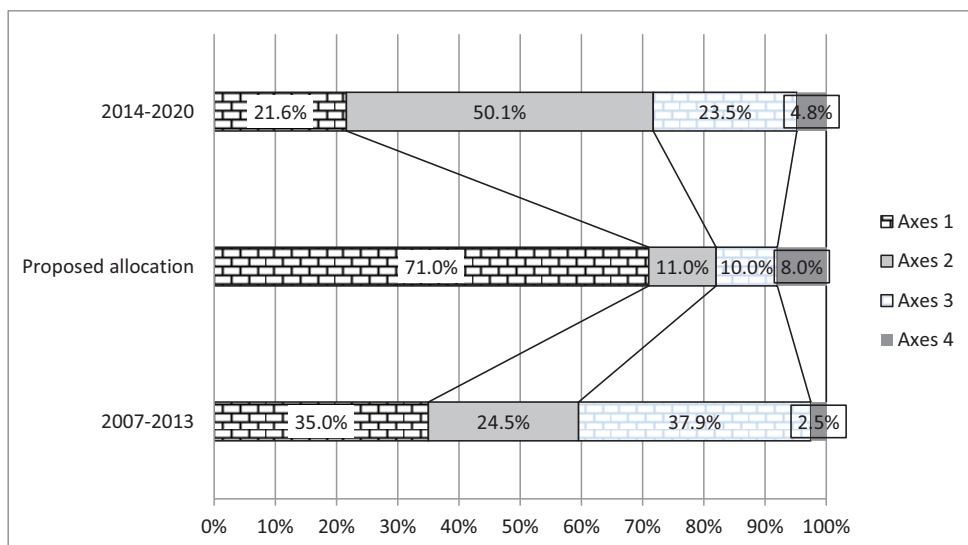
Source: *adapted by Harizanova 2011.*

7.6 Outcomes of RDP in Bulgaria

The late start of most of the measures program for rural development led to its completion at the end of 2015. This became possible due to application of the extensions with two years (rule 'n + 2'). Currently (as of end of July 2016) official data is not yet published on its completion. For these reasons, in Table 4 using current data on the progress of its implementation by the end of November 2015.

Table 4. Provisional figures for achieving the objectives of the measure (public expenditure on the basis of contracts)

Overflowing implemented		Implemented		'Failed' measures	
Measures	%	Measures	%	Measures	%
112 Young Farmers	134.9	226 Restoring forestry potential	72.5	122 Improvement of the economic value of forests	3.33
121 Modernization of agricultural holdings	107.3	311 Diversification into non-agricultural activities	61.2	141 Use of advisory services	0.3
123 Adding value to agricultural and forestry products	103.7	312 Support for micro enterprises	95.0	142 Establishment of producer organizations	3.67
321 Basic services for the population and the rural economy	802.2	313 Encouragement of tourism activities	84.1	223 First afforestation of agricultural land	27.8

Source: RDP, Information on the progress of the RDP to 01.12.2015.

Data show that funds under the various measures have been used in a range from 0.3 to 800%. In comparative terms, the lowest is the implementation of measures aimed at afforestation of agricultural land and improvement of the economic value of forests, association of farmers and others. The reasons are mainly related to raised expectations for the interests of beneficiaries. For example, under measure 142 Establishment of producer organizations in the RDP is enshrined indicator than 150 organizations have applied and 4 organizations, and approved projects only 2.

Made more than 10 changes to the terms and allocation of funds under the measures in 2007-2013 cause certain measures are exceeded. This is most pronounced in measure 321 Basic services for the population and the rural economy where the funds utilized to over 8 times more than originally approved.

As a result, the final statement RDP will report significantly different ratios between the areas and objectives of funding than originally approved.

The RDP reflects on socio-economic condition of Bulgaria. Observed is a change of the population share between types of regions but stabilizing the age structure.

During the period were observed many changes, as reducing the poverty of national level as well in rural regions. Other positive is increasing the employed person in long term 2010/2014. Unemployed people in rural Bulgaria are reduced.

The outcomes of RDP in Bulgaria can be found in the socio-economic indicators shown in the table 5.

Table 5. Socio-economic indicators of Bulgaria

Indicators	Rural regions	Intermediate regions	Urban regions
% of population 2014	37,11	44,81	18,07
change in population [%] 2014/2009	-5,6	-3	2,8
Age structure			
Less than 15 years	13,58	14,07	13,25
From 15 to 64 years	65,57	66,08	70,44
65 years or over	20,83	19,83	16,30
Total area [including inland waters]	53,63	45,14	1,21

Indicators	Thinly populated areas	Intermediate urbanised areas	Densely populated areas
People at risk of poverty or social exclusion ratio 2013/2014	-8,4	-7,8	-8,4
Employed persons as a share of total 15-64 y.o. population [%]	51,4	61,8	66,6
Change in employment rate 2010 to 2012 [age group 15-74]	-4,1	0,8	0,9
Change in employment rate 2012 to 2014	5,5	-0,9	2
Change in unemployment rate 2010 to 2012	2,7	3,7	1,3
Change in unemployment rate 2012 to 2014	-1	-1	-1

Indicators	Rural regions	Intermediate regions	Urban regions
Economic development: GDP [PPS/capita];[EU-28=100; 2011]	28,9	34,8	100,7
Structure of the economy [% GVA by branch] 2012			
Primary sector	12,1	6,5	0,2
Secondary sector	39,7	37,8	16,8
Tertiary sector	48,2	55,8	83
Change 2009/2012			
Primary sector	0,8	0,6	0
Secondary sector	3,2	0,9	-4,7
Tertiary sector	-4	-1,5	-4,8

Source: CAP CONTEXT INDICATORS 2014-2020, 2015 update, http://ec.europa.eu/ agriculture/cap-indicators/context/2015/2015-10-01-contextindicators_en.pdf

7.7 Lessons and policy recommendation

Many positive changes are observed in Bulgaria according to implementation of the RDP program, but results might be slightly better if some weakneses were overcome. The weakneses can be pointed as follows:

- The program started in 2007 but most of the measures started in the second half of 2008. The result is that from 5 years supporting Bulgaria has lost 30% of the time frame for implementing RDP. This lesson of lost time should be taken into account for the new RDP program;

- First call of part of the measures launch in 2008, but some of the measures were open in 2011;

- After open calls for some of the measures, they were stopped and reopen again after 6 months with new Ordinances of implementation;

- Not well-developed and constantly changing regulatory framework on the implementation creates uncertainty and discourages potential beneficiaries. For example, only in the 5 months [September 2013 – January 2014] the Minister of Agriculture and Food has issued three orders to change the rules to implement measures 41 "Implementation of local development strategies";

- Long delays in the processing of applications for reimbursement, which complicates the process of successful implementation. The period of reimbursement for 64% of respondents LAGs is between 6 and 9 months, and in 14% – even more than a year [Doitchinova, Stoyanova, 2014];

- Insufficient administrative capacity of local level for project management in support of local development activities. 52% of respondents indicate that despite the training of employees in municipal administrations there are only separate competent municipal employees who are responsible for the problems of developing and managing of the projects [Doitchinova, Stoyanova, 2014].

For the new programming period after 2015 can be proposed summarized conclusions and recommendations:

- Distribution of the budget of the RPD program should be in a compliance with the regional differences of the country and to be focused in multifunctionality and competeveness of the regions where the measure are implemented.

- The rural region on one hand is focused to agricultural activity but on the other hand is a place where successfully can be a good perspective for developing the economic sectors incl. tourism.

- The allocation of fund should be in a compliance with possibility of absorption of the funds and bring results.

- Community-led local development approach is having an increased share of the program according to previous program period, which should lead to supporting of Local organization, which will bring synergy effect for the regions where they operate;
- In the new programming period it is necessary to improve:
  - the stability and the transparency of procedures for implementing Rural Development Program as a requirement to increase the motivation and activity of farmers and local communities;
  - the coordination between the Ministry of Agriculture and Food, State Fund "Agriculture" and the beneficiaries of the measures from the RDP.
  - the coordination and conflict resolution between participants in the projects regarding some of the LEADER initiatives through surveillance and supervision regarding the process of decision-making and operational implementation;
  - the duration for payment of financial assistance under the measure;
  - the local self-government, which is an important factor in mobilizing local communities and rural areas development and for the increase of public participation at local level.

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8. Priorities of sustainable development of agriculture and rural areas within the region of Eastern Serbia

Abstract

Region of Eastern Serbia outspreads between the Danube River at the north and the Stara Planina Mountain at the southeast, in the Timok River valley, along the border with Romania and Bulgaria. It has approximately 238.6 thousand residents that live at the area of 7,130 km^2. It is a predominantly agricultural area with an economy based on natural resources (energetics and mining) and significant tourism potentials (Danube River and Stara Planina Mountain).

Based on strategic development priorities of Regional development strategy for Eastern Serbia (2011), three key thematic areas of development for Eastern Serbia were defined in the Regional EU platform (2015): 1) agriculture and rural development; 2) tourism; and 3) environmental protection. With the intention to create the stimulating environment for the realization of strategic development aims and measures, certain number of priority activities related to the agricultural policy of interest to the agricultural sector and rural areas of the Eastern Serbia region within the EU accession process were singled out and recommended.

In the paper have been discussed the potentials and limitations for the development of agriculture and related activities in the region, as well as all the needs for the state improvement by taking the recommended measures have been explained.

Keywords: agriculture, rural development, Eastern Serbia, priorities.

8.1 Introduction

Region is always considered as the optimal framework for integrated and sustainable socio-economic, demographic, cultural and environmental development of a specific territory, and the "best compromise" between fragmented lo-

cal initiatives and "distant" global national plans of development [Janković, 2012]. There is a long-standing general debate in many OECD countries on the effectiveness of regional support systems, especially in rural areas. In the OECD the New Rural Paradigm, it is concluded that integrated rural development requires a new focus on places rather than sectors and an emphasis on investments rather than subsidies [OECD, 2006].

EU rural area policies begin to adopt strategic concepts which is a significant shift towards an asset-based approach, necessary to respond to the specific territorial challenges and useful to provide programmes that make use of place--based assets and achieve effective regional results [Dax and Kahila, 2011]. The main characteristics of the territorial approach can be summarized as follows: a) a focus on specific places and on their territorial scale; b) an endogenous development strategy based on the territory's natural and socio-cultural assets and which aims at supporting the provision of public goods and services; c) a multi-level system of governance, aiming at co-ordination and networking both in the vertical sense (relations between different levels of government) and in the horizontal sense (relations between actors and stakeholders living and/or operating in the specific territory); and d) a focus on investment rather than subsidy [Mantino, 2011].

Sound land policy and planning make a significant contribution to sustainable and balanced territorial development [Popović and Živanović Miljković, 2013]. Land-use planning means the systematic assessment of physical, social and economic factors in such a way as to encourage and assist land users in selecting options that increase their productivity, are sustainable and meet the needs of society [FAO, 1993]. On the basis of an agronomic evaluation of land, based on climate, soils, and landform, and using available socio--economic data to formulate constraints, targets, and production options, the spatial resource allocation can be optimized with regard to multiple objectives [Fischer et al., 1998].

However, a decisive role in the growth of the economy and employment in rural regions belongs to local actors – policymakers, entrepreneurs and employees (and their internal and external networks, including cooperation with upper administrative levels, developing agencies and universities), i.e. to their capabilities to formulate policies to attract public and private investments and to perceive changes and adjust to them [Terluin and Post, 2001].

The 2013 CAP reform improves the strategic approach of rural development policy to defining (national and/or regional) rural development programmes (RDPs), strengthening the content of rural development measures and

linking rural development policy more closely to the other EU Structural funds. In line with Europe 2020 strategy, and the overall CAP objectives, following long-term strategic objectives for EU rural development policy 2014-2020 were identified: 1) fostering the competitiveness of agriculture, 2) ensuring the sustainable management of natural resources, and climate action, and 3) achieving a balanced territorial development of rural economies and communities including the creation and maintenance of employment.

On the basis of an analysis of the needs of the territory covered by the RDP, member states/regions set quantified targets and measures to achieve these targets, upon following common EU priorities [Reg. (EU) No. 1305/2013]:

- fostering knowledge transfer and innovation in agriculture, forestry and rural areas;
- enhancing the viability / competitiveness of all types of agriculture, and promoting innovative farm technologies and sustainable forest management;
- promoting food chain organization, animal welfare and risk management in agriculture;
- restoring, preserving and enhancing ecosystems related to agriculture and forestry;
- promoting resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors;
- promoting social inclusion, poverty reduction and economic development in rural areas.

Based on strategic development priorities from the Regional Development Strategy of the Timočka Krajina Region [Regional Development Agency Eastern Serbia - RARIS, 2011], three key thematic areas of development for Eastern Serbia: 1) agriculture and rural development, 2) tourism and 3) environmental protection were defined in the Regional EU platform [RARIS, 2015].

In the field of agriculture and rural development, measures of agricultural policy are grouped within the three strategic objectives: 1) strengthening the competitiveness of agricultural production and agro-industry, 2) sustainable management of natural resources and environmental protection, and 3) diversification and development of the rural economy, in line to the strategic objectives and priorities of the national Strategy for agriculture and rural development 2014-2024 [Official Gazette of the Republic of Serbia - OG RS, no. 85/2014], as well as to preference, expressed in the Strategy for gradual harmonization of policy for management of the development of agriculture and rural areas with the principles of the EU CAP.

With the intention to establish the stimulating conditions for the realization of mentioned strategic development aims and measures, certain number of priority activities as a part of agricultural policy that are of interest to the agricultural sector and rural areas of the Eastern Serbia region during the EU accession process were singled out and recommended. Priorities are related to: zoning of agricultural production; development of a regional forecast-reporting service for plant protection; defining of the legal framework for the areas of integrated production, irrigation and producer associations; protection of geographical indication of agricultural products; establishment of farm management information system and formulation of local strategies for sustainable agricultural and rural development [RARIS, 2015].

8.2 Data sources and methodology

In paper have been discussed the potentials and limitations for the development of agriculture and related activities in the Region, as well as all the needs for the state improvement by taking a set of recommended measures have been explained.

The analytical-synthetic method is used for a discussion and concluding remarks. Data are obtained from various relevant sources – official statistics, projects reports, sectoral and development strategies and spatial planning documents. Several scientific papers and studies were analysed and quoted as well as official regulations.

8.3 Challenges and opportunities for regional agriculture and rural development

Geography and basic economic indicators

Region Eastern Serbia (also known as the Timočka Krajina) outspreads between the Danube River at the north and the Stara Planina Mountain at the southeast, in the valley of Timok River, along the border with Romania and Bulgaria.

Region covers the administrative territory of the Bor District (municipalities of Bor, Negotin, Kladovo and Majdanpek) and Timok District (Zaječar city and municipalities of Knjaževac, Sokobanja and Boljevac), with the total area of 7,131 km^2 and population of approximately 238.6 thousand inhabitants [Statistical Office of the Republic of Serbia - SORS, 2014], (Picture 1).

Picture 1. Region of Eastern Serbia – geographical location and administrative coverage

Source: http://www.traveleastserbia.org/
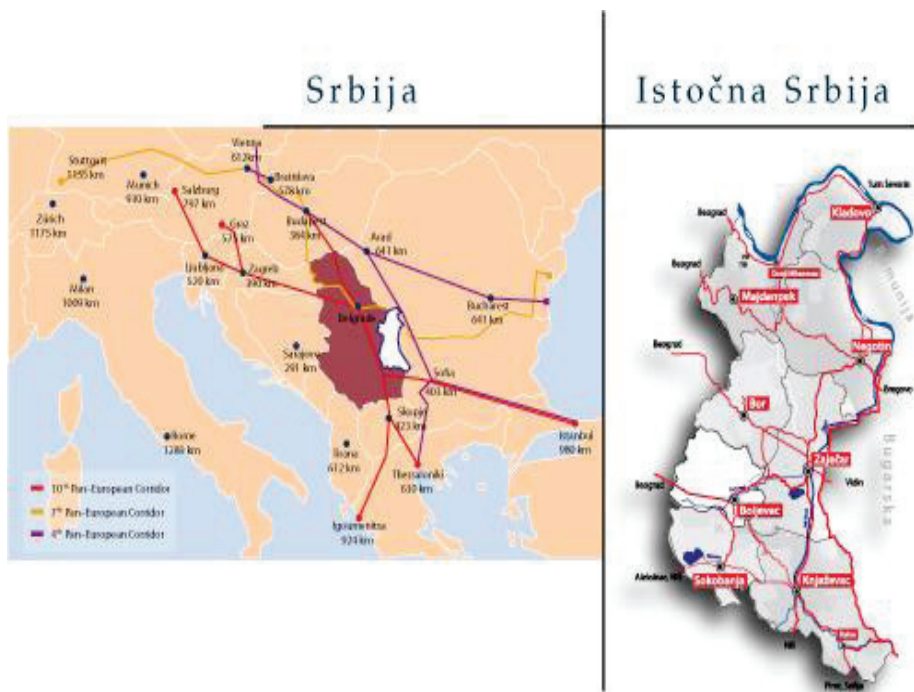
In relief dominate mountainous and hilly terrains, framing the region from the east, west and south sides (high mountain massif of Stara planina and medium height mountains - Kučaj, Deli Jovan, Rtanj, Tupižnica, Ozren, etc.); river valleys of Danube, Beli, Crni and Veliki Timok, and Sokobanjas' Moravica, in which are compositely changing gorges and basins; and Danube River alluvial plain and terraces at its entrance to Dakijas' basin, between Kladovo municipality and the mouth of the Timok River. The territory outspreads in several altitude zones, from 28 m.a.s.l. (mouth of the Veliki Timok River into the Danube River, the lowest point in Serbia) to the 2,070 m.a.s.l. (part of the Stara Planina Mountain within the Knjaževac municipality).

The climate is continental, with the expressed temperature extremes, large variations in rainfall and unfavourable distribution of rainfall during the year [Aleksić et al., 2004].

This is mostly agricultural area with an economy based on natural resources (energetics and mining) and significant tourism potentials (Danube River and Stara Planina Mountain). Sector of agriculture, forestry, water manage-

ment, hunting and fishery makes 43.7% of the Region GDP, while sector of mining, energetics, processing industry and construction has a share of 26.3%, and sector of services around 30% [OG RS, no. 51/2011]. Mining is developed in municipalities of Bor and Majdanpek, energetics and chemical industry is characterized for municipalities of Kladovo and Negotin, while food, textile, footwear and machine industry are the most common for Knjaževac municipality and city of Zaječar. Municiplaity of Sokobanja is mostly recognized by developed spa tourism. Generally, development of small and medium enterprises is too slow, with the predominant share of trade and restaurant business.

Regionally observed higher GDP per capita than the national average in 2014 was recorded in the municipality of Bor; in Zaječar city and Majdanpek municipality this indicator exceeded 80% of the national average; in municipalities of Boljevac, Kladovo, Negotin and Sokobanja it ranged from 60-80% of the national average, while in least developed municipality Knjaževac, it did not exceed 60% of the national average [OG RS, no. 104/2014].

Land use

Agricultural area covers 49.4% of territory of Bor District (from 22.2% in municipality of Majdanpek to 68.0% in municipality of Negotin), while in District of Zaječar mentioned percent is little higher, and amounts 59.0% (from 46.3% in Boljevac municipality to 67.7% on the territory of Zaječar city), [SORS, 2014].

According to data from Census of agriculture 2012 [SORS, 2013], from 29,286 agricultural holdings within the Region of Eastern Serbia, there are 29,078 holdings that have at disposal 157.676 ha of utilized agricultural area (UAA). Agricultural holdings are small and fragmented what hinders the use of modern technology and mechanization, as well as makes agricultural production more expensive. Average size of UAA per holding, on the territory of the Bor District is 5.81 ha, divided in average in 6 separated parcels, while on the territory of Zaječar District it is 5,07 ha (in 8 separated parcels). There prevail small family holdings, with size up to 5 ha of UAA (65.8%), where they have at disposal only 26.6% of total sum of utilized agricultural area. The largest part of UAA (58.7%) is managed by 34% of holdings whose estate ranges from 5 to 50 ha, while remaining 14.7% of UAA is at disposal of only 0.2% large holdings (larger than 50 ha).

