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The purpose of the study is to analyze the effects of CAP measures 2014-2020 for the agri-food sector and rural areas of selected EU Member States and third countries.

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Foreword

2013 was another important breaking point for the European Union in historic and economic terms. The questions asked at that time (for which we do not always have a clear answer) related to the new economic, social and environmental challenges. At the same time, the majority of Member States was still struggling with the effects of the global economic crisis. Their governments were trying to address the effects of the crisis with the use of various methods, while pursuing many objectives. Consequently, the policies were not only competitive, but often contrary to each other.

In the attempt to address the modern challenges, everyone is seeking an answer to the questions: "What will be the condition of the European Union agriculture in a medium and long term and will it be up to par in the context of global competition? What is and what will be in the future the impact of agricultural policy instruments on the improvement of market mechanisms which as such are far from perfect?" Deep changes in the global food economy mean e.g. that the new economic powers emerge and Europe is losing distance to them. Therefore, will the new CAP for years 2014-2020, with the new budget and new priorities, be stable enough to address them? And if yes, should the policy objective rather involve the improvement of effectiveness of agriculture and food industry, or the environmental protection and sustainable rural development, and what the relationships between the social, economic and political objectives should be? Or perhaps, should the new policy focus rather on the situation of farmers and their living conditions, in particular in small farms, which means a shift from supporting producers to the producers themselves? Can agriculture be exclusively focused on the market and improvement of competitiveness?

The new EU CAP for years 2014-2020 suggests that the introduced changes are no revolution and the possible movement of funds from the first to the second pillar is even a step back. In the last 20 years, CAP was more focused on the market than on production growth. However, despite all those changes, we do not have effective competitiveness improvement mechanisms. The adjustments introduced to the new CAP pose a threat to active agricultural holdings which should be the main beneficiaries of agricultural policy. Support for the small, unprofitable farms permits them to stay on the market, which implies indirect taxation of the most effective producers. As a result, farmers sometimes boast more about their use of various sources of financial support than about the achieved economic and production effects.

The changes adopted in the EU agricultural policy for years 2014-2020 are certainly the result of a political compromise. However, the EU and national funds also attempt to address new challenges and needs, such as innovative management and the transfer of knowledge, preservation of natural environment and solving social problems in rural areas, including employment matters. EU Member States may flexibly formulate their own priorities, including the proportions of the financing from the first and the second pillar and the amount of support for different types of agricultural holdings. However, those choices are not easy and they certainly are, to a great extent, political. Therefore, it is more difficult to solve those dilemmas at the national level than at the EU level, e.g. in the case of a fragmented agriculture. Thus EU solutions must provide for such a degree of flexibility that respective Member States could choose the best solutions.

The abovementioned problems were the subject of the international conference entitled "New EU agricultural policy – continuation or revolution?", organised by the Institute of Agricultural and Food Economic – National Research Institute from 9 to 11 December 2013 in Jachranka under the Multiannual Programme 2011-2014 "Competitiveness of the Polish food economy in the conditions of globalization and European integration". At the conference, during the six plenary sessions, discussion panel and workshops, the total of 24 papers were presented. The debates related not only to the changes in CAP, but also to the adjustment of agriculture and food industry producers to the future requirements of the market. The new challenges for the European agriculture imply that changes must cover not only the management of agricultural holdings, through the introduction of new technologies, but also the components of business management, considering an agricultural holding is a business, and broadly understood risk management. Farmers should act as managers and react to the changes in the market situation. This would hopefully change the approach to agricultural education and guidance.

The present volume is composed of 14 chapters divided into three thematic areas: I. The new Common Agricultural Policy – economic perspective; II. The new Common Agricultural Policy – sustainability and social and environmental objectives; and III. The new Common Agricultural Policy – third country perspective. The studies have been developed by experts from various scientific centres, both Polish and foreign.

The economic dimension of the new Common Agricultural Policy has been discussed in seven studies. In the first chapter of this monograph, dr Piotr Chechelski assesses the potential of Polish agriculture and the importance of the new Common Agricultural Policy (CAP) programmes 2014-2020 for the im-

provement of its competitiveness in the European Union (EU) and worldwide. In his study, the author claims that, without an improved effectiveness and productivity, neither the competitiveness of Polish agriculture would improve, nor would the income of agricultural producers increase. He also states that implementation of too many objectives provided for in the 2014-2020 programme may affect the competitiveness of Polish agriculture and that modification of certain CAP instruments related to environmental protection (greening) may lead to the deterioration of competitiveness of certain agricultural producers. CAP reform does not contribute to the development of the largest competitive agricultural holdings or to their specialisation. According to the author, the most effective measures are the programmes in support of active, young, well-educated agricultural producers, transfer of knowledge, innovation and information, as well as projects aimed at diversification of production at agricultural holdings. In the author's opinion, financial reinforcement of the first pillar of CAP at the expense of the second pillar would foster the development and competitiveness of Polish agriculture. Polish experiences to date proved that Polish agriculture was most stimulated by the Rural Development Programme (RDP).

In the second chapter, Werner Kleinhanss presents the effects of direct payments in terms of their distribution and income in the context of the new CAP, using the example of Germany. The author emphasises that the payments to date were much diversified depending on the orientation of production and on the region. Consequently to the introduction of the new CAP, this system will be simplified. The net budget for direct payments will be lower than in the case of the previous programming period. Lower payments will be allocated to large agricultural holdings with intensive production, while greater support has been provided for young farmers and agricultural holdings situated on less favoured areas. The characteristic feature of CAP is its regionalisation. According to the author, despite the modifications, the essential objectives of CAP have not changed.