Among the holdings of last two mentioned groups, there are a significant number of market-oriented family holdings, which are by incomes capable to invest in intensification of agricultural production and purchase of modern equipment and mechanization. Currently to mentioned groups, after many years

of stagnation caused by the transitional difficulties in process of restructuring and privatization, are turning back some of former large public agri-combines – carriers of agriculture development within the region, and now successful private companies, such as "Salaš" d.o.o. from Zaječar, in Italian ownership (http://ruskiposlovniklub.rs/en/ news.htm#newsPartners).

After the breakdown of several large public agri-combines in observed area, which had also possessed the storage facilities and processing capacities, and after the shutdown of agricultural cooperatives during the transition period, farmers were faced with difficulties in products sale and strong price and income fluctuations, which were results of the broken market chains. Local associations of crops and fruits producers, wine growers, stockbreeders and beekeepers have been strengthened in recent years, but this is only a small indication of what would they eventually have to become – regional branches of strong and organized producers' groups and organizations, which will represent the interests of all farmers of Timočka krajina region towards processors, large trade chains, exporters and state authorities.

Every seventh holding (4,184 holdings), has diversified activities and sources of income, primarily in the field of agricultural products processing (processing of milk, fruits, vegetables, meat and other agricultural products) and forestry, where some of them are engaged in tourism, handicraft, fishing and energy production from renewable sources [SORS, 2013]. According to available natural resources and rich cultural heritage, soon can be expected tourist valorisation of rural areas and within it promotion and protection of the origin of traditional local products [Popović et al., 2010; Popović et al., 2012].

Depopulation and migration processes outside the country, as the consequences have unfavourable age and qualification structure of the population linked to the holdings, what generally discourages market orientation and diversification of economic activities. On agricultural holdings live and work 70,244 inhabitants, where 69,835 of them are on family holdings, while 409 persons have a status of full time employees at the holdings of legal entities and entrepreneurs. Households with 1-2 members have a share of 63.7% within the total number of households, while those one with 3-4 members participate with 31.1%. Around 41.7% of household population has a role of a holding manager. Agricultural secondary or higher education, or agricultural faculty has only 2.6% managers, courses from the field of agriculture attended around 0.6% of them, while 72.5% of managers run business according to their previous experience gained in agricultural practice.

Arable land, including kitchen gardens, occupy 57.2% of utilized agricultural land, orchards 3.3%, vineyards 1.4%, while meadows and pastures around

38.1% of UAA. At totally 89,112 hectares of arable land (without kitchen gardens) dominate grains (62.6%), followed with forage crops (26.2%) and industrial crops (6.8%). Vegetables (peppers, cabbage, onion and tomato), melons and strawberries, potatoes and pulses are grown on 2% of arable land. The largest area under grains are occupied by wheat and maize, and they are mostly located in the area of Negotin, Zaječar and Sokobanja; areas under forage crops, mostly covered by alfalfa and clover, are located at the territory of Zaječar, Boljevac and Bor; while within group of industrial plants, dominates sunflower, before all in Negotin, Kladovo and Zaječar. Vegetables (peppers, cabbage, onion and tomato) and melons are usually cultivated in Negotin and Zaječar; while potatoes and beans are more common in Knjaževac and Sokobanja.

Under irrigation is 2,327 ha, or 1.5% of UAA (at national level mentioned percentage is 2.9%). Arable land is over the 90% of irrigated areas, while rest of them are under orchards (148 ha), meadows and pastures (12 ha), vineyards (9 ha) and other permanent crops (11 ha). The most of irrigated arable land was sown with grains and maize for fodder (1,523 ha), but this is only 2.7% of the total area under mentioned crops. They are followed by areas under vegetables, melons and strawberries (302 ha) with much higher share in the total areas under mentioned crops (40.1%), having in mind that presented share is below the national level, 63.8%. The largest part of irrigated arable land and orchards is in the city of Zaječar, as well as in Negotin and Knjaževac municipality.

Besides the ongoing projects of revitalization and upgrading of large irrigation systems in the Negotin plain and Zaječar (PIK Salaš), and evident need for the realization of the project of water accumulation construction in Knjaževac, it is necessary to build a accompanying energetic infrastructure, which lack greatly limits the use of water for irrigation in the villages within the valley of Timok River.

Fruit plantations are spread over 5,133 ha, where 2,611 ha are under intensive and 2,522 ha under extensive plantations. Plums occupy the largest part of the fruit areas. They are followed by sour cherries, apples, walnuts and pears. Plums are mainly grown in the municipalities of Knjaževac, Bor and Zaječar; sour cherries in Knjaževac and Zaječar; apples in Negotin, Zaječar and Bor; walnuts in Zaječar, Knjaževac and Bor; while pears dominate in Bor, Zaječar and Negotin.

Vineyards cover 2,169 ha of UAA, where only 3% of these areas are planted with wine varieties with geographical indications, 86.4% are occupied with other wine varieties, and remaining 10.6% are table grape varieties. The largest areas under vineyards are located at the territory of Negotin, Zaječar and Knjaževac.

Zoning of fruit production and application of integrated and organic system of production, renovation and construction of irrigation infrastructure, permanent education and establishment of producers associations, strengthening of the family wineries and development of wine tourism are the main tasks for the improvement of fruit and wine growing.

Meadows and pastures outspread on 60,093 ha. The largest areas under permanent grassland are located on the territory of Bor and Boljevac municipalities. Larger areas are also on disposal to the city of Zaječar, and municipalities of Knjaževac, Majdanpek and Negotin. The best quality meadows are in Sokobanja, and pastures in municipality of Majdanpek. To them can be added the row of pastures at Crni vrh (Stara Planina Mountain), that are good for grazing of sheep and dairy cows [RARIS, 2010].

Protection of biodiversity and advancement of the production potential of natural meadows and pastures, as a part of comprehensive program for restoration and development of livestock production, especially livestock production based on grazing, as well as the diversification of the rural economy (production of traditional meat and dairy products, fruits, forest fruits and medicinal herbs, protection of products origin and development of rural tourism) are of great importance for the conservation of agro-ecological goods and services located at the vast mountainous landscapes of the Timočka krajina region.

Livestock production is insufficiently developed, especially on the territory of Bor district (39 livestock units (LU) per 100 ha of UAA), while in Zaječar district situation is somewhat more favorable (52 LU per 100 ha of UAA) and it is closer and closer to the national average (59 LU per 100 ha of UAA). The most of livestock is grown at the territory Zaječar city. The highest number of cattles is in Zaječar and Bor, pigs and poultry in Zaječar and Negotin, and sheep and goats in Zaječar and Knjaževac. Close to 40% of sheep and goats are raised on grazing (at national level around 25%), (SORS, 2013). There are considerable unused potentials for the development of organic livestock production in mountainous areas (Katić et al., 2010). Region of Timočka krajina is known for the production of high quality honey. Most hives have been located at the territory of the Zaječar and Knjaževac municipalities [SORS, 2013].

Having in mind available areas under meadows and pastures, as well as potentials for growth in production of maize, forage crops and oilseeds under the irrigation, tradition and market opportunities, livestock production represents large but unexploited chance for agriculture at this territory.

Land-use planning

The purpose of zoning, as carried out for rural land-use planning, is to separate areas with similar sets of agro-ecological and socio-economic potentials and constraints for development. Specific programmes can then be formulated to provide the most effective support to each zone.

According to criteria of prevailing terrain altitude and slope at the level of cadastral municipalities (CM), on the territory of the Timočka krajina, next four agricultural areas can be singled out:

- lowland, up to 200 m.a.s.l. – covers 8% of the total agricultural land in the Bor District (territory of of Ključ and Negotin plain); fertile land suitable for intensive crop and vegetable production;
- knolly, from 200 to 350 m.a.s.l. – covers 33.7% of the total agricultural land (17.2% within the Bor District and 16.5% in Zaječar district); land on the lower terrains are particularly suitable for grapes growing, while at the higher terrains for fruit production;
- hilly, from 350 to 600 m.a.s.l. – covers 33.0% of the total agricultural land (12.1% in the Bor district and 20.9% in the Zaječar district); lands are with heterogeneous production potential, suitable for mixed livestock and inte-grated fruit production;
- mountainous, over 600 m.a.s.l. – includes 25.3% of total agricultural land (6.1% in the Bor district and 19.2% in the Zaječar district); lands are with se-rious constraints to agricultural production, suitable for livestock grazing.

Starting from the agro-ecological conditions and specific structural, tech-nological and socio-economic limitations and potentials, and having in mind the priority directions of the spatial distribution of agricultural production within the territory of Bor and Zaječar districts that are defined in the Spatial Plan for the Republic of Serbia 2010-2020 [OG RS, no. 88/2010], by the Regional Spatial Plan for the Timočka krajina region [OG RS, no. 51/2011] are determined fol-lowing agricultural or rural zones:

- zone of intensive agriculture – includes fertile land of Ključ and Negotin plain, as a part of the valley- knolly and basin areas, mostly up to 350 m.a.s.l. With the application of anti-erosion measures, hydro meliorations and pre-vention of soil conversion to non-agricultural purposes, in mentioned zone is possible to organize different types of intensive plant and livestock produc-tion, which should be supported by restoration and construction of additional storage and processing facilities;
- zone of wine-growing – 1) wine-growing region of Negotinska krajina, with the Ključs', Brzapalankas', Mihajlovacs', Negotins' and Rogljevac-Rajacs'

vineyard areas and 2) wine-growing region of Knjaževac with Bors', Boljevacs', Zaječars' and Potrkanjes' vineyard areas. Zone has a perfect microclimate and soil conditions, as well as multi-century tradition of grapes growing and wine production. There is a need for continuous support to improvement of technical and technological conditions for the grapes and wine production;

- polymorphic zone – covers hilly areas, located mainly at the higher altitudes (350-600 m.a.s.l.). According to complex geophysical conditions, zone is extremely heterogeneous in terms of benefits and constraints for agricultural production. It is suitable, primarily for the development of mixed livestock breeding (cattle-goat-sheep breeding), parallel with the improvement of forage base, in order to produce quality meat and milk, as well as for the development of fruit growing in the system of integrated production;

- zone of livestock grazing – cover areas, which are mostly located at the heights above 600 m.a.s.l. Spacious natural pastures predispose mentioned zone for the development of livestock grazing and organic production of local varieties of fruits, together with support to production improvement and protection of the origin of traditional local products, linked with the development of rural and ecotourism. Depopulation and poor accessibility to the remote mountain villages are basic limitations to sustainable use of agricultural resources in mountain areas.

Despite general zoning and definition of priority directions of the spatial distribution of agricultural production and accompanied activities at the territory of Timočka Krajina, in regional spatial plan is noted that by multisectoral approach the borders of mentioned zones have to be specified, spatially differentiated support measures for improvement of agricultural production competitiveness, agri-environment protection and diversification of rural economy have to be determined, in order to eliminate resource, structural, technological and socio-economic limitations of agricultural and rural development.

The best way for achievement of mentioned is throughout the framework of local development strategies and programs of integrated rural development, which respect the territorial heterogeneity and specific socio-economic and environmental needs of local communities (Popović, 2003). In this context, it is particularly important to ensure adequate professional and advisory assistance to farmers, as well as certain support to capacity building of stakeholders for the establishment of local development strategies and programs (Popović et al., 2009; Popović et al., 2011).

8.4 Recommendations for priority measures to support agriculture and rural development

Starting from the previously considered potentials and limitations for the development of agriculture and rural development, within the Timočka krajina, some essential priority activities of agricultural policy in mentioned area will be presented[17].

Zoning of agricultural production

Agro-ecological zoning (AEZ), as applied in FAO studies, defines zones on the basis of combinations of soil, topography and climatic characteristics and the management systems under which the crops are grown. Each zone has a similar combination of constraints and potentials for land use, and serves as a focus for the targeting of recommendations designed to improve the existing land-use situation. Combined with an inventory of land use, expressed as land utilization types and their specific ecological requirements, zoning can be used as the basis of a methodology for land resource appraisal. Ecological-economic zoning (EEZ) approach complements elements of physical-biotic environment with socioeconomic factors and a wider range of land uses in zone definition and matching both of them through multiple goal analysis, provides a tool for land users to reach a consensus on the optimal use of land (FAO, 1996).

By macro and micro zoning of agricultural production is monitored and encourages specialization of agro-industrial production, linkaging based on interests, inclusion of small producers in market trends, better evaluation of work in agriculture (through balanced employment of all members of agricultural holding) and optimal use of natural resources. It is also a practice in the EU, where by zonal politics had been influenced on farms and UAA parcels enlargement.

For zonal deployment of agricultural production and additional activities, it may be used two methods with corrective factors: territorial marking of zones (based on altitude, relief and climate), and zonal marking of certain lines of agricultural production according to their representation at particular territory (share in the total area) [RARIS, 2015].

Zoning has strategic importance for the successful use of comparative advantages and sustainable development of multifunctional agriculture, including agro-

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[17] Mentioned priority activities are among the recommendations defined for *agriculture and rural development* thematic area by the local stakeholders, members of the Regional EU platform, with the support of external consultant, the author of this chapter, within the RARIS project "Active Eastern Serbia in the accession process to EU" (2014-2015).

ecotourism and other accompanying activities in the rural economy, which are, according to the rich natural resources and cultural heritage, of particular interest for the development of agriculture and villages in the region of Timočka Krajina.

Legal framework for integrated agricultural production

There is wide variation of integrated farming approaches which cover production systems positioned between conventional and organic food production. Integrated farming encourages farmers to look at the whole farm and its relationships with the wider socio-economic and ecological environment, combining the best of traditional and modern production practices. No Community-wide regulation exists on integrated farming[18]. This has led to national and regional authorities developing their own production and marketing standards, which they enforce with the aid of duly accredited certifying bodies (EC, 2011).

Countries within the region arranged area of integrated production by certain regulation, which defines responsibilities of producers and prescribed technical and organizational production conditions, adequate organization of products control, certification and labelling, etc. Integrated production is mostly present in fruit, vegetable and wine growing. Due to the excellent predispositions of spacious hilly-mountainous area, within the Timočka Krajina, for integrated fruit production, and more and more presented market requirements for quality wines gained from integrated production, establishment of mentioned legislation will have significant importance for the fruit and wine growers, as well as for other agricultural producers from this region.

Legal framework for establishment of producer groups and organizations

Producer organisations are legally-constituted groups of farmers and growers that assist in the distribution and marketing of products, promote a higher quality of products and encourage their members to adopt good environmental practices. Producer organisations can group themselves into associations of producer organisations and into inter-branch organizations, which link their activities in the production of food to the processing and trading. It has especially important role in organization and purchase of fruit and vegetable.

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[18] The Framework Directive on the sustainable use of pesticides (Directive 2009/128/EC) only regulates the plant protection element of integrated farming, i.e. integrated pest management (IPM). The general principles of IPM are implemented by all professional users since 1st January 2014. Member States are required to encourage professional users to implement crop or sector specific guidelines for IPM on a voluntary basis. The harmonization of Serbian legislation with EU Directive 2009/128/EC is in progress [EIO, 2014].

Since the 2013 reform of the Common Agricultural Policy (CAP), producer organisations are encouraged in all sectors. Reinforced legal framework for Producer Organisations within common organisation of the markets in agricultural products (such as temporary exemption from certain competition rules, the possibility for collective bargaining in some sectors and delivery contracts for all sectors) is backed by financial support to for setting up producer groups under the second CAP pillar (EC, 2013).

This is a missing segment within the entire region of Eastern Serbia, having in mind the large number of small size agricultural holdings, their disorganization, and non-standardized and fragmented agricultural production. Producers' organizations and clusters are the promoters of their own interests, but also the factors of agricultural policy creation and implementation that is adjusted to the customers and market needs.

Legal framework for establishment of energetics infrastructure for
hydro-amelioration

By organized construction of low-voltage network, in areas where the need for use of hydro-amelioration exists, it will come to costs reduction and improvement of irrigation efficiency. Adoption of rulebook that regulates the construction of low voltage network system in function of hydro-technical amelioration encourages the yields growth and sustainable land management in agriculture. Regulations would define the activities related to establishment of planning documentation, obtaining needed permits, coordination with relevant public companies, coordination and monitoring of activities implementation and monitoring of systems' work.

Adoption of mentioned regulation is particularly important for the region of Eastern Serbia, where is present a lack of electrical grid for power supply of irrigation pumps (just a few of agricultural producers use the electricity for the operation of electric pumps for irrigation in the Timok river valley).

Establishment of regional forecasting and reporting service
for plant protection

Basic tasks of regional forecasting and reporting service for plant protection is a prediction of appearance and determination of developmental phases of harmful organisms and plant diseases, evaluation of their impact on agricultural production, establishment of a forecasting model, as well as undertaking of optimal measures in crops protection against harmful organisms, according to constant monitoring of their number, spatial and temporal distribution of their hosts

and environmental conditions. Optimal plant protection measures guarantee food safety and lower crop care costs, and protect the environment. They also have particularly important role in the system of integrated plant production.

Development of forecasting and reporting service for plant protection, within the region of Eastern Serbia, represents significant segment in strengthening of the field crop, fruit and wine production competitiveness. The consequences of mentioned service non-functioning are reflected in the lack of knowledge related to pests' appearance and movement, application of inappropriate pesticides and use of pesticides outside the biological justification. In accordance to that, most often is received unhealthy and unsafe product, which contains pesticides in quantities above allowable levels, what leads to pests' resistance and jeopardizes export.

Protection of geographical origin of regionally recognizable products

By origin protection agricultural products gain some level of added value, they become more competitive in the market and achieve higher price categories, what at the end leads to an increase in production and export volume, as well as to increase of producers' income. According to data from April 2014, 336 spirits, 1,577 wines and 1,184 agricultural products were protected in EU. It is estimated that during the 2010, mentioned products were sold in total amount of 54.3 billion EUR, where 11.5 billion was realized throughout export, what is around 15% of export of EU food and beverage industry (EurActiv, 2014).

Indications of geographical origin of agricultural products in EU[19] – Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI) are most common in the Mediterranean EU Member States (Italy, France, Spain, Portugal, Greece) in production/processing of fruits, vegetables and cereals, cheeses, fresh meat and meat products, oils and fats, as well as in production of bread, pastries and cakes, eggs, honey, spices, mineral water, beer, fish and seafood (Rastoin, 2009).

Equivalent system of protection has been established in Serbia (appellation of origin and geographical indications), where 52 agricultural products with geographical indications are registered at national level, with it that just four products come from the region of Eastern Serbia: cheese from Krivi Vir and Stara Planina, Rtanjs' tea and Kladovos' caviar. International protection, according to ratified Lisbon Agreement for the Protection of Appellations of Origin and their International Registration (OG FRY – International Treaties,

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[19] Non-alcoholic beverages, aromatic wines and other grape products, except wine vinegar (Regulation (EU) 1151/2012).

no. 6/1998), refers only to three Serbian products (honey from Homolje, wine Bermet and homemade chutney from Leskovac). Law on Indications of Geographical Origin (OG RS, no. 18/2010) regulates application procedures for international registration of indication of geographical origin in accordance to international agreement that obliges Serbia to register it on the level of the European Community, in accordance with the European Community regulation governing the protection of indications of geographical origin for agricultural products and foodstuffs[20] (Regulation (EU) 1151/2012).

Producers need greater government and extension service support, both in process of protection and in process of products with protected geographical origin marketing valorisation. Holders of protection are usually associations of (small) producers, which have neither the financial possibilities, nor the knowledge to successfully sell the protected product, especially in foreign market.

Products with geographical indications contribute the recognisability of the region where they are produced, encouraging on that way the development of rural tourism. Therefore, it is important to achieve the synergy among the strategies of products with geographical indication value chain development with local developmental strategies.

Establishment of local strategies of sustainable agricultural and rural development

In the region of Eastern Serbia in force is one strategic document turned to agricultural development (Strategy of Agricultural Development of Boljevac municipality for period 2010-2015) and one focused on rural development (Strategy of Rural Development of Knjaževac municipality for the period 2010--2020). As each local government should determine the best modalities of sustainable agriculture and rural development, recommendation is that initiation of establishment of relevant developmental documents should be based on participatory approach, with joint action of agricultural producers, citizens and other stakeholders interested for the goals and directions of development, as for investment in local community development.

Implementation of the EU LEADER approach, which is based on the establishment of local action groups, composed of representatives of farmers, SMEs and entrepreneurs that are active in the area of agriculture, scientific-research institutions and other stakeholders, is imposed as the best solution in

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[20] Agreement between the Community and Serbia on the reciprocal recognition, protection and control of wine, spirit drinks and aromatised wine names has been included in the Stabilization and Association Agreement between the EU and Serbia (Annex II to Protocol 2) (OG RS – International Treaties, no. 83/2008).

the process of developing of local strategy of sustainable agriculture and rural development. Only with close cooperation among stakeholders, it is possible to set a realistic SWOT matrix of internal resources and developmental constraints, in the context of opportunities and threats of environment, and then to define the goals of development and investment activities for their realization.

8.5   Conclusions

Region of Eastern Serbia is outspreading between the Danube River in the north and Stara Planina Mountain on the south-east, within the Timok River valley, along the border with Romania and Bulgaria, with the total area of 7,130 square kilometres, where live around 238.6 thousand inhabitants. It is mostly agricultural area, where economy is based on natural resources (energetics and mining) and significant touristic potentials (Danube River, Stara Planina Mountain). Region is characterized by depopulation processes, unfavourable age and qualification structure of the population, especially population linked to the agricultural holdings, significant spatial imbalances in level of development and allocation of industrial (economy) capacities, generally low level of economic activity and investment, high unemployment, small and fragmented agricultural holdings, degradation of environment by mining activities, underdeveloped market infrastructure and poor transport accessibility of remote hilly--mountainous areas.

In order to create an stimulating environment for the development of agriculture and rural areas of Eastern Serbia Region during the accession process to the EU, the following activities should be done: zoning of agricultural production; to advance the development of regional forecasting and reporting service for plant protection; to define the legal framework for the areas of integrated production, irrigation, as well as for the establishment and strengthening of producers' associations; to protect the geographical origin of local agricultural products; and to establish and implement local strategies of sustainable agricultural and rural development.

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9. Economic and social aspects of Slovak agri-food sector

9.1 Introduction

The Slovak agri-food sector as all the Slovak economy has passed a large changes meaning the new challenges. The EU integration set up the Slovak agricultural and food processors to the greater competition in the domestic market and caused extensive options of the Slovak enterprises to easier implement the results of their production on the common European market.

Since 1989 the development of the agricultural population has undergone a significant descendent trend and is headed toward the complications of the re-productive base in the agricultural labour forces. Another remaining obstacles by Buchta, S. (2013) is to ensure the stabilization of sufficiently educated work-force that is supposed to be important for the economic growth and innovative development of the industry. Considering the slow job-creation a substantial part of the unemployed population relies on the wide social network. The inability of the Slovak economy to create employment opportunities for marginal workers, including a significant number in agriculture, has not improved in recent years.

Chrastinová, Z. (2015) reported that the social aspect of agriculture was understood in terms of employment, reproduction of labour force, wage levels and education. Creating the new jobs in agriculture plays a minor role compared to other sectors of the national economy, but in the rural economy and employ-ment is crucial. The perspective of agricultural employment will depend on in-creasing agriculture production performance, intensity and modernization of the sector, improving human capital and diversified use of internal development po-tential in rural economy. Differences in the social issues emerge between legal entities and self-employed farmers. In both cases, the processing efficiency is significant. While the legal person cooperate with an employment, the self-employed farmers provide labour on farms mostly with their family members. In addition, work in agriculture requires seasonal labour force and is valuated rela-tively low, it is more of a work by means of agreements.

The basic reason of a lack of interest of young people in agricultural work despite a progress is according to Jamborová, M. (2015) caused by low financial and social assessment of work, difficult working conditions and the unequal

work distribution in the year. Hence, in order to support the employment it is essential to promote a generation change of agricultural workers by favouring projects contributing to the improvement of the age structure and educational level of the workforce, or support young farmers. In view of the natural and climatic conditions, Slovakia has a potential to achieve greater production volume than used for the domestic agro-food market. In many rural areas of Slovakia the agricultural primary sector is still a crucial employer and source of income for the local population. An increasing interest in agricultural work also influences the 'modernization' in the field of study and production diversification and employment orientation for the winter months, production according to local conditions and the overall development level of rural life. Matošková, D., Galik, J. (2014) reported that the food industry was an important sector of industrial production, which performed several functions in the context of agrokomplex. It acts as a main customer of agricultural commodities of domestic or foreign origin, provides processing, produces food products and is involved in food supplies to the population. Its social aspect is important as well as the food and drink production contributes to the total employment of approximately by 2%.

According to Krížová, S. (2014), one of the social aspects is the purchasing power of the population linked to the pensions and goods price. Purchasing power is measured by a disposable income (including any received state benefits) after the deduction of taxes and charitable contributions and represents the amount of funds available to the consumer for any costs associated with the individual components of the consumer basket.

9.2   Methodological approach

The paper is focused on selected economic and social aspects of agriculture and food industry. A database of the Statistical Office SR and database of the Ministry of Agriculture and Rural Development SR (Information sheets, Food report) were used for the analysis. The basic mathematic-statistical methods, analysis and synthesis, index method and comparative analysis were used for solving the topic. The aim was to find out what changes in selected indicators of social development of agriculture and food industry (employment, wage levels) evokes selected economic aspects of agriculture and food industry (i.e. economic result, production, investments – tangible and intangible assets, benefits and other indicators). Panel Data represent observation of various phenomena in time series. Mathematical formulation of the issue is presenting by

Lukáčik, Lukáčiková, Szomolányi (2010). A basic regression model for panel data considered by Greene (2003)[21]:

$$y_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + \ldots + \beta_k x_{itk} + \alpha_1 z_{i1} + \alpha_2 z_{i2} + \ldots + \alpha_q z_{iq} + u_{it} \ ,$$

where: the index i denotes the cross section dimension i = 1, ..., n, the index t time dimension t = 1, ..., T, variables X_1 to X_k are explanatory non-vector-variables and variables Z_1 to Z_q represent individual effects – a diversity that can distinguish an individual or a whole group from the other entities – here is classified with potential vector units. Individual effects do not change in time.

Due to the availability of relevant data detailed analysis of the socio--economic situation in the food industry was made from the database of sectoral statistics excluding tobacco and feed industry.

9.3   Economic-social aspects of agriculture

In terms of the tradition Slovakia was considered to be an agricultural country but under the influence of the economic transformation many significant changes and gradual decline of agriculture were noticed. Hence, an industrial production has kept preferences, which caused the agriculture receded into the background and reached the limits of efficiency. This influenced the employment in rural areas. Of the total area of Slovakia, the largest share of 59% is mainly rural, 36.8% share represents intermediate regions and the lowest share of 4.2% predominantly urban regions (Table 1).

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[21] Authors cite the source as: GREENE, W. H.: Econometric Analysis, 4th editiond. New Jersey: Prentice-Hall, 2003.

Table 1. Share of rural inhabitants and rural areas in Slovak Republic by the new urban-rural typology (31st December 2013)

Region	Area in km^2	Share of the total area of SR, in %	Number of regions' inhabitants	Share of the total inhabitants of SR, in %
Predominantly urban regions	2,060	4.2	606,586	11.2
Intermadiate regions	18,045	36.8	2,729,724	38.4
Predominantly rural regions	28,931	59.0	2,729,638	50.4
Total of SR	49,036	100.0	5,415,949	100.0

Source: Eurostat; Statistical Office SR, calculations of NAFC-RIAFE (National Agricultural and Food Centre – Research Institute of Agricultural and Food Economics).

By 1990, the agriculture had in addition to production also an important social function in the Slovak countryside. It was the main and often the only employer. The situation has changed after 1990. The strong decline in labour force occurred in the first years of agricultural transformation and later due to the mechanization within the RDP 2007-2013, saving labour costs and changes in the structure of plant and animal production in relation to market measures after the Slovak EU accession. Although the decline of workers has slowed in recent years, the ratio of the average registered number of workers in agriculture in the total number of the national economy decreased from 12% in 1990 to 2.2% in 2014. A decreasing trend continued until 2014, when a year on year growth of agricultural workers increased by 1.8% to 51.5 thousand persons. (Table 2, Figure 1).

Table 2. Development of labour force in agriculture and food industry in thousand persons

	2008	2009	2010	2011	2012	2013	2014
Agriculture, forestry and fishery	96.3	84.9	75.0	71.3	75.4	77.1	82.7
- of what agriculture	60.2	59.7	54.9	52.8	51.6	50.6	51.5
Food industry	56.3	60.1	55.3	48.9	48.5	57.7	50.2
Total – agriculture, forestry, fishery and food industry	152.6	145.0	130.3	120.2	123.9	134.8	132.9

Source: Statistical Office SR, calculations of NAFC-RIAFE.

Job evaluation of workers compared with other sectors is consistently lower in the agriculture sector. The average wage in agriculture oscillates at about 70-80% of the average wage in the national economy. While in 1989 the average monthly wage in agriculture exceeded wages for all sectors of economic activity by 6.8%, in 2014 it reached only 76.4% within agricultural organizations with more than 20 workers. This development also affects the social level of rural population due to the lower retirement pensions. This leads to a long search for alternative sources of living in the form of self-sufficiency, and consequently in improving the social situation and living standards of the rural population.

Figure 1. Development of the agricultural and food employment in thousand persons
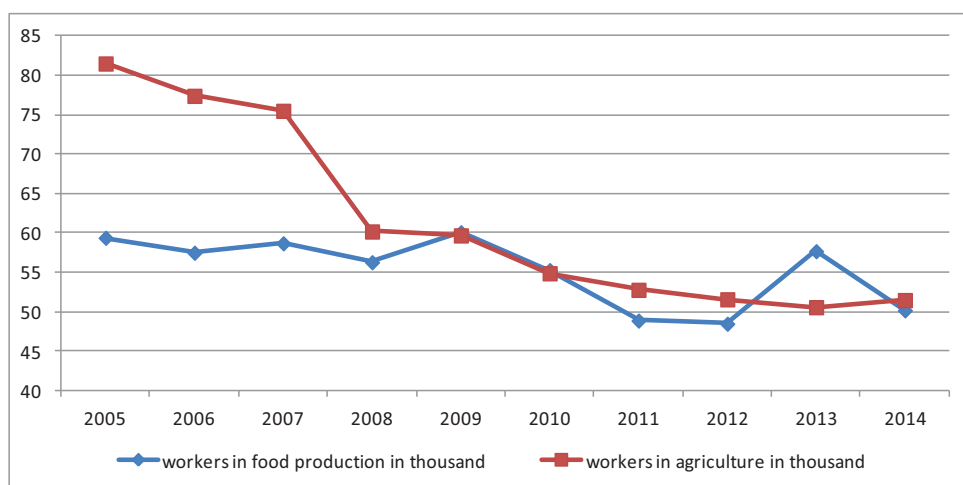
Source: Statistical Office SR (Labour Force Sample Survey).

Macroeconomic situation in the food industry after 2008 was more stable compared to agriculture, although the trend in the share of added value in the national economy decreased from 1.8% in 2008 to 1.3% in 2013. This is caused by the trade liberalization, the pressure of commercial chains on their suppliers and high import of food products that could be produced in Slovakia as well. It has resulted in reducing food production in different fields. On the other hand, the low competitiveness of Slovak products in the domestic and foreign markets results as a high value of a negative balance of foreign trade in food products.

This trend, in turn, affected the employment where the share of food industry in the national economy fell from 2.3% in 2008 to 2.1% in 2014. Development of employment in the food industry was of a more moderate decline than in agriculture; it declined from 56.3 thousand persons in 2008 to 50.2 thousand persons in 2014, while in 2007, 2009 and 2013 an increasing number of

employees occurred in the sector. Share of employed women in agriculture fell by 2.8 p.p. to 25% in 2014 compared to 2008. In the food industry the decline was more significant, by 3.5 p.p. to 48.4%.

Unlike agriculture, wage parity in the food and beverages industry achieves a higher level compared to the average of the national economy by about 20 p.p. While in 2008 it reached 87.9% of the national economy wages, in 2014 it increased to 95.5%. Differences in a work valuation of both sectors are closely related to differences in the qualification structure of labour forces (Figure 2, Table 3).

Table 3. Development of the average nominal wages in € per employer

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Total of economic sectors	788	808	840	854	901	916	968
Agriculture (plant and animal production)	585	598	601	641	675	673	740
Food and beverages industry	693	810	838	846	891	890	924

Source: Statistical Office SR.

Figure 2. Development of average wages in €
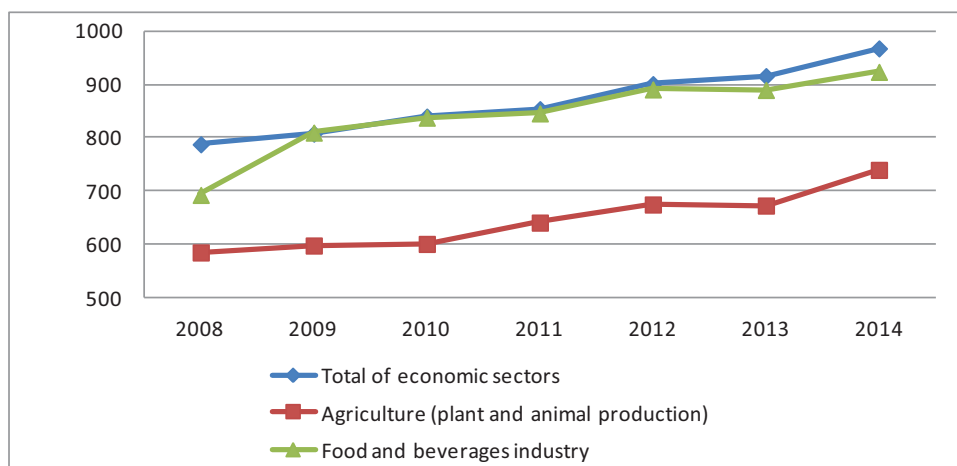
Source: Statistical Office SR.

Living conditions of the population and a sustainability of the economic life in rural areas of Slovakia are to a large extent affected by the economic performance of agriculture even today. In Slovakia, there are great regional differences. In the most productive agricultural regions the agricultural activity generates a significant share of employment and rural economy. In others, especially more industrial areas, the agriculture represents a complementary element in the use of available production resources, mainly labour force and its main social benefits lies in maintaining natural resources and environment for settlement, recreation and production functions of the landscape.

The agriculture has the objective conditions to contribute towards overcoming the problem of unemployment in the country. It creates jobs uniformly dispersed in the territory, due to it ensures the maintenance of settlements in remote areas outside the urbanized centres. It can provide the employment to people who have reduced spatial mobility from the objective reasons (e.g. women taking care of the family).

Prosperity decline or decrease of agricultural activity have resulted in unfavourable consequences in the regional economy and rural areas. Saving the seemingly resources into agricultural support means increased requirements for transfers to the social sphere.

Employment fall in agriculture is mainly caused by a low production of the added value in the agriculture sector, which failed to start by the gradually increasing labour productivity (Table 4). The growth rate of labour productivity does not fully correspond to the employment lost in the sector, but under these conditions, in the period of a significant employment fall the productivity seriously increased (2010, 2011). This confirms, the main accelerator of stabilizing agricultural production is an increasing added value and is of a crucial importance for the stabilization of agricultural employment.

Table 4. Development of the social-economic indicators in the agricultural production

Indicator / Years	2008	2009	2010	2011	2012	2013	2014
Earnings in mil. €	54.7	-112.8	-13.9	73.6	35.0	-2.5	65.7
Gross agricultural production in mil. €	2,096	1,644	1,656	2,091	2,213	2,223	2,055
- plant	1,107	876	892	1,238	1,231	1,244	1,203
- animal	989	768	764	853	982	979	852
Employed in thousand	60.2	59.7	54.9	52.8	51.6	50.6	51.5
Average wage in agriculture in €/month	549	563	581	612	630	626	653
Number of employees per 100 ha of agricultural land*	3.12	2.83	2.70	2.52	2.41	2.42	2.50
Labour productivity in thousand € per employee*	36.7	29. 5	34.7	46.0	46.9	46.6	46.8

Source: Statistical Office SR, * Information sheets of MARD SR, NAFC-RIAFE.

Development in agricultural employment is characterized not only by the general significant decline in employment, but many workers with low human capital still remain working here as well (i.e. the less-skilled, older manual workers, etc.) and have even a low wage. Agricultural enterprises as employers pragmatically limit the qualification growth on the core of key employees and the workers with low or unsatisfactory qualifications are gradually pushed out into the unemployment registry.

In terms of the personal status in employment, in Slovakia a significant share in the total number of workers in agriculture and in food production have employees. The share of employees in agriculture tends to decrease and the proportion of entrepreneurs increases. Compared to the agriculture, share of employees in the food production is higher and has a fluctuating development tendency (Table 5).

Table 5. Structural development of labour forces in agriculture and food industry by employment status in %

	2008	2009	2010	2011	2012	2013	2014
Agriculture							
Employees	91.4	89.4	87.6	86.1	92.2	93.2	86.8
Entrepreneurs	8.1	10.1	11.8	13.5	7.6	6.4	12.1
Food production							
Employees	97.5	96.2	95.8	92.2	93.8	96.7	96.0
Entrepreneurs	2.7	3.8	4.2	7.6	5.6	2.8	4.2

Source: Statistical Office SR, calculations of NAFC-RIAFE.

Average age of workers in agriculture gradually increases, more rapidly among men. In the year 2014, the average age achieved 46.6 years that was by 0.6 year more compared to the year 2008 (Figure 3). Highest share – 38.5% of workers in agriculture is between 55-59 years old and share of young workers up to 30 years old reached 10.6%. Similarly to agriculture, the average age in food industry increases but workers in food processing were younger by 6.1 years compared to agriculture. Number of workers in food industry older than 50 years increased in the year 2014 by 4.2% compared to 2008 and it reached 24.5% on total number. Share of this category was 45.8% in agriculture while it enlarged by 11.9% during the same period. Concerning educational level, the highest representation has trained workers category in both sectors, then following category of workers with secondary education. Category of workers with basic education represents a smallest share. Majority of agricultural employees work in blue-collar professions of plant and animal production.

Figure 3. Age structure development of workers in agriculture in %
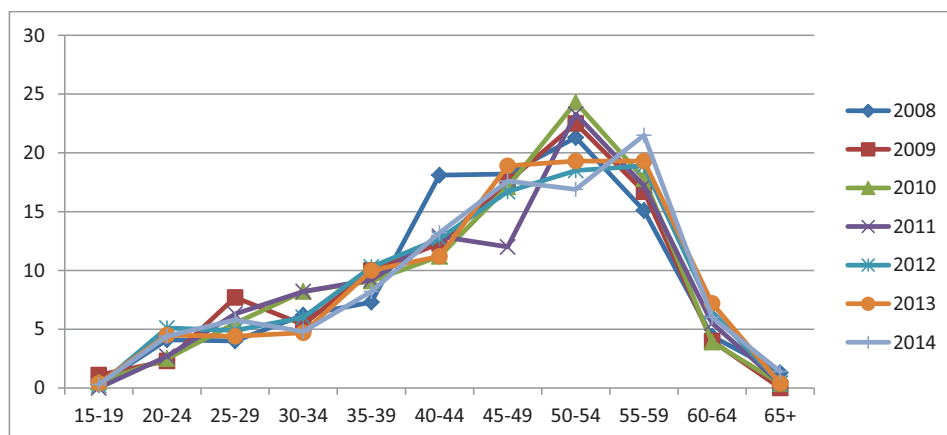
Source: Statistical Office SR.