The forecasted effects of the new CAP in one of the agricultural regions of Germany are discussed by dr Peter Sanftleben in chapter 3. In the author's opinion, food industry in Mecklenburg is driven by the proximity of three markets: Hamburg, Berlin and Szczecin, whose demand for food products has contributed to the development and modernisation of agricultural holdings in that region. Agriculture in Mecklenburg is intensive and production is based on modern technologies which ensure high economic viability and competitiveness, which translates into an increase in land prices. The author emphasises that although the farmers' unions will not be satisfied with the changes in CAP, since such changes lead to lower subsidies for the region, from the political and scientific point of view, the directions of the modifications are both justified and acceptable.

In the next chapter, dr Pierre-Yves Lelong, dr inż. Joanna Tyszko and Sebastian Filipek-Kaźmierczak focus on the impact of the new CAP on the competitiveness of agricultural enterprises and food industry in France. Agriculture and food industry are crucial sectors in France, both in terms of jobs creation and the balance of trade and in terms of GDP. Agri-food processing is the largest sector of the French industry. According to the authors, despite the position of the agri-food sector, changes in CAP are necessary that would be further reflected in the government reform programmes. This results from the historical inconsistency in the developed structure of support. Due to the great diversification in the level of payments, the French government has decided to apply a different breakdown of support, including the identification of priorities for agricultural holdings specialising in animal production, young farmers or modernisation of agricultural holdings and infrastructure. This should lead to improved competitiveness of the currently the weakest groups of farmers.

Structural changes in the animal production sector as a challenge for the new CAP on the basis of the example of Lithuania is discussed by Artiom Volkov in the next chapter. The author emphasises that the sector of farm animals is critical for the resilience of rural areas, since it ensures diversification of the farmers' income and boosts employment in rural areas. However, in the last five years the share of agricultural holdings breeding animals in the total number of agricultural holdings has decreased significantly in the EU Member States. Changes in the structure of agricultural production on farms in Lithuania based on the reduction of livestock and crop growth results from the following factors: the policy promoting direct support and decoupling and the decrease in national support. In his study, the author assesses the ratio of payments for plant cultivation and for animal breeding which reflect the optimisation of net income of Lithuanian farmers.

The impact of the current and the new agricultural policy on the development of main crops in Bulgaria is discussed in the next chapter by dr Bożydar Iwanow. The author claims that allocation of subsidies is uneven and that they have great impact on the structure of production despite being decoupled. In the opinion of the author, the new CAP will maintain the differences between direct payments in respective Member States, thus the convergence will be still gradually proceeding. To sum up, the structure of crops in Bulgaria will remain unchanged because the role of subsidies as a factor that boosts the development of agriculture will be only slightly reduced.

In the next chapter, dr Dan-Marius Voicilas and dr Camelia Gavrilescu present the results of the analysis of global trade in agri-food products and the role of the EU in this respect, including Romania. According to the authors,

CAP has contributed to the development of production and exports. Although the share of the EU in global trade has slightly decreased, the EU maintains its position as one of the largest actors on the global market of agri-food products. After 2007, the post-accession deficit in foreign trade in agricultural products in Romania has been gradually decreasing. The accession has placed Romania in the group of significant exporters, such as France, Germany, Italy, the United Kingdom or Poland. According to the authors, the effects of enlargement are positive, mainly through the opportunities offered by the free market.

The new CAP will define the conditions of operation for agricultural producers and food industry enterprises in the EU Member States. It will have a specific economic impact reflected in the profit and loss accounts of respective entities. Nevertheless, apart from the agri-food industry, the implications of the discussed policy are much broader, for instance, the ones relating to its mutual and diverse relationships with entities from the business, social and environmental areas.

Prof. J. Kulawik, dr M. Soliwoda and dr J. Pawłowska-Tyszko discuss the matter of sustainability of agriculture. Due to the growing pollution of natural environment and the increasing role of agriculture in evoking external effects there is a need to analyse the correlations between this economic sector and finance. The authors claim that the impact of subsidies and taxes on sustainability is limited and the correlations between those instruments and agriculture may be loosened. Therefore they point out to other market and non-market tools of reconciling environmental and economic objectives (optimisation of agricultural production or the environmental agent). The discussion is theoretical and may form the basis for further research.

Long-term priorities of the EU are also related to sustainable social development. In the context of ageing of rural population, depopulation of rural areas and decreasing economic role of agriculture, this objective is a considerable challenge. Changes in labour and economic activity of rural population on the basis of Poland are analysed in the next chapter by dr P. Chmieliński and dr B. Karwat-Woźniak. The authors claim that, regardless of negative demographic trends, the age structure of rural population remains relatively good. Another positive factor is the systematically improving level of education of this population. Experts from the Institute of Agricultural and Food Economics – National Research Institute also discuss the decreasing labour inputs in farmers' families as one of the symptoms of deruralisation of Polish rural areas.

The prospects for the competitiveness of European agriculture are marked by climate changes, whose impact is diverse. Extended vegetative period or increased average temperature will provide the opportunity to introduce new crops. On the other hand, shortage of water resources, increasing risk of erosion

or vehement weather events will form barriers for agricultural management. In this context, as dr K. Prandecki points out, it is necessary to take appropriate adjustment measures. The author of the study entitled "Agriculture and climate changes" points out that adaptive projects should be comprehensive and include a cautious and long-term planning process. In the opinion of the expert from the Institute of Agricultural and Food Economics – National Research Institute, informing persons related to agriculture about the effects of climate changes is crucial in this respect.