9.4   Economic and social aspects of food industry

After the Slovak EU accession the employment in food industry was most influenced by changes related to full trade liberalization and retail chains pressure to their suppliers. Non-barrier entry on foreign markets opened new opportunities to our producers on the one hand, but on the other hand, it enabled to import uncontrolled food products of foreign provenance that may also be produced in Slovakia. The low competitiveness of Slovak products in the domestic and foreign markets results as a high value of a negative balance of foreign trade

in food products and as a share drop of Slovak products on market of the Slovak Republic. The issue is mainly the price of imported food products that often moves below the level of Slovak prices which caused departure of several food operators from Slovak market or their closures. Since 2008, the 15% of companies have disappeared while liquidation especially concerned of medium-sized and large enterprises. Remaining enterprises strive to succeed on domestic market, increase their competitiveness among other things by labour productivity increase and by cost efficiency reduction.

Within the framework of food industry most workers are employed by baking-confectionary industry (21.5 %), meat processing (16.1%) and dairy sectors (15.0%). The smallest number of workers are in a freezing (1.0%) and fat (0.7%) sectors (Figure 4).

Figure 4. Comparing the number of workers and average monthly wages in particular branches of food industry in 2014 (food industry=100 %)
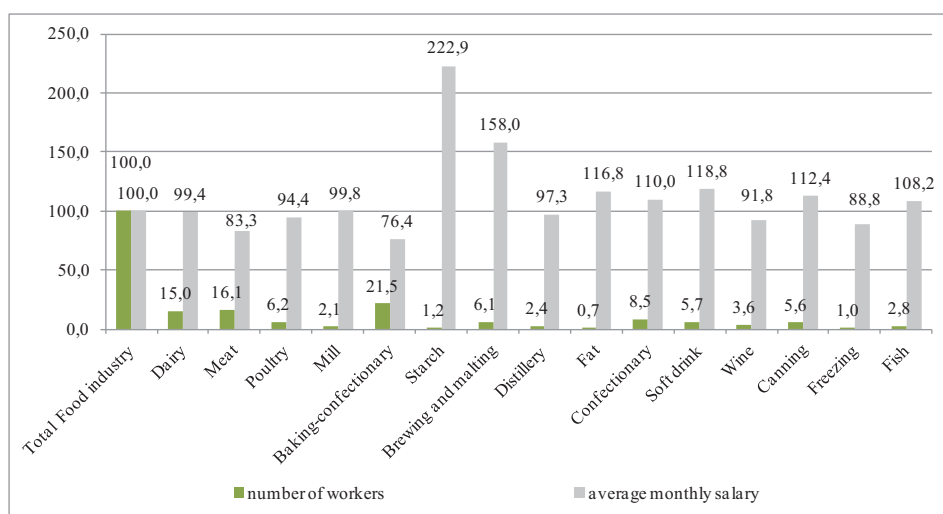
Source: statement Potrav (MARD SR), calculations of NAFC – RIAFE.

Significant part of established production preparation is consumed by material, energy and labour costs. Share of wages in total costs achieved 7.5% in 2014 that indicates apparently growing tendency (Figure 5). Total paid wages including compensation decreased just by 5.7%. Compared to the average wage of the total food industry, the wages paid in some sectors were highly above standard level in last year of monitored period, especially in the starch industry (122.9%), brewing and malting industry (58.0%), fat industry (16.8%), soft drinks industry (18.8 %), canning industry (12.4%) and confectionary industry (10.0%). These sectors are profitable in the long term. Average wage level of

food industry did not achieve in dairy, meat processing, poultry, milling, baking, distillery, freezing and wine industry.

Figure 5. The share of wages in total costs in the various sectors of the food industry in 2014 (%)
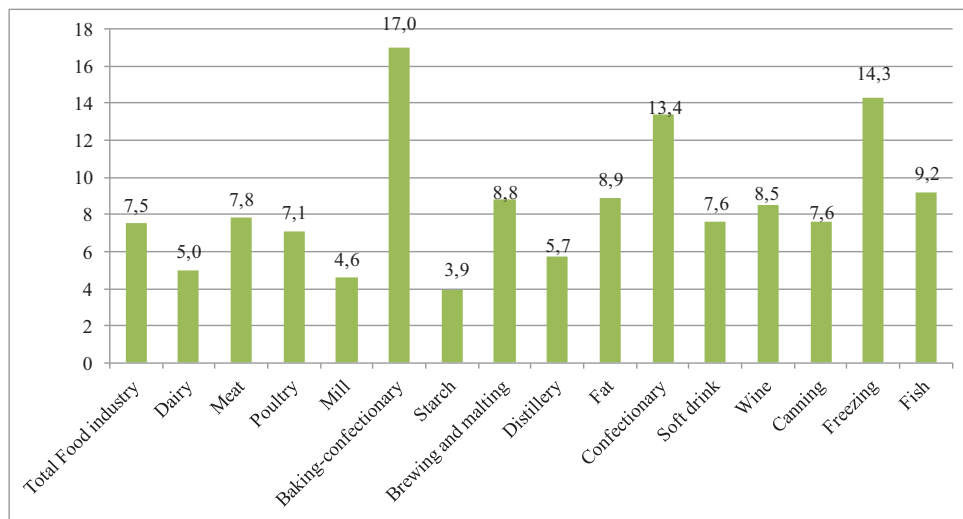
Source: Statement Potrav (MARD SR), calculations of NAFC – RIAFE.

Labour productivity measured by revenues from own outputs and services or revenues or production presents a size of the total economic benefit of the company per one employee. In the monitored period, the mentioned indicators grew by 5.2% along labour productivity from revenues, by 6.8% along labour productivity from production and by 5.9% along labour productivity from sales.

Among most important indicators of competitiveness in a company growth or in a sector belong the labour productivity from added value that grew by 19.6% within food industry during monitored period. In 2014, the highest value of labour productivity from added value achieved starch, brewing and malting industry. Mentioned industries were also most successful from labour costs profitability point of view. Above-average outcomes of labour productivity from the added value compared to other sectors achieved also soft drinks industry, canning industry, distillery industry, confectionary and wine industry (Figure 6, Table 6).

Figure 6. Labour productivity from added value in the particular sectors of food industry in the year 2014 (in thousand EUR)
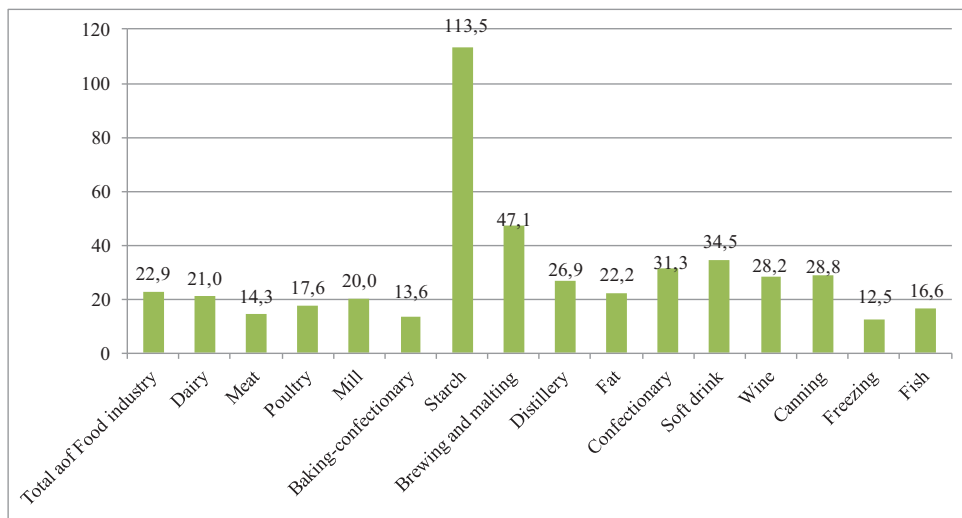
Source: statement Potrav (MARD SR), calculations of NAFC – RIAFE.

Table 6. Labour productivity and selected analytical indicators of food industry

Indicator	2008	2009	2010	2011	2012	2013	2014	2014/08 (%)
Labour productivity from revenues (th.€)	128.1	111.4	119.5	138.2	148.2	138.7	134.8	105.2
Labour productivity from production (th.€)	89.8	80.6	83.7	96.9	103.2	100.1	95.9	106.8
Labour productivity from sales (th.€)	88.4	79.6	82.4	94.0	100.8	97.4	93.7	105.9
Labour productivity from added value (th.€)	19.2	20.8	20.6	21.7	23.4	22.7	22.9	119.6
Labour productivity from total capital (th.€)	84.4	90.9	93.2	101.6	99.0	95.2	94.9	112.4
Share of added value on revenues (%)	15.0	18.6	17.2	15.7	15.8	16.4	17.0	+2.0
Share of revenues on total capital (%)	151.8	122.6	128.2	136.0	149.6	145.6	142.1	-9.8

Source: statement Potrav (MARD SR), calculations of NAFC – RIAFE.

The fastest way of labour productivity growth is a quantitative and qualitative increase of capital equipment, mainly an optimal use of machinery and available technological facilities. Labour productivity from the total capital grew by 12.4% in marginal years of monitored period. In 2014, it presented 94.9 thousand EUR of the total capital per one employee in food industry (Figure 4). Mentioned

value partially contributed to the sector performance growth and to the profit increase by 2.7 times compared to the year 2008. From the aspects of particular sectors, most capital per one employee was allocated in the starch, distillery and wine industry and least in the bakery and the confectionery industry.

Along with a machinery and technological equipment modernization a permanent employee education is necessary targeting to maintain working qualification with rapidly developed sophistication of these equipments. Vocational education should be more linked with food enterprises and in education of future employees more flexible respond to the technological development in the food industry.

One of the social situation indicators is also a food expenditures share. The food expenditures share of population (Table 7) on food, beverages and tobacco without public catering on total consumer expenditures achieved 28.9% in 2013, thereof share of expenditure on food and soft drinks was 25.7%.

Table 7. Share of foodstufs, beverages and tobacco in consumer expenditures (in %)

Share of foodstufs, beverages and tobacco in consumer expenditures	2009	2010	2011	2012	2013
Food products and beverages	24.23	24.80	24.39	24.87	25.65
Alcoholic drinks and tobacco	3.03	3.41	3.25	3.24	3.29
Food products, beverages, tobacco	27.26	28.21	27.64	28.11	28.94

Source: Statistical Office SR, calculations of NAFC – RIAFE, data of the year 2013 are simulated.

In Slovak households a rule proceeds: the lower income, the higher share of expenditure on food and more frequent substitution of expensive food products by cheaper ones. There are groups of population that have to spend on food more than 40% of their monthly budget. They buy less food products that support health protection (fruit, vegetable) and more energy richer foodstufs (fats, oils, white bread, sugar and similar products). Consumer´s expenditure structure of Slovak households has not changed markedly during last time. Highest expenditures are spend on foodstufs, beverages and tobacco where a growing tendency is registered. Second highest share composes expenditures on lodging; however, they have showed a declining tendency in last three years.

9.5   Conclusions

The predominantly rural regions (59%) inhabited by 50.4% rural population prevails in Slovakia. However, the production performance of the agriculture has decreased, it continues to stay one of the crucial elements within the rural economy, because it provides diversified job opportunities for members of rural households.

After the year 1990, the agricultural population has a decreased. Continuous tendency may direct towards possible complications of the labour forces reproductive basis for agriculture. Reason of employment decline in the Slovak conditions consists in a regression of the agricultural production connected with insufficient sales on domestic market, transformation, dissolution of the non-agricultural activities and consequently with low share of diversified activities, wage non-attractiveness and recently also economic and financial crisis.

Agricultural employment is significantly affected by rationalization measures of companies within material and technical base, cost savings, production efficiency, possibilities of production sale on domestic or foreign markets. Under the influence of rationalization and substitution of live labour by materialized labour, i.e. investments raising and thereby material and technical base of agricultural enterprises the paid manual labour is diminishing. Average age of workers in agriculture gradually increases and agricultural population is ageing. Wage development in agriculture is lagging behind the average wage in the national economy.

Economic situation in a food industry is substantially better than in the agriculture that is closely connected to the employment. The employment in the food industry of Slovakia is mostly affected by more stiff competitiveness of food products on the EU market what considerably contributes policy of multinational retail chains and lower patriotism of Slovak consumers. With the aim to succeed on a domestic and foreign markets, the processing companies try to raise their competitiveness among other things through the labour productivity increase and reduced costs resulted in reducing number of employees. Within the framework of food industry, the most workers are employed by baking-confectionary sector, meat processing and dairy sectors and the smallest number – freezing and fat industries. The average wage in the food industry is higher than in agriculture.

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10. The Russian food embargo: impact on the national agri-food sector

10.1 Introduction - Concept of Food Security Doctrine

The Russian Federation Food Security Doctrine and The State Program of Agricultural Development of Russia for 2013-2020 put forward the following priorities:

- In the production sphere – the development of import substitution agricultural branches, including vegetable and fruit farming, dairy and beef cattle, using the competitive national advantages, first and foremost substantial agricultural land areas;
- In the foreign trade sphere – increasing the export of agricultural goods and raw materials along with saturation with them of the domestic agricultural market.

So in some sense the food embargo met their goals and objectives as it additionally encouraged import-substitution in the agriculture and food industry of the Russian agri-food sector (AFS).

The tasks of the Russian food counter-sanctions (embargo) were:

- To "respond" the Western countries for imposition of politically motivated anti-Russian sanctions;
- To decrease the dependence on the imports of food, seed and breeding materials, in particular from non-CIS countries.

The embargo had been developing quite dynamically. In scale of coverage it expanded from 32 countries imposed the anti-Russian sanctions (EU28, USA, Canada, Australia, Norway – in August 2014 – August 2015) to 36 countries (plus Iceland, Albania, Montenegro and Lichtenstein joined Western sanctions – in August 2015-2016). From January 2016 г. embargo de facto covered 38 countries – it included Ukraine and Turkey, although for somewhat different reasons.

In scale of goods: by structure embargo covered beef and veal, pork, poultry meat and offal, fish, milk and milk products, number of vegetables, fruits and nuts. Some dairy products were added (June 2015). Some items were exempted – seed potatoes, salmon fry, vitamins (August 2014), meat and vegetable raw materials for baby food (May 2016). Initially the embargo covered 43% of the

EU agri-food export to Russia value as of 2013. The duration of the embargo successive stages increased from one year (till August 2015 and then till August 2016) to year and half (till December 2017).

10.2 External trade and investment ties, production and internal market of agri-food products

The embargo (together with the depreciation of the ruble) significantly influenced the Russian external trade and investment ties, production and internal market of agri-food products in 2014-2015. The "post-embargo" trends in the Russian agri-food foreign trade were rather positive (see Table 1).

Table 1. Dynamics of foreign agri-food trade of Russia
(food and raw materials for its production, $ bln)

Activity/year	2011	2013	2014	2015	2015 to 2013, %	2016 Forecast
Import of AFS commodities, of which:	42,5	43,1	39,7	26,5	61,5	24,0
- share of total commodities import, %	13,9	13,6	13,8	14,5	106,6	14,0-15,0
- EU28 share of AFS commodities import, %	29,1	34,7	25,4	19,2	55,0	…
Export of AFS commodities, of which:	13,3	16,2	18,9	16,2	100,0	18,0
- share of total commodities export, %	2,6	3,1	3,3	4,7	151,6	4,8 -5,0
- EU28 share of AFS commodities export, %.:	10,0	12,5	8,8	8,6	69,0	…
Coverage export import ratio, %, of which: - for EU28 ,%	31,3 10,6	37,6 13,5	47,6 16,4	61,1 27,5	162,5 203,7	75,0 …

Source: Calculated according the RF Federal Customs Service.

In 2015 value of AFS commodities import compared to "pre-sanctions" year 2013 dropped by 38% down to $26,5 bln. The volume of some agri-food imports fell even more (from 34% on butter to 52% on poultry meat). Mostly suffered the products 'under sanctions' (the import fell by 40%) and the respective countries (the imports from the EU fell by 66% to $5,1 bln, and its share in Russia's import of AFS products fell mostly twice, down to 19%). Accordingly reduced the financial burden of that import for the Russian economy.

In contrast the Russian export value of AFS goods stabilized on the level of 2013 $16,2 bln, with the growth of its share in the entire export by 1,6 times up to 4,7%. The share of Russia in the world export increased (wheat, barley, sunflower), expanded nomenclature of export (added corn, rice, soy, potatoes, meat). In 2015/2016 agricultural year Russia exported the record 34 mln t of grain and became the world's largest exporter of wheat (about 25 mln t) and a notable exporter of corn (nearly 5 mln t). The Russian meat export increased by 20% to nearly 0,1 mln t.

Although the agri-food import remains relatively high (14.5% of the total imports in 2015) the Russian agri-food trade became much more balanced. The coverage of agri-food import by export increased by 1.6 times – up to 61%, including that from the EU – by 2 times to nearly 28%. Such trends are likely to continue on in 2016-2017. According to some experts, export-import coverage will reach 75% in 2016.

The generally positive trends are observed in foreign investment in the Russian AFS. Attracting FDI in agriculture and food industry increased by 33% to $7.2 bln. Moreover, the excess of the FDI inflows over outflows has increased by 2.2 times up to $1.2 bln.

The geographical distribution of the Russian agro-food imports has changed dramatically in favor of "not-under-sanction" countries. In the first period of sanctions (09.2014-08.2015) compared with the period immediately before the sanctions (08.2013-07.2014) value of "under-sanctions goods" import decreased from $22 bln to $13 bln. Meanwhile the EU28 and Norway share in that import decreased from 31% to 3%, the USA, Canada and Australia share – from 7% to less than 1%. On the contrary, the share of Asia and Oceania increased from 15% to 23%, Brazil – from 9% to 16%, other Latin America countries – from 13% to 21%, non-EU European countries – from 2,5% to 7%. The share of the Eurasian economic union members (Belarus and Kazakhstan) increased from 13% to 20%.

The effect of counter-sanctions in production measurement was positive, though unevenly distributed.

Production specifics and import dependence on a number of the means production led to a stabilization (and acceleration for some branches) of relatively high rate of growth in the Russian AFS (of 3.0-3.5% per year for agriculture and 2.0 to 2.5% for food industries). However, agriculture became one of the drivers of the Russian economy. In 2013-2015 agriculture and food industry growth rates were ahead of GDP growth. In physical terms the production growth was more visible: for cattle and poultry for slaughter and vegetables – by 10%, poultry meat – by 18%, pork – by 28%, cheeses – by 25%. That rather

"inertial – point" nature of the growth was observed mainly in the industries invested before 2014.

The impact of that growth on the physical availability of food in Russia has been mixed. On one side, increase of domestic production not fully compensated for a sharp decline in some agri-food goods' import. For example, that compensation was about 80% for cheese, 70% – butter, nearly 20% for fruits. On the other side, the share of domestic products in basic food resources increased substantially and exceeded (excluding milk) the threshold set by the Food Security Doctrine for 2020 and for State Agricultural Development Program (excluding potatoes and milk) for 2015 (see Table 2).

Table 2. The share of national production in the Russian basic food resources,%

Production	Years							Food Security Doctrine thresholds
						2015		
	2010	2011	2012	2013	2014	State Agricultural Program	Fact	
Grains	99,4	99,3	98,8	98,4	98,9	99,6	99,2	95
Vegetable oil	76,6	78,0	83,6	81,4	85,0	83,8	83,9	80
Sugar (of sugar beet)	57,6	62,4	77,9	84,3	81,9	80,7	83,5	80
Potatoes	96,3	95,3	96,8	97,6	97,1	98,5	97,3	95
Milk and milk products (in milk)	79,7	79,9	78,9	76,5	77,0	81,9	81,2	90
Meat and meat products (in meat)	71,4	73,4	74,8	77,3	81,9	80,9	87,4	85

Source : Rosstat; The RF Ministry of Agriculture.

These results were connected with the dynamics of government support and the distribution of the effect of counter-sanctions. In 2 "embargo" years (2014-2015) agriculture received from the Federal budget more than $ 8 bln., only 50% less than in the previous 6 years. Though the difficult economic situa-

tion has led to a decline of the investment lending for AFS by 18%, short-term lending (mostly for seasonal agricultural activities) increased by 5%. Partial closure of the Russian agri-food market has significantly improved profitability of domestic producers. The profitability of agricultural enterprises (including subsidies) had practically tripled to 22.3%. In 2015, the share of profitable enterprises in agriculture amounted to 83,3%, in the food industries – 78,5%, with average in economy of 70,7%. However, state support and the effect of the rising domestic prices were distributed unevenly. The main beneficiary of the counter-sanctions was the big agri-food business. It got nearly 80% of the state support and increased dominance on the national market – the 10 biggest agri-holdings controlled about 5 mln hectares of farmland (equal to 40% of grain crops area in the Visegrad group), 8 food companies – 40% of the market of dairy products. According some experts, a new organizational model in the Russian AFS is under formation with the core of large vertically integrated agri-holdings with minimum 35 thousand hectares of land each. In the market of means of production for agriculture positions of the largest producers are even stronger. The mineral fertilizers market is controlled by 5 companies, agricultural machinery market – by even fewer producers.

In some sense embargo has contributed to the greater inclusion of the Russian AFS in the international cooperation. It stimulated the expansion of localization of foreign companies' production in Russia. The transformation of Russian subsidiaries of foreign TNCs into the organizational units of their added value chains (PepsiCo, Danone, McDonalds, Auchan) intensified. For example, McDonalds' Russian subsidiary already produced in Russia 80% of the necessary raw materials. Danone's subsidiary grew at 4-5% per year and in 2015 its turnover amounted to $1,6 bln. The formation of the world-class Russian agri-holdings began (e.g."Miratorg" in meat business with 750 thousand hectares of land and export 20% of production to rich Asian countries and the EU).

In contrast to the effect on the producers market, the effect of counter-sanctions on the consumers was generally negative – the economic accessibility of food has decreased. Partial closure of the Russian AFS market from the major foreign competitors and the depreciation of the ruble (which resulted in an increase in prices of imported means of production and a corresponding increase in costs in agriculture and food industries) contributed to the rapid growth of consumer food prices. From December 2013 to December 2015 these prices increased by 15%, from December 2014 to December 2015 – by 14%. From mid-2015 food prices began to decline markedly as a result of production growth while reducing production costs and of switching of consumers on cheaper alternatives.

Due to the stabilizing of production costs of agri-food producers, the growth of AFS food consumer prices slowed sharply to 3,1% in the first half of 2016 (see Charts 1 and 2).

Chart 1. Dynamics of consumer for goods and services

Динамика цен на потребительские товары и услуги

(в % к соответствующему периоду предыдущего года)
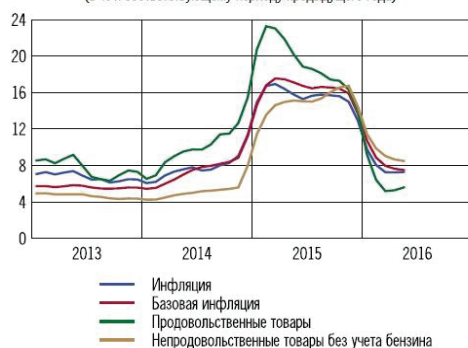
Источники: Росстат, расчеты Банка России.

blue line – inflation
green – food goods
brown – non-food goods

Chart 2. The increase in producer goods prices and consumer food prices

Прирост цен производителей и потребительских цен на продовольственные товары

(в % к соответствующему периоду предыдущего года)

Источник: Росстат.

blue line – food consumer prices
red – agricultural producer prices
green – food industries' producer prices

According to the RF Ministry of economic development forecast, in 2016--2019 the dynamics of food consumer prices will slow down considerably and decrease from 14% in 2015 to 6,2% in 2016 and 4% – in 2019. The downward dynamics of prices is associated with measures to stimulate growth in food production. From 2017, it is planned to reduce electricity tariffs for agriculture, to give agricultural producers preferential loans at 5%, to keep 30% subsidy of the purchase of Russian agricultural machinery. As a result in 2016-2017 is expected increase in production e.g. of meat by 920 thousand t, sugar – more than 700 thousand t, greenhouse vegetables – by 110 thousand t.

In general purchasing power of average per capita money incomes in 2015 as compared to 2013 decreased for the majority foods, in particular for "under--sanction products". Caloric intake remained stable, but the structure of food consumption changed in favor of cheaper products (poultry, milk, vegetable oil, potatoes, vegetables, bread and bakery products). In 2015 for the first time since the crisis year of 2009, the food reached 50% of retail trade turnover. Consumers noted the deterioration of quality of a number of foods. According to polls by the consumer markets research agency ROMIR, it was noted by 16% of respondents for vegetables, up to 33% for cheese. The proportion of counterfeit,

according to some estimates, is at least 25% for dairy products. There is some "naturalization" of food consumption. According to ROMIR, in 2015 for 37% of families, homemade food formed 33% of their grocery cart.

In general, the population is already adapted to the effects of the embargo. But for the needy the government is elaborating measures for the implementation of the adopted in 2014 the Concept of internal food aid. They may be implemented in 2017-2020 and according to some estimates could reach $6 bln and cover more than 10% of internal food consumption volume. At least 80% of this assistance should be provided with domestic food. This will create an additional incentive for national AFS producers.

As for the attitude of Russians to the Western sanctions and Russia's counter-sanctions, the majority of the population have adapted to the embargo and believe in successful import substitution, while some support the lifting the embargo. According to surveys by the reputable independent sociological institute "Levada-center" in May 2016, 75% respondents believed that Russia should continue its policy notwithstanding the Western sanctions, 74% – that Russia in the coming years would achieve import substitution for food and 47% thought, that Russia could lift the ban on food import from the EU.

10.3 Conclusions

- Food counter-sanctions have caused a noticeable (though not devastating) damage to the producers of food from countries that imposed anti-Russian sanctions, especially the EU (the trade loss for 2014 – 2015 of about $7 bln);
- They contributed to the restructuring of Russian foreign trade relations on agri-food products and to increasing domestic production. On a number of goods Russia has achieved (cereals, oilseeds) or is close to the access to (poultry, pork) leading positions in the global market;
- Given the increasing production of these products by 2020, it is possible to balance the value of agri-food exports and imports, and in the long term – to transform Russia into a net exporter;
- Meanwhile this effect is accompanied by decrease of economic access to food in the Russian market, therefore, requires the organization of internal food aid for the needy layers of the population;
- With the provision of such assistance and the stabilization of the ruble the Russian agro-food producers are in favour of maintaining the embargo until 2019-2020, under the condition of intensification of AFS state support, including the promotion of a competitive exports.

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11. Food security in Romania – determinants and vulnerabilities[22]

Abstract

The food security issue was a permanent concern of the Romanians in the last century, even though Romania is among the European countries with the largest agricultural land areas, thus having significant resources for food production. Despite this potential, Romania registered significant vulnerabilities in food security assurance for the population. These vulnerabilities emerge from the insufficient agricultural production level, from the domestic supply instability and price volatility, as well as from the deficient access to food of large population categories, under the background of income decrease and poverty in certain areas of the country. Based on plausible scenarios on the evolution of the general economic situation, as well as on the realistic forecast of Romania's agri-food sector evolution, Romania's Academy has developed a strategic vision of the food security and safety towards next 20 years aiming a better utilisation of the country's agri-food potential.

11.1 Introduction

Food security is the top priority of agricultural policies, both at European and national level. In the process of Common Agricultural Policy creation, completed in the early 1960s, food security, population supply with foodstuffs and agricultural supply stabilization at European level represented one of the core objectives; reaching this objective was supported by a mix of policies and interventions that fundamentally changed the European agriculture, which became one of the most productive in the world and a food security supplier worldwide. This process lasted almost 20 years and it was quite costly, as each year more than half of the EU budget was used for funding the Common Agricultural Poli-

cy (CAP). Yet the objectives were finally reached, and in the early 1980s the European Economic Community was self-sufficient in most food products, at the same time having significant surpluses. The CAP reform process began at that time, focusing on different other objectives, i.e. competitiveness, cohesion and sustainability.

It is necessary to reflect on this subject, as there is a significant development gap between Romania and the other countries of the European Union, and assuming the food security issue as a main objective of the national agricultural policy can represent a form of recognition of this gap. However, at the same time, the experience of the Common Agricultural Policy, which created the economic and financial framework by which, in a 20-year period, Europe turned from a net importer, dependent on the agricultural products from other continents, into an area with significant food surplus and supplier of food security at regional and world level, may represent an example to follow as regards the way to reach this desideratum. This would mean, in Romania's case, that besides the allocation of adequate financial and human resources, the agreed directions of action should be more consistently followed over a period of two decades.

The food security and safety thematic was approached while having in view the much too slow progress of the Romanian agri-food system, the delayed convergence with the performance indicators of the EU member states, the existence of poverty on large areas in the countryside and last but not least, the current vulnerabilities in reaching food security for the population. These vulnerabilities are generated by the insufficient agricultural production, by domestic supply instability and price volatility, as well as by the deficient access to food of large population categories, under the background of decreasing incomes and poverty in certain regions of the country.

A first objective of this paper consisted in the evaluation of the population food and nutrition security in Romania and the identification of its main determinants and vulnerabilities [Cocks et al., 2015].

The second objective targeted the development of a strategic vision of the food security and safety towards 2035, based on plausible scenarios on the evolution of the general economic situation, as well as on the realistic forecast of Romania's agri-food sector evolution [Vlad, 2015 and 2016].

11.2 Methodology

Food security can be evaluated at different levels, yet most references are made to the macro-economic (world, regional or national) level and to the micro-economic level, i.e. household and individual level. Depending on the reference level, the focus is laid on one or several dimensions of food security, name-

ly: food availability, supply stability, economic access and utilization, represented by the desire of people to have a healthy diet. In the case of using the food security concept at world or national level, the focus is mainly laid on the capacity of countries to obtain a sufficient agricultural supply in order to meet the population's food and nutritional needs.

Depending on the context, our analysis had in view both approaches to food security: the macro-economic level, when we investigated the capacity of the domestic agricultural production to meet the population's consumption needs for different categories of products and the micro-economic level, when we referred to the nutritional situation of certain less-favoured household categories (from the rural area or from certain socio-professional categories). The set of indicators used represents a combination between the indicators utilized by the national and international organizations for the evaluation of the population's food security and nutritional situation. The methodological and information sources are quite various and we can mention here the indicators and studies of FAO, OECD, IFPRI, Eurostat, EIU (Economist Intelligence Unit), Defra, Health Ministry from Romania and the National Institute of Statistics (NIS). In order to get a picture of the development and competitiveness level of Romania's agriculture within the European Union, we used for comparison the situation from France, a developed country, and Poland, a post-communist country under full integration process. The methods used by the team of researchers were from the category of qualitative methods (literature synthesis, SWOT, definition of scenarios and vision) and quantitative methods (extrapolation of trends).

The indicators are selected to mostly comprehensively reflect the level of domestic agricultural availabilities and supply stability, as well as aspects in relation to the physical and economic access to food, food utilization and elements related to the nutritional situation of the population and of the vulnerable demographic categories. The analysed data generally cover the period 1990-2012, for which information sources were available.

In order to present certain qualitative aspects of the population's food and nutrition situation in Romania, the Berry index was calculated, which measures food diversity, using the Romanian Household Budget Survey (HBS) micro data from the year 2011.

The Berry Index is constructed by adding the square of the share of expenditure for all food products) [Thiele and Weiss, 2003]:

$$BI = 1 - \sum_{i=1}^{n} \left(\frac{x_i}{X}\right)^2$$

where: x_i is the expenditure on the i product and X is the total food expenditure.

The BI can take values from 0 to 1, a value closer to 1 revealing a higher dietary diversity.

At the same time, by using the Household Budget Survey micro data, the vulnerable population categories were identified, by the amount of daily calories in diet and by the share of food consumption expenditures.

11.3 Determinants of food security in Romania

Food security is based on four pillars, namely: food availability, supply stability, population's access to food, food utilization and quality [Gross et al., 2000]. We shall next briefly present the main determinants that describe the food security level in Romania.

11.3.1. Domestic agricultural supply availability and stability

The food security issue was a permanent concern of the Romanians in the last century, even though Romania is among the European countries with the largest agricultural land areas, thus having significant resources for food production. Romania has significant agricultural areas among the EU-27 member states (14 612 thousand hectares), i.e. 8% of the arable area (5th position after France, Spain, Germany and Poland) and 8% of the area under permanent pastures (5th position after Great Britain, Spain, France and Germany). The agricultural land structure is favourable to the development of a diverse agriculture: in total agricultural land, arable land accounts for 64.3%, pastures and hayfields 32.9%, while the vineyards and orchards 2.8%. The arable land per person (0.44 ha/person) is higher than the values found in important agricultural countries from the European Union, such as France and Poland.

From the food security standpoint, agricultural production is the main reliable source for the food consumption availability assurance for the population of a country. With significant agricultural land resources, as well as with a population whose consumption needs became increasingly large and diversified in the last years with the growth of incomes and accession to the EU, at present Romania's agricultural production only partially covers the population's consumption needs. This because in the last 25 years, systematic deficits existed in certain important groups of foodstuffs, among which we can mention meat, milk, fruit, vegetables and fish and also cereals in the less favourable years as regards the weather conditions. The self-sufficiency level of domestic production was only 79% in fruit, 95% in vegetables, 82% in meat, 94% in dairy products and 17% in fish in the year 2013. The existing problems with regard to the domestic agricultural supply sufficiency are largely the effect of the lower per-

formance of the Romanian farming sector, generated by a complex set of factors, materialized into major gaps in the total factor productivity, in the productivity per employed person and in the average yields per hectare. One of the most important causes of this situation resides in the extremely fragmented agrarian structure and the extremely large number of small and very small-sized farms, which appeared as a result of the 1991 land reform. The consolidation process of small farms and the emergence of medium-sized farms is a process that takes time and needs adequate interventions, certain measures in this respect being also included in the rural development program 2014-2020, and the results are expected after many years or even decades. At the same time, the extremely fragmented agricultural supply obtained on these farms makes it difficult to organize the chains, mainly in milk, fruit and vegetables, and thus only a low share of these products makes its way from farm to consumer's table, being mainly used for subsistence consumption. Another worth mentioning aspect is the unbalanced structure of Romania's agricultural production, in the sense of the progressive diminution of the share of animal production in total agricultural production. This disequilibrium lies at the origin of gaps between the Romanian farms value added and incomes and the European ones, as the livestock production development makes it possible to better valorise the domestic production of cereals and other fodders. If we take into consideration the European Union average, in the year 2014, its production structure is well-balanced (54.5% crop production and 45.5% animal production) [Eurostat, 2015]. These values for Romania in the same year were 74.0% for crop production and 26% for animal production, while the same values for France were 59.9% for crop production and 49.1% for animal production. The assortment structure of Romania's agricultural production (2009-2013 average) is dominated by crops, among which we mention the cereals (14.9%), vegetables (17.8%), fodder crops (13.2%) and potatoes (5.7%), and less by higher value-added products, such as wines, fruit, floriculture or the animal products. This structure also influences the stability of agricultural production expressed in value terms, as it is well-known that crop production is much more unstable than the animal production, due to weather excess effects; implicitly, a higher share of crop production generates higher instability on the global agriculture production. At the same time, supply stability is one of the weaknesses of domestic agricultural supply. If we refer to the cereal production, for instance, the variation coefficient in Romania for the period 2004-2012 was 27.4%. By comparison, in France, the cereal production volatility was 5.8% and in Poland 8.9%, in the same period.

The deficits between consumption and domestic production are covered by imports, and the import dependency of domestic consumption is higher in

Romania's case compared to the countries of reference. Thus, in wheat for instance, the import dependency, calculated as ratio of imports to the domestic supply of cereals, was 9%-10% for France, 8% for Poland and between 13%--22% for Romania in the period 2008-2011.

Figure 1. Evolution of cereal production, import, export and consumption in Romania, in the period 1990-2012
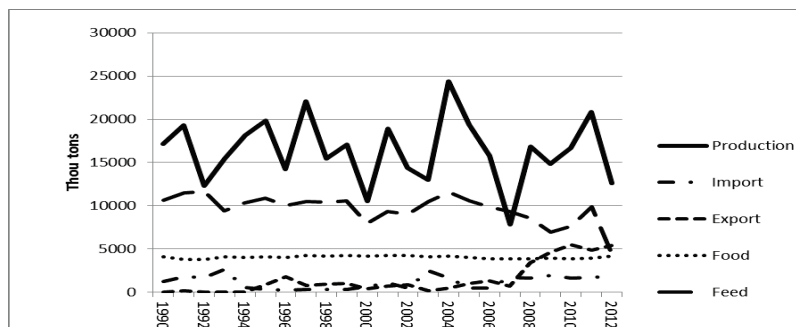
Source: FAO and Romanian Statistical Yearbook.

The chronic causes of domestic agricultural supply instability are the permanent and consistent decrease of effectively irrigated areas in the first place, under the background of the increasingly frequent extreme weather phenomena, mainly drought and excessive temperatures. The share of effectively irrigated areas in total agricultural land area was lower than 10% each year after 2007, to reach only 5.94% in the year 2013. The production technologies used and the extremely low use of agricultural inputs as technical progress carriers represent the second factor generating agricultural production instability in Romania. There is a differentiation between the large and very large-sized farms, which practice an advanced European agriculture on almost half of the country's cultivated area, with good results and high average yields, on one hand, and the small and very small-sized farms, with a traditional, subsistence farming practice, with very poor results and low yields, on the other hand. On the average, in Romania, the fertilizer application rate per hectare is one of the lowest in the EU (30 kg/ha nitrogen compared to 76 kg/ha nitrogen, in France, 2013), and this is one of the main causes of the extremely low average yields per hectare in this country.

At the same time, there is an extremely low interest of public authorities in research & development in agriculture in Romania, as in the period 2007--2010, the total agricultural research expenditures decreased from 552.1 mil. RON to 170.7 mil. RON, while from the public funds from 249.4 mil. RON to 96.8 million RON [Steriu and Otiman, 2013]. At the same time, farmers' access to banking loans is quite low, which constrains the possibility of funding certain

production infrastructure segments (local irrigation solutions, for instance) or the utilization of certain production technologies that could attenuate the extreme weather effects.

Among the strengths that can be noticed with regard to agricultural and food supply availability, one can mention the development of the food and beverages industry sector in the last years; this sector became the second in size in Central and Eastern Europe, after that from Poland, and significant investments were made in the sector in the last decade. Many investments in the processing sector were made with EU funds, under the programs SAPARD and NRDP (2007-2013). Thus, 833 investment projects in the food industry were approved under NRDP, with a total value of about 1700 million euro, out of which from public funds 621 million euro, but only 75% were paid by May 2015. In the period 2007-2013, farmers spent about 527 million euro by funding certain investment projects under NRDP, in order to build up and improve the cereal storage facilities, which determined the increase of the cereal storage capacity by 2.5 million tons, to reach 17.3 million tons at the end of the period.

At the same time, the food retail sector has significantly developed in recent years, with one of the highest growth rates in the region. This can be explained by the fact that the change of the lifestyle following the economic growth and accession to the European Union resulted in the increase of consumers' openness to the modern food retail forms. Significant improvements were also made in food safety, with the accession to the EU. Phyto-sanitary and zoo--veterinary norms in conformity with the European legislation were also implemented both in the agricultural production sector and in agro-processing. The adoption of these norms became compulsory with Romania's EU membership, although certain transitory periods and derogations existed, limited in time and to certain units, which produced only for the domestic market. At the same time, food supply diversity also increased, mainly for the processed foodstuffs, as well as in the fruit/vegetables segment, which was reflected in the increase of the population's consumption diversity. The dietary diversity in Romania, as measured by the Berry index, increased from 0.87 in the year 2004 to 0.90 in 2011 [Alexandri and Pauna, 2015].