Apart from the appropriate management of natural resources, the new CAP should support the income of farmers. Such aid may serve as a means to achieve not only consumption-related objectives. In the next chapter, prof. W. Rembisz and mgr A. Sielska analyse the impact of the benefits generated by agricultural producers through CAP instruments on the investment processes in this sector. The authors refer to the benefits obtained from EU funds as a "political pension" and prove their catalytic nature. The results showed inter alia that in a significant group of farms an investment growth rate was higher than the income growth rate from political rent.

For years, the EU has been striving to keep good political and economic relations with the neighbouring countries. Such cooperation covers various domains, among which trade in agricultural products is particularly important. The future CAP is essential for the development of economic relations between the EU and third countries and it is differently perceived by those countries.

In the case of Serbia, trade with the EU is particularly important due to the considerable scale of trading in agricultural products. In this context, much emphasis is put on competitiveness and rural development. This is analysed in detail in the chapter by prof. D. Cvijanovic, dr V. Paraušić and mgr P. Vuković. The main barrier for positive economic trends in rural areas in Serbia is poverty and regional economic imbalances. According to Serbian experts, this barrier may be reduced through creation of an environment that would be friendly for businesses, NGOs and family farms.

Dr O. Zhemoyda discusses the problem of agricultural production management in the context of global shortage of food and energy on the basis of Ukraine. The author claims that current research proves that the impact of renewable energy on agricultural production is very low. However, this is expected to change in the future, which in a longer perspective may be an opportunity for the development of Ukrainian agriculture. The sector is undergoing intensive restructuring and specialisation, which may improve its competitive position on the European and global markets. However, agricultural transformation is accompanied by acute social adjustments in rural are-

as, which, according to the Ukrainian economist, should be mitigated with appropriate measures taken by public authorities.

CAP is commonly criticised for its negative impact on the development of agriculture in many developing countries. In the last chapter of this study, dr Noureddin Driouech, dr Hamid El Bilali, dr Roberto Capone, Mgr Luigi Sisto, mgr Sinisa Berjan and dr Izabela Lipiński analyse the correlation between the current and future CAP and food safety in the Mediterranean countries, in particular in the countries located in the south and east of that region. According to the author, food safety in the EU is not at risk in the short term perspective, although in the longer perspective this might probably change. Limited access to food would affect the poor and the owners of small agricultural holdings, in particular from the Mediterranean region. Dr Driouech stipulates that the EU agricultural policy should seek a solution to this problem e.g. through providing support for a free and stable trade in agricultural products. Food safety would also improve if the EU lifted customs tariffs for agricultural products, limited subsidies and supported agriculture in the developing countries.

Editorial Committee

I. The new Common Agricultural Policy - economic perspective

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1. Evaluation of the potential of Polish agriculture and the impact of the new CAP programmes in 2014-2020 on increasing its competitiveness in the European Union and in the world

1.1. Introduction

Under the influence of global processes, in particular the growing liberalisation of the global food economy and changes taking place in the Community itself, the common agricultural policy of the European Union should evolve in the direction of greater market orientation. A priority for EU and Polish agriculture should therefore be measures to strengthen competitiveness and innovation in agri-food on world markets.

In most of the major legislation relating to agriculture and rural development strategies in the European Union, attention is drawn to the considerations of how to enhance competitiveness. The Lisbon Treaty of 2007 already emphasized the relationship between the objectives of the CAP in raising the productivity of EU agriculture. Also, in the strategy for sustainable rural development, agriculture and fisheries for the period 2012-2020 in Poland, one of five specific objectives concerns “growth in productivity and competitiveness of the agri-food sector". The strategy Europe 2020 also contains guidelines related to an increase in the competitiveness of European agriculture.

The European Commission in its proposals [COM(2003) 627, 2011] also identified improving the competitiveness of all types of farming and increasing the profitability of agricultural holdings as one of six major priorities. As can be concluded from the above, one of the most important tasks for both the EU and Poland is to increase international competitiveness in agriculture.

Under the European Model of Agriculture [Wigier 2013], which sets out guidelines for the long term development of Polish agriculture the two strategies are included. The first is on social competitiveness where we must take into account environmental factors and in the second economic competitiveness but to

a lesser extent. The latter is the primary objective of the Lisbon strategy, the former is the message of the sustainable development strategy [Zegar 2011]. Therefore, currently under the redevelopment strategy for Polish agriculture there is an assumption of a dual model of its development, based on modern family farms, capable of development and competitive on the international market. Other farms should base their development on methods which are more environmentally friendly methods for the ecosystem, enabling the use of existing environmental and socio-cultural strengths.

In this study, the subject of the analysis is to assess the imbalance in the current pace and condition of changes in the competitive potential of Polish agriculture compared to other EU countries by 2010, as well as the analysis of the impact of new programmes of the common agricultural policy in the years 2014--2020 to improve the competitiveness of Polish agriculture, from economic point of view of the countries of the European Union and in the world.

1.2. Changes in the development of Polish agriculture compared to other countries of the European Union in the first decade of the 21st century

Because of its earlier historical and economic conditions of entry to the European Union, Polish agriculture was hardly competitive in comparison with the countries of the former EU-15. It is important, therefore, to determine changes by comparing the Polish agriculture to agriculture of the EU countries in the sphere of production potential (land resources, labour, capital) and changes in the area structure of farms that happened in the first decade of the 21st century.

Land resources in the years 2000-2009 in the countries of the European Union there were significant changes in the agricultural area. At that time, their surface decreased by more than 5% from the 198,9 million ha to 188,4 million ha. A large decrease in the agricultural area in the EU was primarily the result of the changes that took place among the new members of the EU and the Mediterranean countries (table 1). The largest share of agricultural land in the European Union in 2009 were seen in: France 29.3 million ha (15.6%), Spain 27.7 million hectares (14.7%), the United Kingdom 17.3 million hectares (9.2%), Germany 16.9 million hectares (9.0%), and Poland 15.6 million hectares (8.3%). It is worth pointing out that Poland is currently ranked fifth in terms of utilized agricultural area, while in the year 2000 was ranked third (including the current members of the EU).

In Poland in the years 2000-2009 2.2 million ha of agricultural land dropped out of agricultural production and most among all the EU countries. A large reduction of the utilized agricultural area also took place in Spain (2.1 million ha), Italy (1.7 million hectares), Romania (1.4 million hectares), Lithua-

nia (0.7 million hectares) and Slovakia (0.5 million ha). In these countries, the loss of the utilized agricultural area was associated mainly with economic loss, weakest lands (e.g. as encouragement grants received from the EU on afforestation were used) and their seizure for non-agricultural purposes (for example, construction of infrastructure).

Against the background of European countries, the average quality of Polish soil is relatively low, because as many as 40% of our soils are characterized by poor quality, and thus low agricultural suitability [Nosecka 2012]. This is one of the reasons why measures aimed at enhancing the competitiveness of Polish agriculture, and for land resources face a number of barriers. Some of them are objective, for example natural conditions and difficult to change. However, some restrictions in the agro-technical domain can be mitigated or eliminated by the observance of the principles of rational management in agriculture. In Poland, it is necessary to introduce technical and technological progress causing moderate intensification of production. However, these activities require higher qualifications among those managing farms.

Labour resource. In 2010 in the EU was more than 21.7 million farming population, which represented 4.3% of the total population. In Poland this was at 5.7 million, which represented approximately 15.0% of the general population. Therefore, the Polish agricultural population accounted for about 26.7% of the farming population of the EU. Other countries with the highest number of the farming population were: Spain (2038 thousand), Italy (1968 thousand) and Romania (1802 thousand). However, its share in the total number of the population of these countries amounted to, respectively: 4.4%, 3.3% and 8.4%, so was definitely lower than in Poland (Table 1). The countries with the lowest percentage number of the farming population were: Slovenia (0.6%), Malta (1.0%), Belgium (1.3%), Luxembourg (1.4%) and United Kingdom (1.5%).

The rate of decline of the farming population in Poland in the years 2000--2010 was among slowest in the EU-27 – 22.2%, while the average in the European Union was – 29.8%. In 2000, the Polish agricultural population accounted for 23.5% of the farming population of the community, and in 2010 increased to close to 27.0%. In the Polish agriculture about 3 million people work, with 11 million in the Community as a whole. Our farmers represented 27.4% of all farmers in the EU in 2010. They are the largest labour resources among all the countries of the Union. Active working population in our agriculture in 2010 accounted for 7.7% of the total Polish population. Over the years 2000-2010 this number decreased by 803 thousand people, which also meant a very low rate of change compared with the majority of the community.

Table 1. Agricultural land, agricultural population, and professionally active population in agriculture, gross fixed assets and productivity in the agricultural sector of the European Union

Countries	Agricultural land			Agricultural population			Active working population in agriculture			Gross fixed assets in agriculture	Labour productivity
	million ha		Changes 2000-2009 in %	in thousand		Changes 2000-2010 in %	in thousand		Changes 2000-2010 in %	Changes 2005-2010 in %	2010
	2000	2009		2000	2010		2000	2010			
EU-27	198.9	188.4	-5.3	30971.0	21745.0	-29.8	14955.0	10714.0	-28.4	.	**32.2**
Austria	3.4	3.2	-5.9	411.0	282.0	-31.4	199.0	144.0	-27.6	125.2	42.2
Belgium	1.4	1.4	0.0	184.0	134.0	-27.2	79.0	59.0	-25.3	174.9	130.9
Bulgaria	5.6	5.0	-10.7	610.0	299.0	-51.0	228.0	124.0	-45.6	.	28.0
Cyprus	0.1	0.1	0.0	81.0	59.0	-27.2	38.0	30.0	-21.1	31.0	22.1
Denmark	2.6	2.6	0.0	202.0	141.0	-30.2	108.0	75.0	-30.6	95.1	121.3
Estonia	1.0	0.9	-10.0	156.0	119.0	-23.7	76.0	61.0	-19.7	69.0	9.7
Finland	2.2	2.3	4.5	308.0	208.0	-32.5	143.0	98.0	-31.5	104.6	37.6
France	29.7	29.3	-1.3	1976.0	1271.0	-35.7	878.0	573.0	-34.7	91.5	112.9
Greece	8.5	8.2	-3.5	1487.0	1085.0	-27.0	826.0	637.0	-22.9	116.7	15.3
Spain	29.8	27.7	-7.0	2934.0	2038.0	-30.5	1339.0	1015.0	-24.2	147.1	37.3
Ireland	4.4	4.2	-4.5	360.0	294.0	-18.3	166.0	149.0	-10.2	44.5	37.8
Lithuania	3.4	2.7	-20.6	514.0	323.0	-37.2	204.0	126.0	-38.2	75.4	14.9
Luxembourg	0.1	0.1	0.0	10.0	7.0	-30.0	4.0	3.0	-25.0	127.7	93.7
Latvia	1.6	1.8	12.5	286.0	208.0	-27.3	132.0	113.0	-14.4	52.0	7.6
Malta	0.0	0.0	0.0	7.0	4.0	-42.9	3.0	2.0	-33.3	111.3	58.5
Netherlands	2.0	1.9	-5.0	530.0	408.0	-23.0	269.0	213.0	-20.8	114.4	114.8
Germany	17.1	16.9	-1.2	2066.0	1295.0	-37.3	1016.0	661.0	-34.9	118.0	67.9
Poland	**17.8**	**15.6**	**-12.4**	**7270.0**	**5658.0**	**-22.2**	**3763.0**	**2960.0**	**-21.3**	.	**6.5**
Portugal	3.8	3.7	-2.6	1489.0	1095.0	-26.5	678.0	515.0	-24.0	88.7	13.5
Czech Rep.	4.3	4.2	-2.3	855.0	650.0	-24.0	431.0	327.0	-24.1	83.0	12.0
Romania	14.9	13.5	-9.4	3082.0	1802.0	-41.5	1739.0	868.0	-50.1	259.2	16.3
Slovakia	2.4	1.9	-20.8	496.0	387.0	-22.0	240.0	197.0	-17.9	84.5	9.1
Slovenia	0.5	0.5	0.0	38.0	13.0	-65.8	19.0	7.0	-63.2	99.4	156.0
Sweden	3.2	3.1	-3.1	314.0	239.0	-23.9	146.0	115.0	-21.2	123.6	41.2
Hungary	5.9	5.8	-1.7	1228.0	840.0	-31.6	452.0	322.0	-28.8	123.9	19.9
UK	17.0	17.3	1.8	1048.0	918.0	-12.4	529.0	475.0	-10.2	143.9	46.9
Italy	15.6	13.9	-10.9	3029.0	1968.0	-35.0	1250	845.0	-32.4	88.8	50.6