11.3.2. Economic access to food
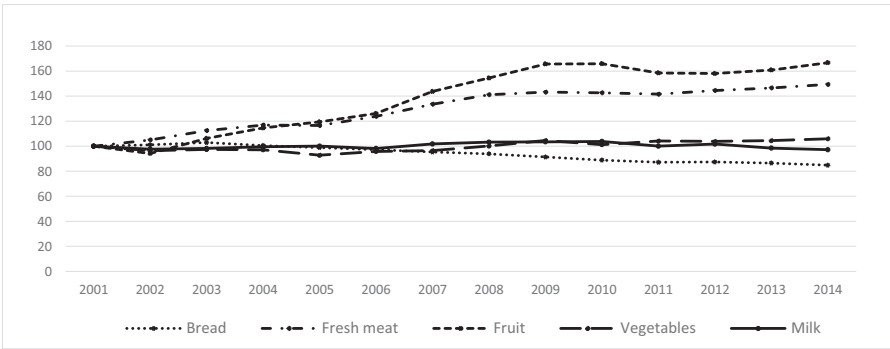
The population's access to food improved in the last decade, under the background of the growth of main income sources (wages and pensions) and of the population's purchasing power implicitly. The real incomes significantly increased in the economic growth period, so that in the year 2008, compared to 1990, the real wage index was 130% and the real pension index 112%. Starting

with the year 2009, real incomes began to decrease, yet they resumed their growth in the year 2013 [NIS, 2014].

At the same time, the relative food prices, according to the purchasing power parity, are lower in Romania compared to the EU average, yet they have increased much faster in recent years, reaching higher levels than in Poland in the year 2012. In the year 2012, compared to the average level of EU-27 of 100%, the food prices accounted for 67% in Romania, 60% in Poland and 110% in France. By groups of products, the situation of relative prices in Romania was the following: 63% for cereal products, 57% for meat, 68% for fish and 93% for dairy products. The effect of incomes and prices on consumption was manifested by consumption increase in those foodstuffs considered as superior food, mainly meat, fruit, dairy products and fish. Thus, according to the data supplied by the Household Budget Survey, in the year 2009 (when incomes reached a maximum level) compared to the year 2001, meat consumption per capita increased by 45%, fruit consumption by 58% while fish consumption by 78% (Figure 2). At the same time, the food consumption in the products considered inferior in nutritional terms decreased in the same period, namely in potatoes, roots and even bread. It is worth mentioning that the animal protein intake increased to 60.4 grams/day (2008), from 43.7 grams/day in 2001 [NIS, 2015].

Figure 2. Food consumption evolution in the economic growth period 2001-2014 (2001=100%)

Source: Household Budget Survey, 2001-2014, NIS

At the same time, as a weakness, in the context of the population's access to food, we cannot ignore that the population's average incomes are very low in Romania, and GDP per capita expressed in purchasing power parity terms is quite low in Romania, below the EU average, on the penultimate place after Bulgaria. Thus, in the year 2014, the average income in EU-28 was 27325 PPS,

in Romania 14674 PPS, in Poland 18638 PPS, while in France 28923 PPS. Yet, beyond the average values, there are large population income gaps by regions, reflected by GDP per capita expressed in PPS, and these gaps grew larger in the post-accession period.

Thus, in the year 2012, compared to the European level of 100%, GDP per capita was 122% in the region Bucharest-Ilfov, while in the poorest region of the country, North-East, GDP per capita reached only 29%. In the year 2014, in the same regions, the values were 72% for the region Bucharest – Ilfov and 23% for the region North-East.

Yet the key factor, which reflects population's vulnerability in Romania with regard to food security, is represented by the share of food consumption expenditures in total consumption expenditures [Alexandri, 2013]. This has very high values in our country, practically indicating that half of the consumption expenditures of households (44.9%, in 2013) are food expenditures. This indicator has even higher values in the case of the poor population (first decile of incomes), reaching 65% of the consumption expenditures in the year 2013; yet this percentage slightly decreased in the last decade (compared to 79% in 2001 and 68% in 2007). In the other European countries this share is much lower, i.e. 12.2% in France and 18.9% in Poland. Although probably there are also certain differences as regards the calculation methodology, and we refer here to the evaluation of self-consumption in the first place, from any perspective, in Romania these values are excessively high and reveal the vulnerability of the low-income population's access to food, of the population from the poor areas of the country or from certain less-favoured categories.
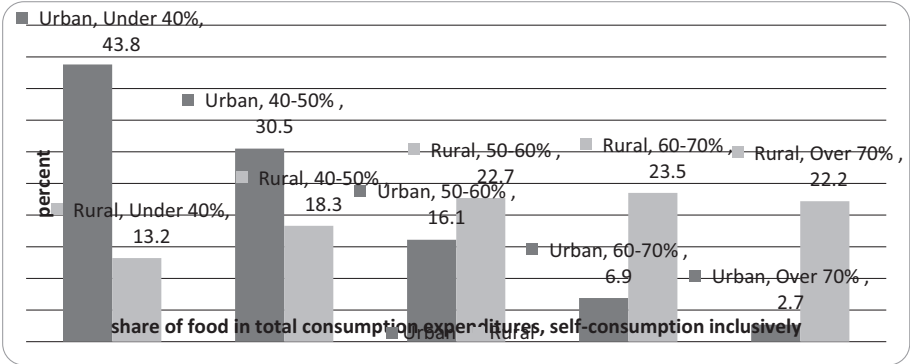
Figure 3. Distribution of households by the food consumption expressed in calories in the 1st quarter of the year 2011, by residence areas
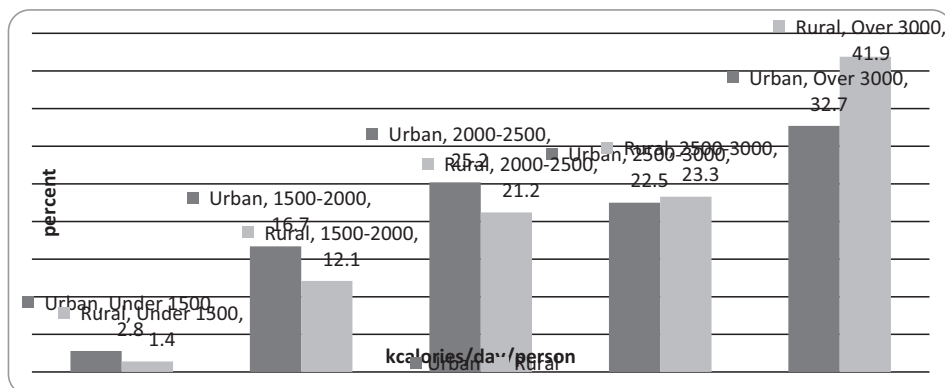
Source: processing of micro data from the Household Budget Survey, NIS.

Yet behind the average values, there are significant gaps between households by residence areas. Although food consumption in the rural area is quite similar to that in the urban area in terms of energy intake (Figure 3), in terms of food expenditures, the rural households are in a difficult situation (Figure 4), with about three quarters of households allocating more than half of their consumption expenditures on food.

Figure 4. Distribution of households by the share of food expenditures in total consumption expenditures in the 1ˢᵗ quarter of the year 2011, by residence areas

Source: processing of micro data from the Household Budget Survey, NIS.

The HBS data also make it possible to approximate the vulnerability level of a certain segment of the population, i.e. the roma households, in which the food energy intake is under the minimum requirements defined by FAO (about 2000 kcal/day/person) for almost half of the enumerated cases (Figure 5). At the same time, more than half of the roma households spend more than 60% of total consumption expenditures on food, and a great part even more than 70% (Figure 6).

Figure 5. Distribution of households by food consumption expressed in calories in the 1ˢᵗ quarter of the year 2011, for certain population segments

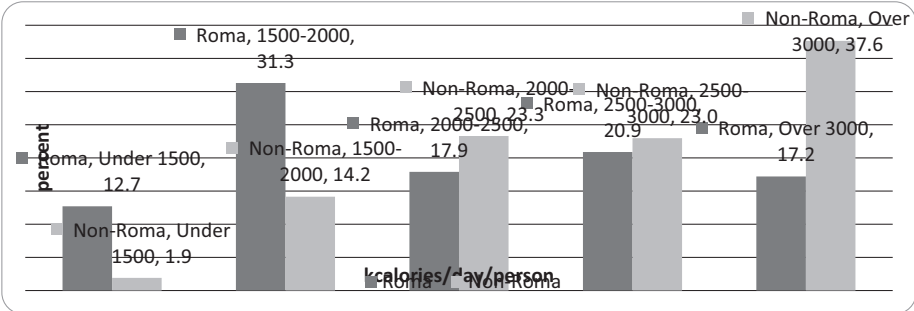*Source: processing of micro data from the Household Budget Survey, NIS.*

**Figure 6. Distribution of households by the share of food expenditures
in total consumption expenditures in the 1st quarter of the year 2011,
for certain population segments**
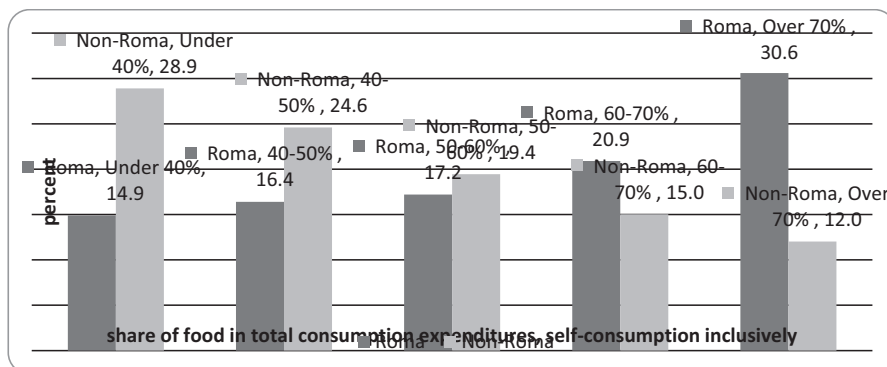
Source: processing of micro data from the Household Budget Survey, NIS.

At the same time, the databases that contain the food security indicators for certain countries point to certain problems in the population's physical access to food in our country, if we consider the road network density in 100 km^2, which is lower in Romania compared to the reference countries, and followed a decreasing trend in the last years [EIU, 2014]. Thus, for the year 2011, the road network density was 191.6 km/km^2 in France, 131.8 km/km^2 in Poland and 46.8 km/km^2 in Romania.

11.3.3. Food quality and safety

In Romania, the utilization of food is characterized by poor food consumption in terms of quality consisting of:

- high share of calories from cereals and potatoes;
- low intake of animal protein.

These characteristics generate nutritional risks for the vulnerable categories (under the poverty threshold and social exclusion), namely: low income groups, rural population, roma population.

At the same time, an important food quality indicator is represented by dietary diversity. Food consumption diversity is important from several points of view. In the first place, a most diversified diet is a modality to protect ourselves against certain diseases. In this respect, the nutritionists' opinion is that an optimum diet should contain the highest possible number of food products. At the same time, the increase of food consumption diversity in certain geographic areas has important implications upon the world and regional agri-food trade and upon the economic development in general.

In order to measure food diversity, the Berry index was used, applied to the micro-data from the Household Budget Survey in the year 2011 (first quarter of the year).

The results reveal that the households with high dietary diversity account for 68% of the urban households and only 36% of the rural households. The rural households have a moderate dietary diversity, most of them (47%) being in the interval (0.80, 0.90) for the Berry Index (Figure 7). The higher dietary diversity in the case of urban households in comparison with rural households represents an indirect effect of income disparities between the households from the urban and rural areas.

Thus, in 2011, according to the Household Budget Survey, urban households had total and cash incomes higher by 23%, and respectively by 73% compared to rural households. In addition to the income factor, other factors that influence consumer behaviour and dietary diversity could be considered, including some demographic factors like educational level of household head, children number, and household size. In addition, the access to food retail systems and to transport infrastructure may also influence the behaviour of consumers from different residence areas.

Figure 7. Distribution (%) of urban and rural households by Berry Index, in the first quarter of 2011
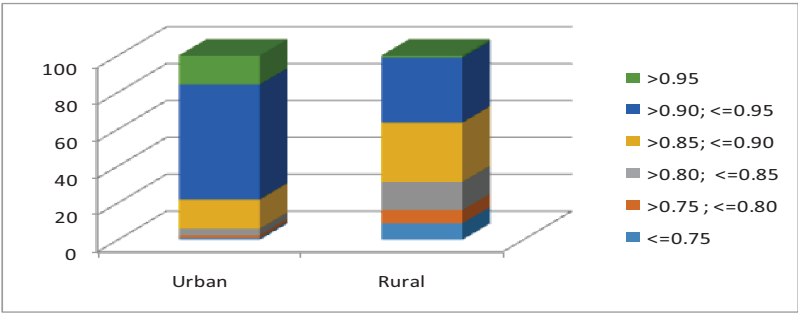
Source: authors calculations based on Household Budget Survey, NIS database.

Another category of problems affecting the population's food quality and safety in our country results from the lack of sanitary infrastructure and drinking water supply network in many localities, most often in the rural areas. Thus, the share of the population with access to improved drinking water sources is below the EU standards, where the population has full access to improved drinking water sources, except for several countries (among which Romania). However, in Romania, this percentage increased from 75% to 83% of the population in the period 1990-2009, according to FAO database. In the two reference countries this percentage is 100%.

At the same time, the share of the population with access to sanitary facilities also increased in the period 1990-2008 from 71% to 72% according to FAO data. In France and Poland this percentage reached 100%.

11.4 Strategic priorities for food security and safety within Romania's development strategy for the next 20 years

In Romania, food security has been a permanent concern for the population, due to the permanent threats existing throughout time, resulting from the insufficient quantitative and qualitative domestic food supply on one hand, and from the deterioration of the level of incomes and purchasing power on the other hand, which directly limit the population's economic access to food. Food insecurity is a direct consequence of poverty.

The analysis of the food security situation in Romania highlighted several vulnerabilities:

- Instability of domestic agricultural production, insufficient level of meeting the consumption needs from domestic resources in important products, such as meat, fruits, vegetables, sugar and fish, in which the systematic deficits are covered by imports;
- The integration of the Romanian agricultural markets on the European Single Market is under way, yet a series of products are in difficulty due to the pressure of prices from the adjacent regional markets;
- Poverty incidence increase amplifies food insecurity in the less-favoured social categories;
- The deficient food consumption in qualitative terms, the high share of calories from cereals and potatoes, as well as the low animal protein intake have resulted in nutritional risks.

The strategic vision on Romania's population food security, for the next 20 years, has three strategic priorities [Vlad, 2015], namely:

- Increasing Romania's agriculture role as food security supplier, through:
  – increased coverage of food consumption needs from the domestic agricultural production,
  – domestic agricultural supply stabilization, mainly through support measures for the irrigation and land reclamation infrastructure, as well as through other measures to fight against the climate change effects,
  – increasing the agricultural exports and acquiring the food security supplier status at regional and European level;
- Increasing the population's economic access to food and nutrition quality improvement, through:
  – increasing the population's purchasing power,

- bridging up the gaps referring to the food access of the different categories of households,
- qualitative improvement of the population's food diet by increasing the animal protein consumption and food diversity;

- Rural development and raising the educational level – premises for food safety and nutrition improvement by solving up the technical and transport infrastructure by the year 2035 and by raising the young farmers' educational and vocational training level.

The agricultural production self-sufficiency, defined as the share of domestic consumption covered by domestic production is considered, by the traditional approaches, as the main guarantor of a country's food security. Starting from this consideration, the proposed strategy has as main direction the increase of agriculture role as food security supplier at national level.

Out of this reason, mainly those products were investigated where deficits exist with regard to their current self-sufficiency: meat (pork, poultry, and beef), vegetables and fruit [Vlad, 2016]. For these categories of products, most plausible hypotheses were formulated on the future evolution of productions, of structural modifications at sector level, of the support measures and possible investments on medium and long term; short, medium and long-term targets were formulated, while also having in view the future conjuncture of foreign markets.

The domestic agricultural supply stability will be reached, on the first place, by the rehabilitation and modernization of land reclamation systems. In the case of the irrigation systems, the focus will be laid on the rehabilitation of economically viable and marginally viable land areas and increasing the share of the effectively irrigated land areas in total area equipped with irrigation facilities, and even overlapping the respective areas, in order to revitalize agricultural production and increase its productivity and stability. The second direction targets the development of the demand-driven agricultural knowledge and information system, focusing on farmers' needs and based on the close and functional relationship between extension, research and education.

As regards the population's access to food, we started from the hypothesis of stronger economic growth in the period 2016-2025 and moderate growth in the period 2026-2035 [Vlad, 2016]. In these conditions, we expect the increase of the population's food purchasing power and the decrease of the share of food consumption expenditures from its current percentage of 37.4% to about 29% towards 2035. At the same time, we expect the modification and diversification of diet by the increase of meat, vegetables and fruit consumption and decrease of cereal consumption.

The technical and transport infrastructure as well as the rural population's educational level impact the development possibilities, the rural population's welfare and food security. In this context, targets were formulated that should lead to a functional integration of the rural space into the national territory by supporting the efficient interconnection of transport networks, development of drinking water supply and sewerage systems as support to business environment development and improvement of life quality in the rural areas. The improvement of the young people's educational level and vocational training in the rural area is also important, in order to increase their access and participation on the labour market, so that they can get satisfactory incomes and have access to a nutritionally balanced diet.

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12. Economic Assessment of Neonicotinoids' Use Restriction on Sunflower and Maize Farms in Bulgaria and their Reaction

Abstract

By the Regulation 485/2013 the European Commission has suspended from 1.12.2013 to 2016 the use of three active substances of the class of neonocotinoid pesticides for the seeds treatment, excluding for the seeds of autumn cereals. This regulation aims to protect the endangered population of bees in all Europe. According some researches (in Romania for example), the implementation of the Regulation is related to several negative impacts on the economic state of farmers. The article aim is to present the results of the analysis of economic losses for agricultural producers of sunflower and maize and their reaction as a result of the acting prohibition for neonicotinoid pesticides' use. Similar research has been realized in Romania, which shows that the Regulation implementation has negative results on farmers' economic state (Ionel, Y., L. Luca, Ruse M., 2015).

12.1 Introduction

The main methodological approach of the research is a non-exhaustive survey of producers of sunflower and/or maize, combined with basic elements for the economic theory of the gross margin. The total respondents' number amounts 173 persons from 20 country regions. Their distribution per regions is irregular. The predominant parts of interviewed farmers function on the territory of the biggest cereal-producing regions in Bulgaria (Pleven, Dobrich, Rousse, Silistra, Burgas and Vratsa). This gives reason to consider that received results give relatively precise picture of the damages on the crops and of suffered financial losses, due to the appearance of soil pests.

The total size of used agricultural area of farms is 2601121 decars, which is 5,23% of all UAA of the country in 2015. The range of areas with sunflower in 2015 is 6,5% of all the area, planted with sunflower in the country. The relative share of areas with maize in the sample is 8,3%, i.e. almost 10% of all the country area, planted with maize.

12.2 Methodological tools for economic assessment of losses from the restricted use of neonicotinoid pesticides

The used methodological instrumentation in the research of Romanian scientists (Ionel, Y., L. Luca, Ruse M., 2015) is based totally on the opinion of farmers – respondents for the size of suffered economic losses. Even realistic, such approach contains some elements of subjectivism, when the questions affect financial indicators. For this reason, apart from the information from the survey, we have implemented supplementary more objective criteria, measuring the economic losses of farmers. They are related to the use of officially published statistical information for agricultural crops' prices and for the production costs, per types and sub-types (4,5).

As a consequence of the applied methodological approach, the analysis of economic losses is led in two aspects. The first aspect reflects the amount of missed incomes, due to collapsed areas, because of non-use of neonicotinoid pesticides. The purpose is to make assessment of missed profits, due to the presence of soil pests causing areas collapse. As a result, these farms could not receive the planned incomes and bear potential losses.

The elaboration of the economic assessment of missed incomes within the first direction is based on the theory for the gross margin. It is one of the most used ways for analysis of a particular farm's economic state (1,7,8,9). The gross margin reflects the relation between the prices, the production and the costs. This indicator is obtained as a difference between the gross production and the variable costs. The maximization of the gross margin and the profit are interconnected (or costs' minimization), because the fixed costs do not change. For this approach have been used the following indicators:

- Value of variable costs (BGN/decars) for the sunflower and maize growing. They include costs for fertilization, main soil cultivation, pre-sowing soil cultivation, seeds, disinfection of seeds, sowing, rolling and treatment with herbicides, insecticides and fungicides. The values of variable costs have been defined on the base of elaborated technological maps from the Agro-Market Information System, on national level and per statistic regions. This way, the different impact of soil-climatic and other factors on the amount of production costs for the sunflower and for the grain maize has been eliminated.
- Purchase price of sunflower and maize (BGN/t). The source of information is National Statistic Institute. The collected information from the survey is used as a supplement, as the answer of the question: "Did you have collapsed areas in result of pests' attacks and if yes, which was their size?"