Source: Own compilation based on: Rocznik Statystyczny Rolnictwa 2011 and 2012 CSO Warsaw 2011, 2012.

In the case of active population working in agriculture for the period 2000-2010, its number in the EU decreased by 28.4% and in Poland by 21.3%. Share of Poles employed in the European agriculture at that time increased from 25.2% to 27.6%. It can therefore be concluded that the changes in labour resources in agriculture were slower than in the European Union. Poland is still the country with the highest labour force resources in the Community in terms of agriculture and the highest share of those living off agriculture and working in this sector of the national economy in the general population.

In the current market conditions, economic success is also the ability to adapt to changing conditions. This applies to agriculture in which knowledge plays a huge role. W. Poczta i P. Siemiński [2010] note that the status of the Polish farmers ' education is one of the factors inhibiting progress and transformation in agriculture and it has a negative impact on the quality competitiveness of human resources. This explains the slow pace of decline in employment in agriculture and slow changes in the agrarian structure.

In terms of level of education, especially higher education, Polish farmers have a significant gap that divides them from farmers in most countries of Western Europe [Nosecka 2012]. However, lowering the age and the increase in the level of education of farmers show increasing possibilities and opportunities for their use of innovative solutions in production and its organization. Without a doubt, these chances are the biggest in large area farms, whose owners and users hold the highest level of education and widely use information and communication networks. This is confirmed by the results of the research firm Martin&Jacob[1], where more than a half of the surveyed owners of farms with the area of more than 15 ha intends to increase the area of farms and almost 50% are planning to invest in modern agricultural equipment. Therefore, one of the main problems existing in agriculture is the proper use of resources, it is in fact critical to the competitiveness of our agriculture.

Capital resources As noted by W. Poczta [2012] in Poland, the “renewal of fixed assets is only in the case of machinery and equipment, and decapitalisation occurs in relation to buildings and structures and means of transport". Investment processes occur only in a limited number of farms, usually the largest, while stagnation, and frequently loss of net assets for the majority of farms.

The effect of changes in EU agriculture is a change in the structure of productive forces and production system evolves from a labour-intensive to capital-intensive one. In the case of Polish agriculture, labour force was replaced by technical progress only to a small extent. This is evidenced by one of the lowest productivities among the EU countries of Polish agriculture , which in 2010 was

[1] www.portalspozywczy.pl – 2012 (Accessed: 15.06.2012).

at 6.5 thousand euro/employee, while the average for 27 countries is 16.4 euro/employee, and, in the case of Denmark even 121.3 thousand euro/employee.

Area structure of farms is one of the main problems requiring a solution in the process of adaptation of Polish agriculture to the requirements of competitiveness posed by the European Union. Changes in it require a reduction in agriculture, enlargement in areas of farms and thus lowering manufacturing costs, which results in an increase in agricultural income. These problems also have a direct impact on the living conditions in the countryside.

By analyzing differences in the changes in the area structures of farms in the EU-27 and Poland in the years 2005-2009, it can be concluded that:

- The number of farms in the EU-27 countries decreased by 5.4%, the fastest in the group of up to 5 ha (-6.8%), but also in the group 5-20 ha (-2.4%) and 20-50 ha (-2.7%). In Poland at that time the number of farms decreased by-3.4%, and only in the group up to 5 ha by 6.5%. Polish farms in 2005 accounted for 17.1% of the total number of farms in the EU, and 17.5% in 2009. Agrarian changes are slower in our agriculture. This results in deepening of negative differences in the structure of Polish farms, compared to other countries of the Union;
- Farms of 5-20 ha represented 18,6% in the EU in 2009 (in 2005 – 18%) of all farms, their number decreased by 62 thousand, but their share in the structure of the EU increased by 0.6%. The highest share in the structure of farms in this group was seen for: Latvia 44.3%, 39.9% Estonia, Austria 39.6%, Denmark 38.5%, Sweden 37.6% and the lowest: Malta 2.7%, 3.1% Bulgaria, Hungary 6.6% and 6.7% Slovakia. In this area Poland had 26.5% of the farms and was one of the few EU countries (Romania, Bulgaria, Greece), where their number increased. The farms in this group (not including specialist farms) do not achieve the ability to recover production, because their income is low. Therefore, their number in most EU countries is declining. In Poland the opposite is the case. Over 4 years it increased by 21 thousand farms;
- Farms of more than 20 ha (and therefore farms which may attempt to compete on the world market) accounted for 10% in the European Union area in 2009; in Germany they represented 45.2%, 56.5% in France, Denmark 56.8%, 38,2% in the Czech Republic, while in Poland only 4.7%. The average size of a farm in the EU (in 2010) is 23.9 hectares, in Germany, 57.2 ha and 57.6 in France, Czech Republic – 183.4 ha, while in Poland it is only 10.3 ha.

An analysis of the changes that were made in the last period in the structure of the Polish farms shows that their direction was consistent with the objec-

tives of the CAP. However, the pace of these transformations is too slow and requires acceleration. The distance between our agriculture and the average for the EU-27 increases, not to mention developed countries. On this basis, it can be concluded that the Polish agriculture as a whole in terms of both the number and the structure of farms until 2010 belonged to the group of countries with a relatively low level of competitiveness among Member States of the European Union.

On the other hand, there is a group of economically strong farms, able to compete on the European market which official statistics on the structure of farms in Poland do not give justice to. J. Rowiński [2013] estimates that the number of vital farms exceeding the threshold of economic size, calculated with the measure of standard production (SP) 12 000 euros (52 000 PLN) – was in 2010 at 290 000, i.e. only 10% of the Polish farms. Representatives of the Ministry of Agriculture and Rural Development estimate this group at 300 thousand farms [Bujoczek 2013]. In addition, as noted by Chróścikowski [2013], "official structure of farms is somewhat fictional "in view of the growing importance of agriculture in land lease. According to estimates [Strelecek, Zdenek 2011], the share of land leased in 2007 in our country was 27.5% and in the following years it quickly increased. It can therefore be concluded that out of the total number of Polish farms in 2010 at 1507 thousand (according to the Census), only every fifth obtaining income from agriculture can be potentially competitive on the EU market.

Table 2. Number and the structure of farms in the European Union

Countries	Number of farms according to area groups in thousand					Changes 2005-2009 (%)					Number of farms according to area groups in %				
	2009										2009				
	total	< 5 ha	5-20	20-50	≥ 50 ha	total	< 5 ha	5-20	20-50	≥ 50 ha	total	< 5 ha	5-20	20-50	≥ 50 ha
UE-27	13700.0	9645.0	2553.0	804.0	698.0	-5.40	-6.80	-2.37	-2.66	0.87	100	70.4	18.6	5.9	5.1
Austria	165.0	55.3	65.5	33.3	11.3	-3.51	0.73	-7.36	-2.63	3.67	100	33.5	39.6	20.2	6.7
Belgium	48.0	12.2	13.7	13.3	8.8	-6.80	-10.95	-8.67	-6.99	3.53	100	25.4	28.5	27.7	18.3
Bulgaria	493.0	468.0	15.5	3.6	6.2	-7.85	-8.41	1.97	24.14	16.98	100	94.9	3.1	0.7	1.3
Cyprus	40.1	34.7	4.3	0.8	0.4	-11.28	-11.93	-6.52	0.00	0.00	100	86.4	10.6	2.0	1.0
Denmark	44.6	1.7	17.2	10.5	15.3	-13.73	-5.56	-13.57	-22.22	-7.83	100	3.8	38.5	23.5	34.3
Estonia	23.3	8.4	9.3	3.0	2.6	-16.19	-33.33	-7.00	0.00	13.04	100	36.1	39.9	12.9	11.2
Finland	68.2	6.6	23.3	24.2	14.1	-3.40	1.54	-5.67	-7.63	6.02	100	9.7	34.2	35.5	20.7
France	527.0	130.0	101.0	99.0	197.0	-7.05	-12.16	-8.18	-9.17	-1.50	100	24.7	19.2	18.8	37.4
Greece	860.0	655.0	168.0	30.3	7.1	3.12	2.99	3.70	7.45	1.43	100	76.2	19.5	3.5	0.8
Spain	1044.0	551.0	280.0	112.0	101.0	-3.24	-4.51	-3.78	0.90	1.30	100	52.8	26.8	10.7	9.7
Ireland	128.2	8.4	46.7	50.4	22.7	-3.39	-8.70	-3.91	-1.56	-3.81	100	6.6	36.4	39.3	17.7
Lithuania	230.0	139.0	71.1	13.0	6.9	-9.09	6.92	-30.29	-13.33	16.95	100	60.4	30.9	5.7	3.0
Luxembourg	2.3	0.4	0.4	0.4	1.1	-8.00	-20.00	-20.00	0.00	0.00	100	17.4	17.4	17.4	47.8
Latvia	108.0	44.1	47.8	10.8	5.1	-16.28	-27.59	-9.13	0.00	15.91	100	40.8	44.3	10.1	4.8
Malta	11.0	10.7	0.3	0.0	0.0	-0.90	-0.93	50.00	-100.00	0.00	100	97.3	2.7	0.0	0.0
Netherlands	76.7	21.5	23.1	21.0	11.2	-6.23	-8.90	-6.85	-7.89	4.67	100	28.0	30.1	27.3	14.6
Germany	370.0	83.6	119.6	81.9	85.4	-5.13	-5.00	-7.14	-7.46	0.95	100	22.5	32.3	22.1	23.1
Poland	**2391.0**	**1637.0**	**629.0**	**101.0**	**23.6**	**-3.43**	**-6.51**	**3.45**	**4.34**	**14.01**	**100**	**68.5**	**26.3**	**4.2**	**1.0**
Portugal	275.0	200.0	53.5	12.2	9.8	-15.12	-17.36	-8.55	-4.69	-4.85	100	72.6	19.4	4.4	3.6
Czech Rep.	39.4	19.8	8.5	4.5	6.6	-6.86	-11.61	-6.59	2.27	3.12	100	50.3	21.6	11.4	16.8
Romania	3931.0	3531.0	370.0	16.1	14.4	-7.64	-8.78	4.23	0.00	4.35	100	89.8	9.4	0.4	0.4
Slovakia	69.0	60.2	4.6	1.4	2.9	0.73	-2.43	48.39	27.27	11.54	100	87.2	6.6	2.0	4.2
Slovenia	75.3	44.5	27.7	2.8	0.4	-2.46	-2.84	-3.15	16.67	33.33	100	59.1	36.8	3.6	0.5
Sweden	72.6	10.9	27.3	16.5	17.9	-4.22	-2.68	-3.19	-6.25	-4.79	100	15.0	37.6	22.7	24.7
Hungary	626.0	560.0	41.6	12.4	12.2	-12.45	-12.64	-13.33	-11.43	4.27	100	89.5	6.6	2.0	1.9
UK	300.0	119.0	60.1	46.5	74.0	4.53	11.21	2.39	-0.43	-0.67	100	39.7	20.0	15.6	24.7
Italy	1679.0	1231.0	325.0	83.4	40.0	-2.89	-3.22	-3.56	2.21	3.63	100	73.3	19.4	5.0	2.4

Source: Own work on the basis of Rocznik Statystyczny Rolnictwa (the Statistical Yearbook of Agriculture) CSO 2011, p. 373 and Statistical Yearbook of Agriculture COS Warsaw 2012, p. 415.

1.3. Impact of new programs under CAP in 2014-2020 resulting in an increase in competitiveness of the Polish agriculture in the European Union and in the world

Integration with the EU has not caused a reduction in differences in the level of competitiveness between Polish farms and farms in developed countries in the EU, nor has it significantly increased agricultural production size in Poland. By contrast, it has contributed to over a double increase in the income of farmers. However, they do not encourage the farmers to a sufficient extent to increase production efficiency as well, in particular in small farms. On this basis, it can be concluded that, in the current shape, CAP has become out-of-date to some degree because it does not solve all occurring problems that affect the Polish agriculture. Therefore, new solutions are required here both on the part of the European Commission, but also on the part of the state and its bodies.

A question thus arises whether new development trends of programmes and the amount of funds contained in the new financial perspective for 2014--2020 for Poland will be able to cause that the Polish agriculture will be able to address the challenges faced by it in the context of international competitiveness. Especially since – given the discrepancies that took place in the course of determining the CAP tasks and the last budget between the Member States of the Community – one can expect this is the last such a big project, and state aid for the Polish and the European agriculture as a result of liberalisation of the world economy will probably play a smaller role after 2020 than today. Therefore, the new CAP programme for 2014-2020 is so important.

On the basis of literature research, most important issues have been presented that may have impact on increasing competitiveness (from the economic point of view) of the Polish agriculture on the international market and an attempt to divide in this aspect the instruments and activities from the 1st and 2nd pillar proposed by the Commission for 2014-2020 (Table 3 and 4).

Small agricultural holdings The new financial perspective of CAP for 2014-2020 has particularly exposed the role that is to be performed by small agricultural holdings in the European model of agriculture. It was reflected in the instruments and measures aimed at strengthening the market position of these farms both in the 1st and 2nd pillar, for example by: a lump-sum direct payment for small farms, reduction of support for large farms, diversification of income in the 2nd pillar, development of thematic subprogrammes under RDP for small farms, etc.

One of the most important issues for increasing the competitiveness of the Polish agriculture is to find a proper solution of the problem of small farms. As it is noted by B. Wieliczko [2012], farms from this category „in most cases do

not guarantee the income at the level making it possible to provide maintenance of the family of a farmer and not have appropriate development potential, including the investment capital. At the same time, all resources involved in these entities, in particular labour and land, are not optimally utilised". Reduction in the number in this group of farms should proceed evolutionarily, but rather quickly. It should be also connected with access to public funds (support), selection of relevant instruments and information and consulting.

The scale of the problem (the number and importance) of small agricultural holdings in Poland is definitely different than in most developed countries of Europe and some countries of the world. An average farm in 2010 in Poland had only 10.3 ha and was one of smallest among the European Union Member States. While farms in Australia, USA or in South America have often several, and sometimes over one hundred thousand hectares. For comparison, the average the size of a farm in Brazil amounted to 64 ha, in USA 170 ha, in Canada 315 ha, and in Australia 3000 ha, and an average farm in the European Union has 24 ha. Differences in size of agricultural holdings should be the basis for further discussion on the criteria for support of agricultural holdings in the EU, in particular in Poland. Differences in the economic situation of small agricultural holdings are also significant.

Direct payments The impact of individual instruments of the European Union's Common Agricultural Policy is diverse, but direct payments were and still are the primary instrument of support for the Polish agriculture, also in the new perspective. They have also been the topic of many debates and diverse views on them for years.