The second aspect of the economic assessment is related to the additional costs, which producers of sunflower and maize have been forced to invest for the reseeding, for alternative methods against the soil pests and for the increased sowing norm. For the assessment of additional costs have been used the answers of the following two questions: "Which alternative methods and additional costs did you have in the period 2013-2015?" and „Which financial losses has the farm suffered from the restriction of neonicotinoids' use?".

We should notice that in both methodological approaches the received subsidies are not taken in consideration. Their impact is eliminated, because the research target is to assess the impact of collapsed areas on the farm's economic state. The principle of elimination of some factors is one of the main principles of the analysis of a definite factor's impact on some resultant indicator.

Different statistic methods have been used, of which: method of statistical groupings, method of comparative assessment, variation method, method of average-weighted value, graphical method etc.

12.3 Assessment of missed incomes due to collapsed areas for 2013 and 2015

Obtained results related to changes of the level of missed gross margin or the so-called incomes in 2013 and 2015 could be seen in Table 1.

Table 1. Change of the level of missed incomes on a farm, from collapsed areas with sunflower and maize in 2015, compared to 2013

Region	Sunflower		Variation coefficient 2015/ 2013 (times)	Maize		Variation coefficient 2015/2013 (times)
	2013	2015		2013	2015	
Pleven	2901	14036	4,8	x	17790	x
Russe	27823	49233	1,8	30523	41850	1,4
Varna	24794	17150	0,7	x	6491	x
Dobrich	32545	25718	0,8	16770	18821	1,1
Burgas	359	1791	5,0	x	219	x
Vratsa	x	x	x	11332	14595	1,3
Average for 1 farm	15058	20122	1,3	17889	25088	1,4

Source: Information from National Statistic Institute, empiric research and own calculations.

Analysis of obtained results shows that the pace of change of missed incomes in 2015 versus 2013 for both crops is the same. The total amount of the missed incomes on average for 1 farm has increased 1,3 times for the sunflower and 1,4 times for the maize. The missed incomes level in 2015 from collapsed areas with maize is higher than the same with sunflower. The reasons are the higher variable costs for 1 decar of sunflower in comparison to these for the maize.

From a territorial aspect, the highest increase pace of missed incomes from collapsed areas is observed in the regions of Burgas and Pleven – respectively 5 and 4,8 times. Despite the considerable increase of missed incomes in Burgas region, we should notice that in this area they have the lowest values in 2015 also. Independently of the little change of the missed gross margin amount in the most developed productive regions of sunflower, their absolute level remains very high in 2015 too. In the regions of Russe and Dobrich agricultural producers have the highest missed incomes in both 2013 and 2015, as their amount reaches respectively 49233 BGN in Russe and 25718 BGN in Dobrich. It is obvious that in one of the biggest productive regions, as the region of Russe, the losses caused by collapsed areas are almost three times higher than the average missed incomes for the country.

The received results for the missed incomes from collapsed areas with maize are similar to the sunflower's ones. Firstly, in this case also the farmers from Russe and Dobrich regions have suffered the biggest losses from missed incomes; their amounts are respectively 42000 BGN and 18821 BGN. This is completely explicable, having in view the compactness and the proximity of maize and sunflower crops in farms. Secondly, we could notice the big degree of variation between the different regions, regarding the missed incomes, due to collapsed areas. This conclusion is valid for the areas with both crops, for the maize the variation coefficient (V) reaches 93,4% and is slightly bigger than the sunflower coefficient (V = 81,2%).

The increase of amount of missed incomes in 2015 against 2013 could be definitely explained by the higher share of treated areas in the first year in relation to the period after the introduction of the restrictive measure for neonicotinoid pesticides use. The average range for the country of treated areas with sunflower in 2013 amounts 56,1% and drops sharply to 19,9% in 2015 and for the maize decreases from 51,7% to 11,9%. There is an inverse correlation of the level of losses from missed incomes and the size of treated areas by neonocotinoids. In territories with big percentage of treated areas the gross margin is lower or it does not exist because of lack of collapsed lands. Some farms from the regions of Lovech, Pleven, Veliko Tarnovo, Silistra could be such examples. And the opposite, where the treated areas occupy insignificant share of the total

arable farms land, there are bigger missed profits. These are farms from the regions of Dobrich, Russe, Varna (lack of treated crops). In the regions of Pleven and Burgas the share of treated areas, according data from the survey, is respectively 87,8% and 76,7% , which overcome the average share for the country, amounting 50,5%, while in regions of Russe and Dobrich the share of treated areas is respectively 2,9% and 21,3%.

The following more general conclusions could be made from the analysis of change of the level of missed gross margin from collapsed lands:

- An inverse correlation between the levels of gross margin in farms has been established; the share of treated by neonicotinoids areas, compared to the total area, cultivated by sunflower or maize. This is valid for both analyzed years. As bigger is the size of treated areas, as fewer are losses from collapsed areas;
- Regions with biggest losses suffered by the farmers, assessed through the gross margin from collapsed areas with sunflower are Russe and Dobrich. The region of Russe is the most damaged, in which farmers suffered losses over the average for the country for both crops;
- Regions with lower level of missed incomes, in relation to the average for the country are Pleven and Burgas for the sunflower and from collapsed areas with maize – Pleven, Varna, Dobrich and Burgas.

12.4 Assessment of additional costs, due to collapsed lands from soil pests attacks

This part of the analysis is dedicated to the calculated additional costs from farmers, which include mainly the costs for granulates, foliar treatments, for seeds treatment (decontamination) etc. To these costs some farmers have added the costs for the necessity of reseeding, due to collapsed areas or rarefied crops. The received results are shown on Figure 1.

Figure 1. Additional costs, used for alternative methods against soil pests, per regions (BGN)
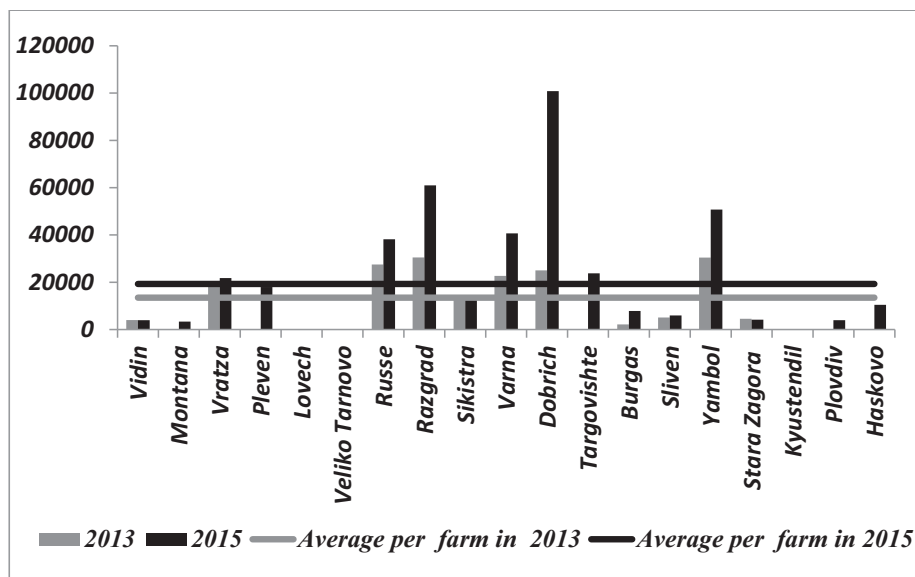
Analysis of last data shows the increase of additional costs, average per 1 farm in the period 2013-2015. This increase on average for the all sample in 2015 is 1,43 times, comparing to 2013. The highest increase of additional costs is in Dobrich and Burgas, respectively 4 and 3,6 times. This result corresponds to the bigger size of collapsed lands in mentioned regions, thence to the necessity of more costs for reseeding or searching of alternative tools for the fight against pests. We should notice that the list of regions where farmers have implemented some alternative approach in 2015 has increased. If in 2013 11 of 22 regions from the sample did not use such approach, in the next two years their number, their number has been reduced to 6.

The figure does not include the regions of Pernik, Blagoevgrad and Sofia, because in the three years in these regions no one farm has indicated that it has made additional costs. The least additional costs were incurred by farmers in regions of Vidin, Montana, Stara Zagora and Plovdiv. For the mentioned locations the threshold of additional costs is about 4000 BGN. In the following three regions – Silistra, Stara Zagora and Vidin – the questioned farmers have invested less additional funds in 2015, compared to 2013. The conclusion is that despite the total increase of additional funds, related to collapsed areas and rarefied crops, there is a big variety and inequality between additional costs' amount in different regions. This conclusion could be confirmed by the evaluated values of

the variation coefficient, which are almost the same for the three consecutive years, approximately 122-124%. The established trend of increase of the additional costs' amount is due mainly to farmers from Dobrich, Razgrad and Varna regions.

12.5 Reactive behavior of farmers in the fight against the pests in conditions of banned nicotinoid pesticides use

Important challenge for the pest control, especially within the complete or partial prohibition for neonocotinoid pesticides use, is the implementation of alternative methods. This is related to the use of other chemicals, different from the prohibited or even transition to biologic means for pests' control. The analysis of results for the active behavior of farmers regarding the implementation of these tools has direct connection with the realization of the mentioned necessity. There is collected and processed information from answers of the following question: "Which alternative methods have you used in the period 2013-2015 for the sunflower and maize growing?" on Figure 2.

Figure 2. Farms number used different alternative methods for pest control in the period 2013-2015
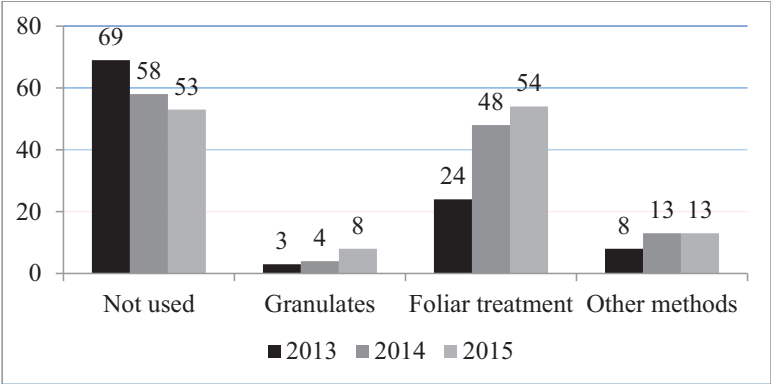
Source: Information from empiric research and own calculations.

In the analysis of data on the figure above we discover the optimistic trend of increase of the number of farmers, implementing alternative methods for pest control. This is valid for the foliar treatment and granulates, as the increase for both methods is more than twice. The most probable reason for the observed growth is the imposed restriction for neonocotinoid pesticides. Respectively, the number of their users diminishes from 69 in 2013 to 53 in 2015, i.e. by 20%. The use of the so-called other alternative methods in 2014 and 2015 also has increased

by 62%, compared to 2013. In the group of other alternative methods are included: seeds treatment, used by 9 farmers; 15 farmers have indicated the reseeding of areas and 5 respondents have indicated that is necessary to higher the seeding norm. For the foliar treatment implementation the most used pesticides are Nurele A and Nurele Dursban, Proteus, Cypermetrin, Actara 25 BG. For seeds treatment farmers have indicated the application of pesticides Kreitzer.

From the conducted analysis of reactive behavior of sunflower and maize producers we could generalize that Bulgarian farmers use other pesticides, different from neonocotinoid ones, but having chemical composition. The implementation of biological methods for pest control is still unpopular. Recently, a report from "Greenpeace" outlines several effective opportunities to fight against soil pests without pesticides. They include accompanying plants; carnivorous plants – hosts; pheromones and use of kaolin clay as a protective barrier on the leaves. This way could be prevented the insects' bites on the leaves. The application of reliable non-chemical preparations should be a priority in the farmers' agricultural activity.

On Figure 3 is presented the change of farmers' activity degree toward the application of alternative methods for pest control in the period 2013-2015, per regions.

Figure 3. Number of farmers, which have used alternative methods for pest control, per regions
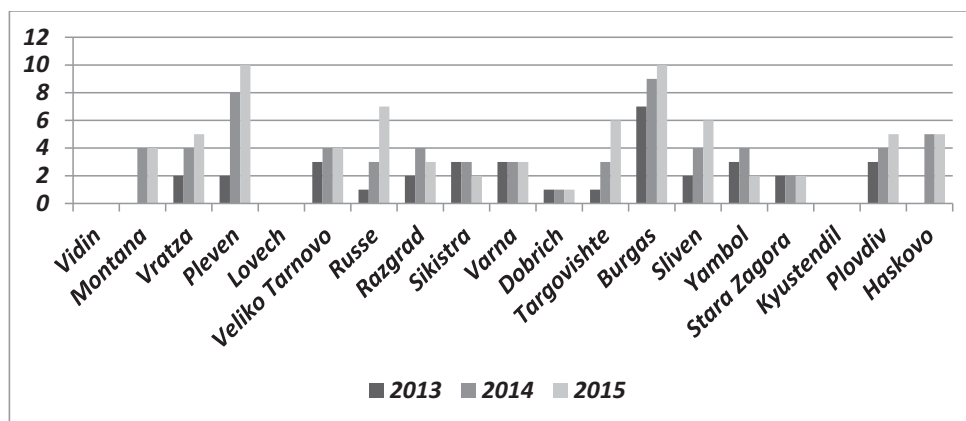
Source: Information from empiric research and own calculations.

The analysis of last data shows unambiguously the observed in almost all regions trend of farmers' activity increase concerning the implementation of other methods for pest control. The indicated trend is stronger in the regions of Russe, Pleven and Targovishte, where the activity growth in 2015 against

2013 is 7 times and 5 times, following by the regions of Sliven (3 times) and Vratza (2,5 times). Apart this, despite the weaker increase pace of farmers willing to apply different methods for pest control in Burgas region (1,4 times), the higher activity level show the regions of Burgas and Pleven.

In the regions of Montana and Haskovo in 2013 the activity level toward alternative methods is on 0 level, in the next years part of farmers have been oriented to their implementation. The conclusion we should make is that as a result of the introduced restriction for neonicotinoid pesticides use and the followed negative results on the production and on the economic activity, the farmers have started their orientation to implement different methods for pest control. The regions of Varna and Stara Zagora keep a constant level of alternative methods use.

There are also regions where agricultural producers did not undertake such steps for pest control. In all years of the analyzed period the level of activity remains 0. These regions are Vidin, Kyustendil and Lovech.

From the conducted analysis we could generalize that independently of the general trend of farmers number increase, which search alternative methods for cope with soil pests, there are big differences between the regions. This is proven by the values of the variation coefficient on Table 2.

Table 2. Values of variation coefficient (V) between the different regions, in relation to different alternative methods use

Types of alternative methods	2013	2014	2015
Granulates	3.18	2.54	2.42
Foliar treatment	0.78	0.93	0.92
Other methods	3.29	1.69	1.47
Not used	1.23	1.38	1.37

Source: Information from empiric research and own calculations.

The obtained results show the increasing number of producers using the foliar treatment, which determines the lower variation coefficient (under 1). For the rest two varieties of alternative methods: granulates and other methods, predominantly reseeding, the variation value diminishes over time, which is also indicative for the recognized necessity of their implementation from more and more farmers. Or they could be forced by the occurred circumstances to apply and experiment different kinds of methods.

Answers of the question above are given by the answers to the following question from the questionnaire: "If you did not use alternative methods for pest control, which are the reasons?". The answera could be seen on Figure 4.

Figure 4. Causes defining the non-using of alternative methods for pest control
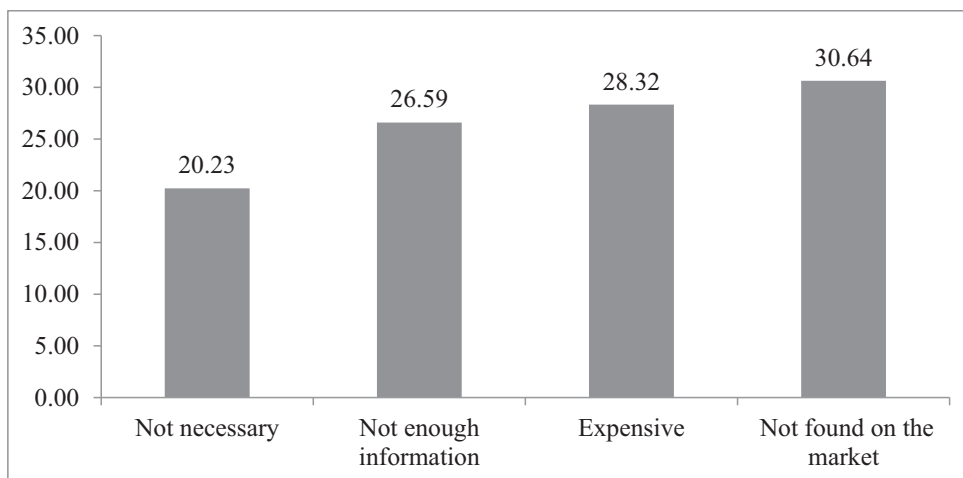
Source: Information from empiric research and own calculations.

The Figure above shows distinctly the demotivating factors for the decision making to use alternative methods. The reasons of market character have leading place, despite the small differences between the mentioned reasons. They are connected to the insufficient availability of alternative products on the market and to the high market price for approximately 30% of interviewed farmers. The lack of enough information for the opportunities of alternative methods also determines the relatively low degree of their application. This factor mention 26,6% of respondents. It is obvious that a wide information campaign is necessary about the opportunities for use of alternative, including biological instruments in the fight against the pests of agricultural crops.

12.6 Conclusions

Obtained results and generalizations from the conducted research give reason for the following conclusions. In 2015 agricultural producers of sunflower and maize have suffered serious economic losses after the respect of the imposed prohibition for neonicotinoids' use. Damages are expressed firstly in missed incomes due to collapsed areas. Secondly, losses are supplementary costs, related to the necessity of reseeding, to the implementation of alternative methods against the soil pests and the raised sowing norm. As a result of the complete or the partial ban for the use of neonicotinoid pesticides, the farmers have reacted by an increased interest in the implementation of different alternative means, especially other chemicals for pest control. Regarding the opportunities of non-chemical (biological) methods, they are insufficiently known and still unattractive for Bulgarian farmers.

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13. New Challenges for social and Development Policy – an attempt at a summary

Recently, the complexity of the global economy has been exceptional. This makes analysis of its condition and causative factors quite a challenge because it results in the necessity to select aspects of its development and functioning. The discourse shows how reality is divided into categories, most frequently valuating it using opposing categories, e.g. wealth and poverty, development and underdevelopment, democracy and authoritarianism. This is manifested by ideas, concepts and actions of individuals and decision-makers at the company, state and international institution level. The entities involved include also interest groups and the entire society. Such difficulties result from conflicting recommendation regarding the direction of global development, development priorities and interaction between the economic growth objectives and social goals.

An equally important issue is the question on how to study development phenomena and processes in the global economy, which involves selection of adequate analytical methods. Measurement of social and economic achievements is one of the most important and most difficult issues both in economic theory and practice. It is particularly difficult to measure socio-economic development. Socio-economic development includes economic growth, improvement in the quality of social life, and changes to the natural environment. The common measure of economic processes post-World War II, i.e. the gross domestic product (GDP), is increasingly more often criticised as the global economy grows more and more complex. There are many rightful reservations related thereto (Stiglitz, Sen, Fitoussi 2013; Kołodko 2008, Philipsen 2015). The GDP dynamic is an inadequate measure from the perspective of objectives assessed in contemporary societies. GDP indices promote quantity – the more an economy produces, the better; quality is taken into account to a lesser extent, though. The allocation and origin of the final product are irrelevant. Drugs and other stimulants, spending on the military and pornography, etc., are treated the same as spending on healthcare, education, and culture. The national income is increased by spending on medicines, babysitter or even prostitution. In the GDP approach, healthcare, child care and help for relatives or satisfaction of sexual needs in a relationship have no value. GDP also does not take account of the condition of

the natural environment. The distribution of the product is also irrelevant to GDP – it may be the entire society that benefits from the increase in the national income or just the richest 1% of the society.

The disadvantages of the quantitative measuring of the social and economic achievements, based on GDP, show the necessity to increase the role and deepen qualitative analyses, particularly of phenomena that cannot be directly assessed in terms of monetary value.

Relatively the simplest task is to analyse structural changes. In the post--war period, the social and vocational structure of European societies evolved systematically. The proportion of people employed in industry and agriculture gradually decreased, while the percentage of people employed in services grew. Nowadays, 70-75% of all the employees work in the services sector. This means that the majority of workers are currently employed in small and medium enterprises with diverse business profiles and vocational requirements. This significantly changes the relations and the balance of powers in societies. The drop in the numbers and the political importance of the employees of large industrial companies makes social solutions that extend to entire industries or sectors less reasonable, and requires more "horizontal" ways of achieving social goals. This also means a decrease in the political importance of trade unions.

The social role of women and family models are also changing. The economic emancipation of women has far-reaching effects for the welfare instruments that have been used to date, and which have been generally adjusted to the traditional family model with a single breadwinner and a woman who was primarily a wife and a mother (Golinowska 2002). On the one hand, it increases the total workforce supply and, on the other – the need for new types of social services, such as child care in families where both parents work and solutions that make it possible to reconcile motherhood with women's economic activity. This is also the result of the trend that means decrease in the role of the traditional multigenerational family and increase in the number of single mothers.

The acceleration of social and economic processes is related to the increase in globalisation. Globalisation means growing interdependency of states and individual citizens. Europe can no longer develop in isolation from the outside world. Goods, services and capital markets are more and more integrated due to new technologies and increasing openness of individual economies and enterprises to international trade. Subsequent rounds of the WTO negotiations resulted in significant reductions in tariff and non-tariff barriers to trade in goods and services. Due to direct investment, foreign multinational companies establish networks of international trade and production connections across state borders. The development of information technology and capital account liberalisa-

tion resulted in the emergence of the global financial market. New challenges, such as environmental protection, struggle against climate change or provision of energy, require international cooperation and measures that exceed capabilities of individual states.

One of the main effects of globalisation is the increase in international competition. The influx of capital and technology to poorer countries – where the labour cost is lower or conditions for business activity are better – makes it possible to develop production at lower costs. The producers in those countries have easier access to markets of developed countries due to open borders and liberalisation of trade. More intense competition from new industrial countries primarily affects the labour-intensive sectors of processing industry, which use common and typical technologies easy to import and imitate. Initially, these were such sectors as production of clothes, footwear, toys and electronics and metallurgy. However, new industrial countries are becoming major competitors in industries using more advanced technology, such as shipbuilding, automotive, electronics and computer industry. Chinese and Indian companies, and to an increasing extent companies from Vietnam, Indonesia and Brazil, produce and sell standard products at competitive prices, mainly due to lower labour costs and lower social and environmental standards, often also due to lower taxes.

European companies in the traditional industries often stand no chance in the face of competition from these countries. High labour costs, fiscal burden, and extensive worker privileges make the production of standard and labour-intensive goods unprofitable in Europe. Therefore, there are three options for European companies. They may reduce labour costs by reducing employment and wages, but this strategy has slim chances of success in the long run because it is difficult to compete with Chinese or Vietnamese wages. They may transfer production to countries where the production costs are lower – such "offshoring" is an everyday practice in companies that produce clothes, simple electronic devices, and also in the automotive industry and many services. Finally, they can stop the previous production and move to more technologically advanced sectors. In each case, it is necessary to bear the additional costs related to adjustment, but only the third option results in a long-term possibility to protect jobs and increase income at the country level. But it requires understanding of the inevitable nature of the ongoing changes, specific adjustments, particularly with regard to improvement of professional qualifications and the education level, and the abandonment of the illusory hope that the *status quo* can be protected.

Another megatrend that has brought and is still bringing social and economic changes to the modern world is the acceleration of technological change in the 1990s, primarily due to the development of information technology and

telecommunications. The application of computers and development of software multiplied the capability to process data, collect and use information, test new solutions, design technologies, and to organise and control production processes. It is estimated that computerisation allowed the USA to permanently increase the potential economic growth rate by 1–1.5% of GDP over the last 15 years. In Europe, the computerisation and increase in the use of IT is slower than in the USA, thus its effect is less significant. The impact of the development of tele-communications, particularly mobile phone networks, satellite connections, and the Internet, is similar. Both kinds of technological information – computerisa-tion and telecommunications development – not only allowed new, dynamic economic sectors (the IT sector) to emerge, but also contributed to the increase in labour efficiency in all segments of the economy.

Just like in the case of globalisation, faster technological change means growing pressure from the competition. As globalisation in most cases confirms that producers in less developed countries may produce specific products cheaper than producers in more developed parts of the world, the technological change results primarily in the development of new, better quality products, application of new, faster and more efficient processes, and a leap in labour efficiency. Be-cause of the present technological change specific industries, products and jobs sooner become obsolete and new professions emerge as required by new types of production. The change to supply and demand structure is also faster. Rapid structural change leads to the necessity of adjustments in the form of change to production processes, learning and acquisition of new qualifications. The job a person learned in their youth is no longer enough for their entire life and does not guarantee that they will find a job in the rapidly changing world.

This results in new requirements for employees, entrepreneurs, and public authorities. In the context of the rapid technological change, the existing job pro-tection policy prevents the opportunity to adjust to the modern market, impairs competitiveness, and slows down economic growth. According to many, the employment protection policy instruments, which were developed in the 1950s and 1960s, must be fundamentally reformed. There is a need for new instruments that allow workforce to be more mobile in terms of sector, job profile and region. There is also a need for an in-depth revision of the employee mentality that would ensure understanding of the irrevocable nature of the ongoing changes and the recognition of the necessity for lifelong learning to maintain employability.

A new phenomenon is the increase in the public debt in the largest econ-omies worldwide. The public debt bomb has never been so large compared to the global GDP. In 2015, the debt in the OECD countries exceeded 120% of GDP. In developing countries, the debt has recently lowered to about 35% of

GDP. Increasing financial needs lead to the growing debt service costs and costs of credit, which limits crediting. Public debt impacts global production and trade, and it also affects the scope, objectives and the capability to finance essential social needs.

The free market capitalism in developing postmodern society is different from its historical predecessors, primarily due to its global nature and the fact that it is to a large extent focused on the cash flows network, pushing aside the interests of the public for the benefit of narrow groups of politicians and various lobbies.

All the forecasts by renowned institutions and figures share their message: the domination by the Occident is coming to an end. On the one hand, it is said that the Western civilisation, particularly Europe, is losing its position due to the extensive welfare system and, on the other, some argue that the increasing income inequality does not only hamper development but also poses a threat to economic, social and political stability.

Since the end of World War II, the dominant view of most governments and multilateral organisations treated economic development and growth as synonyms in the context of free market international economy. Economic growth was understood as a necessary factor for the struggle against poverty, which is defined by reference to the inability to satisfy one's basic material needs in the context of financial transactions. It was assumed that free market system makes unlimited economic growth possible. The economy attains a growth level at which the people at the lowest living standard levels also have their share in wealth. This view reinforced the belief that the development will bring profit to everyone.

An alternative view arose from relatively rare reflections by certain governments, UN agencies, local movements, non-governmental organisations and certain academics. They focused on the issue of equal rights and distribution. In this approach, poverty is the inability to satisfy one's own and one's family needs both in the context of monetary transactions and also the lack of an environment that facilitates human well-being, which is defined by spiritual and communal values.

As the Cold War ended and the Eastern Bloc collapsed in 1989, the neoliberal economic and political philosophy dominated the global perception of development. The defence of the liberal economy values played a leading role in the acceleration of globalisation, which also brought a significant ideological change. The earlier institutionalised liberalism was replaced by the neoclassical economic policies in their purest form. They favoured the night-watchman state and increased significance of the market, and they manifested themselves as the Washington Consensus. According to the prevailing opinion, global welfare can

be increased by way of liberalising trade, finance, and investments, and by restructuring national economy to turn it into a good environment for investments. In addition, implementation of such policies was to enable and ensure repayment of debts.

From the liberal perspective, the countries most integrated with the global economy experienced higher growth due to liberalisation of trade.

Critics of the traditional approach to the issue of development deny the statistically calculated economic growth and GDP *per capita* as measures of the situation of entire societies or its individual social groups. Therefore, the supporters of the alternative approach pay attention to the income distribution pattern in the entire global community and within individual countries. They argue that economic liberalism, which maintains globalisation, contributes to the increasing differences between countries and even greater disparities within them.

They claim that economic growth contributes to decrease in poverty only if it is accompanied by specific social and economic policies aiming at combating it. In 1987, the UNICEF published a report entitled *Adjustment with a Human Face* (Comia et al. 1987). The analysis included the description of the social cost related to the implementation of structural adjustment policies (SAPs) and recommendations to reformulate it in order to take account of that cost. In the 1990s, the UNDP developed the Human Development Index (HDI) which made it possible to study development in respective countries. By making such factors as life expectancy, literacy or the average local purchasing power, the new instrument produces totally different findings and different view of development than the traditional tools based on GDP *per capita* (Thomas et al. 1994, p. 22). For example, China, Sri Lanka, Poland or Cuba rank higher if evaluated using HDI than in rankings based on the traditional measures, while Kuwait and Saudi Arabia rank definitely lower. In the 1990s, the Human Development Index was made more precise, and in some countries the data obtained due to its application was broken down according to race, sex, ethnicity, and region. The Human Poverty Index (HPI) illustrated the distribution of effects of development with regard to measures used by HDI, while the Gender Empowerment Measure (GEM) aims at monitoring the relative position of women. However, assessment with those measures is not easy. As shown by the *UNDP Human Development Report 1996*, categorisation according to sex is not useful, e.g., in the case of India, where women's opportunities to a large extent depend on the region, ethnicity or the fact whether an individual lives in a city or in the country. The application of HDI instruments by certain UN agencies and use of other tools by World Bank and the International Monetary Fund show their totally different approach to the

issue of development. It also demonstrates the complicated and diverse nature of situation in specific regions.

One of the greatest contemporary challenges is social inequality. Most economists accepted huge income inequality as a fact due to their conviction that a socialist therapy is worse than the capitalist disease, and the loss due to inefficiency of socialism would greatly exceed potential benefit of greater equality. However, income inequality has dramatically grown not only in Europe and America but also in new powers: China, India, Russia, and the regions where inequality has been traditionally significant, such as Africa. In the last decade, Latin America was the only exception to that rule, primarily due to the rapid rise of the middle class in Brazil.

Inequality grew for several decades, but it became visible only after the financial collapse. Before banks collapsed nearly all around the world, a loan was easy to get, and purchases on credit gave an illusion to millions of people that they are richer than they actually were. Democratisation of everyday life standards concealed the factual differences.

According to the 2005 Oxfam report data, the one per cent of the richest will soon own more than the remaining portion of the global population.[23] What is more, assets of the wealthiest grew by USD 600 billion in 2010-2014, while the assets of the poorest shrank by USD 750 billion. At the same time, the global population increased by 400 million. [http://dw.com/pl/1HIS/]. The authors believe that governments of individual countries should find a way to flatten the income pyramid to help the poor (and to some extent also the middle class) and simultaneously limit the richest elite's income. The question how to do it remains open. "Even if the rich were moved by their consciences, and they distributed their assets among the poor following the example of Saint Francis, there would be only USD 500 *per capita*". [Lubowski 2014]

In theory, differences in income provide the rich with an opportunity to save and invest money, and thus they are a stimulus for efficient work and should be good for growth. However, excessive differences – of course, we should ask how to define excessive differences – for some are a barrier to education and for others give rise to resentment and bitterness. Thus, a quite simple theory causes practical manoeuvres whose results are uncertain. There is also a question whether significant differences are beneficial or rather harmful.

Social stratification gives rise to the risk of political or energy terrorism, mass economic and political migration, and the related health and epidemic risks. Inclusiveness is a value by itself. But treating equality as a value by itself

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[23] Oxfam – an international organisation that includes 18 NGOs organisations from 90 countries.

leads to the question whether it is unimportant what happens with funds resulting from the reduction in over-average income.

The inclusive system releases creativity and initiative by reinforcing positive ties based on the sense of security, trust, and common interests. Nowadays, in the postmodern era, "[...] instead of an economic system based on the realities of the society, we deal with relations based on the economic system, and the society becomes an addition to the market."

Alain Touraine describes the increasingly clear discrepancy between the economic system, and the cultural and political life as the end of the social world.

These theses are also proved by an attempt to explain the global financial crisis of 2008. Krzysztof Opolski argues that this crisis was not merely an economic or consumer crisis but primarily a crisis of moral values and standards, identities, and social ties.

Critical views formulated by various non-governmental organisations, local organisation, UN agencies and private entities and foundations may be seen as an alternative approach that recognise economic growth as a sufficient factor for the improvement to lives of all the members of society.

This alternative approach to the issue assumes that the process should:
1. be directed towards the needs (both material and immaterial needs);
2. be endogenous (formulated within a particular society);
3. be independent (with regard to human, natural and cultural resources);
4. take account of environmental issues;
5. be based on structural transformations (in the field of economy, society, sex, power relations).

A response to these views is the European social model (ESM), which is being implemented in the European Union and aims at:
− full employment and protection against the risk on the job market,
− provision of income to persons unable to work,
− reduction in poverty and income inequality,
− access to social services.

There are four types of instruments that address the aims: job market policy, welfare policy, income and tax policy, and social services provision policy.

The listed ESM aims are commonly accepted in European societies, which does not change the fact that the application of traditional instruments in new conditions is often ineffective, inefficient and sometimes even harmful for the economy. This in turn gives reasons for increasingly numerous claims that tools and principles of the ESM should be reformed. Conclusions from the studies show that in most of the EU countries both Public Sector Efficiency and Public Sector Performance are generally low; there are also many cases where funds

are wasted, Secondly, the findings show that a big public sector slows down economic development. In the countries where the public sector has exceeded the optimum size and it hampers development potential of the economy, reduction in and better allocation of public spending may contribute to the increase in the economic growth rate. Thirdly, reduction in public spending above certain level in developing countries is very costly, and it only slightly contributes to the improvement in the society's life.

The weaknesses of ESM policy are found at all levels, from the job market to the provision for old age. The primary disadvantages of European job markets include: low economic activity of the population and the tendency to leave job market early, excessive tax and transaction burden of labour costs, including high tax wedge, relatively high minimum wage in most countries, which restricts employment, particularly in the case of less qualified workers, young people, and women, absence of income support instruments for the lowest paid employees, low average work intensity in terms of hours worked by a single employee in a year, and overly restrictive labour law, which focuses on protecting existing jobs and restricts necessary workforce mobility. Comparison of situation in the individual EU Member States shows that performance and efficiency of labour markets in Scandinavian and Anglo-Saxon countries is better than in the Continental Europe, the Mediterranean, and the new EU Members States.

An important component of the ESM, which determines economic society for the constantly growing group of pensioners is the intergenerational retirement pension system. In such systems, the pensions are still paid, but they are financed from the contributions to a decreasing extent and from the debt to an increasingly greater degree. The greater portion of this debt exceeds the GDP of individual states multiple times, which leads to a reasonable suspicion that this debt will never be paid. In the recent dozen or so years, the inequality has become so big that the situation can only be managed by comprehensive reforms.

One of the most important social policy areas, in terms of the public interest and the public funds as well as the effect on the economy due to the fact that it affects workforce supply and quality, is health protection. The demand for healthcare services and spending on them will systematically increase both due to unfavourable demographic trends and the change of lifestyle in European societies. In such conditions, it is more and more difficult to maintain the traditional healthcare systems.

According to those opinions, reforms should cover all four basic ESM areas. As far as job market policy is concerned, there is a proposal to depart from the traditional ways to protect existing jobs in favour of workforce flows between sectors and regions and enhancement of workers' capability to attain new qualifications

and take new types of jobs. Education and vocational training are main instruments that can be applied to the rapidly changing conditions on the job market.

At the welfare level, there is a proposal to replace solutions that encourage employees to leave the job market and retire earlier with stimulation of economic activity in all social groups.

In the field of public good provision, there is a preference for solutions that would ensure universal availability of many public services (education, healthcare) and make it possible to use their positive non-market effects while rationalising the demand for them and the cost of their provision.

In the field of tax policy, there is a proposal to remove the unnecessary tasks of the tax system and focus on fiscal and economic goals and to achieve social goals, such as income redistribution or help for the poorer social groups by way of appropriate level and structure of budget spending.

According to many politicians, economic activists and academics, the defence of the *status quo* and isolation from the outside world is no solution. Failure to introduce reforms will lead to another slowdown of the economic development of Europe, which will prevent funding for social tasks. Changes should aim at using the ESM achievements to date, such as the improvement in medical condition of the population, longer life expectancy or universal education, in order to increase the economic activity of European societies, fundamentally change the structure of stimuli for development of initiative, activity and independence based on knowledge and improvement of skills. The keys to the success are knowledge and work. They are the things that can give Europe durable development dynamics and the capability to attain important social goals.

The authors, who are critical of the policy to date, predict that the European Social Model will collapse soon. They indicate that the new situation does not cancel the need for the welfare state but rather results in the shaping of a new model of the state, which has three basic directions: stimulation of economic activity of individuals and social groups, struggle against exclusion and poverty, and development of equal opportunities. The fundamental way to modernise social policy is to direct it towards stimulation of economic activity (welfare-to-work), which is attempted through such means as making job markets and employment law more flexible, developing new forms of employment contracts, reducing fiscal burden on wages, and launching activity stimulation programmes addressed to specific social groups. Increased economic activity is also to be achieved by social services, including education and healthcare.

An important component of the income redistribution system is the tax system, and its level and structure significantly affect not only public funds and achievement of social goals, but also economic activity. A tax system is efficient if

it results in minimum distortion of resource allocation in an economy and minimum loss in production and income. Therefore, an efficient tax system makes faster economic growth possible. The analysis of the existing tax system leads to the following conclusions. Firstly, tax level in the EU countries is generally high and exceeds the tax level in the remaining OECD countries. This may reduce the growth potential through negative impact on stimuli to work, invest, save money and allocate resources in general. Statistical research shows that there is a negative correlation between the tax level and the economic growth rate in the EU countries. It particularly concerns marginal personal and corporate income tax. Secondly, the actual tax burden measured using the TTR (Total Tax Rate) index developed by the World Bank differs from nominal rates in individual countries. From this perspective, the most efficient tax systems are those in the Anglo-Saxon countries and, in spite of high nominal rates, Scandinavian countries. Thirdly, the analysis of tax structure shows positive relationship between the proportion of direct taxes in tax revenue and the economic growth rate. In countries where direct tax constitutes a larger portion of tax revenue, the average economic growth rate is higher than in countries where the proportion of direct taxes in total tax revenue is lower. Fourthly, individual countries significantly differ in the complexity of their tax systems. The least complicated systems exist in Anglo-Saxon countries, and the most complicated ones function in the new EU Member States. Fifthly, proportional tax system is attractive from the perspective of economic efficiency. This results from the stimuli that reinforce the willingness to work and start a business, simple structure, and low cost of application. The introduction of a proportional (linear) income tax is usually accompanied by a significant influx of direct foreign investments and drop in fiscal burden for citizens, which has a positive effect in the form of increased consumption and investment, which in turn leads to increased economic growth.

Rationalisation of the tax system in the face of increasing public debt, on the one hand, and growing needs of the society, on the other, is becoming the most important problem of the modern world.

Welfare spending does not have to preclude competitiveness and economic growth. Numerous studies demonstrate that spending on social goals may, to some extent, contribute to economic growth due to their positive effect on workforce qualifications, provision of necessary public services, and reduction in uncertainty (Rodrik 1998; De Grauwe, Polan 2003). In principle, such measures also contribute to the development of social capital, which is an important factor for development. At the same time, the available empirical data show that if the spending on social goals is excessive or their structure is incorrect, they may hamper economic growth and reduce competitiveness. This suggests that there are opportunities to rationalise social policy measures in many countries.

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