Changes in the hitherto Common Agricultural Policy were postulated by so well-known economists as: S. Tangermann and M. Hofreither [Walkowski 2012] – first of all the maximum reduction of any interventions and subsidies from the first pillar of CAP in terms of price and income and gradual abolition of direct subsidies. According to their philosophy, the fight against poverty in the rural areas (also in social farms that are not connected with the market) should be addressed by social policy, and not by the agricultural policy of the state. Also other authors involved in this field veer towards the opinion that direct payments are to a significant extent earmarked for consumption, and to a significant extent for development of agricultural holdings. Such opinions are represented, among others, by W. Meyers and J. Ziółkowska [2013], who write that: "payments will slow down structural changes and growth in productivity in comparison with a situation when there are no payments. Marginal producers, i.e. those who withdraw from production if income drops, will be in the produc-

tion sector longer, which will lead to inefficient use of resources. Latent inefficiency in the use of resources in the sector of agriculture will continue to exist".

M. Zagórski [Iwański 2013] also believes that "the system of direct area payments has a major defect consisting in the fact that it encourages the farmers who do not want to be in agriculture and do not want to make a living from it to keep the land. They receive easy money practically for nothing." Therefore, under the pressure of criticism, the European Commission suggested modifications in the programme for 2014-2020 in the allocation of the 1st pillar Of CAP. Currently, there are two components for direct subsidies: the basic payment (70% of the envelope) and pro-ecological payment (30% of the envelope). Under basic payments, the following have been identified: payment for young farmers (up to 2%), coupled support (up to 15%), support for areas with natural handicaps (to 5%), simplified system for small farms (up to 10%).

J. Kulawik [2012] believes that such solutions for the functioning of direct payments do not change of philosophy of application of this instrument, but introduce considerable alterations that will result in significant costs on the part of payment agencies. Also farmers can bear the costs of adjustment to the changes and later transaction costs of using subsidies. However, it should be pointed out that the scale and cost of adaptation will be very diverse, depending on the present degree of compliance with the requirements that will be mandatory. Also M. Wigier [2013] believes that direct support results in numerous, often mutually contradictory effects in agricultural holdings and their environment.

Different beliefs, on the other hand, are presented by W. Czubak, K. Pawlak [2008], who argue that 93% of the amount of area payments received by agricultural holdings in 2004-2008 was intended for production. Direct payments can also be treated as relatively constant and certain element of the household budget, which is of importance not only for possible investment to be implemented using own resources of farms, but also for the opportunities to make investments financed by external sources. In the latter situation, a positive effect of receiving payments would be demonstrated by the use of the future stream of income from the payments as a collateral of the loan. Therefore, basic payments not entirely can be considered to have only a negative impact on competitiveness of the Polish agriculture because they provide individual farmers with an opportunity to choose the amount and intended purpose of the funds for goals: either for consumption or investment.

Table 3. Instruments that have a potential impact on growth in competitiveness of the Polish agriculture in 2014-2020 (the 1st pillar)

The implementation measures	Assessment
Basic payment	–/+
Pro-ecological payment	–
Simplified system for small farms	–
Coupled support	+
LFA payment	–/+
Payment for young farmers	+

Impact: + directly related to competitiveness
– indirectly related to competitiveness
+/– difficult to specify, dependent on project implementation

Source: own study on the basis of Regulation of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) COM(2011) 627 final, Brussels, 12.10.2011, p. 8-9.

A disadvantageous solution for the improvement in competitiveness of the Polish agriculture, at least in a short term, is represented by **pro-ecological payment** referred to as "greening" since to a certain extent it limits the specialisation of farms forcing them to grow at least 3 crops. In addition, it will be required to allocate 5% of arable land for organic areas. It should be pointed out that there are the areas where such measures may substantially reduce agricultural production, e.g. in Greater Poland, Żuławy, etc. In the case of some farms, in particular the large ones, "greening" may thus mean increase in the costs of functioning and a decrease in their competitiveness. Also a representative of the Ministry of Agriculture and Rural Development Z. Szalczyk states that "greening" to the greatest extent affects farms above 30 ha of arable land. They will have to comply with diversification of crops in the full range and allocate a part of land for environmentally friendly crops.

However, most people arguing that greening will result in a loss, in particular for large farms, and at the same time, they agree that it is necessary to introduce its, recognising the arguments of the Commission as the need make the whole CAP more environmentally friendly or, as explained by Z. Szalczyk [Bujoczek 2013], "it is the price that agricultural environments pay for the agreement of the public in the EU that agriculture receives the largest part of funds from the budget. Environmental protection makes it possible to explain to the inhabitants of big cities where this money goes".

In CAP in 2014-2020, financial support entitled **simplified system payment for small farms** has been planned for small farms in the 1st pillar. As

stated by M. Zagórski [2011], this system is "definitely of social and passive nature for minor producers, limiting the requirements and exempting from performing any development activities in a farm. This system will definitely perpetuate the existing structure of farms. At the same time, one should doubt the opportunity to increase the competitiveness of farms by means of it[2]".

Support for agricultural holdings with a low level of efficiency may have negative long-term consequences not only because of production decrease, but also as a result of strengthening of claim groups. As stated by J. Wilkin [Śmigiel 2009] "removal of subsidies from the smallest agricultural holdings, referred to as subsistence farms (the ones that produce mainly for own needs) would accelerate changes in rural areas. Owners of small farms would have to choose whether they prefer to search for work beyond agriculture or invest and develop the farm. This is, however, a politically sensitive issue."

LFA payments. Now, only biophysical criteria for designation of LFAs (which exclude the use of the social criterion that accounted for a substantial part of areas currently determined as LFAs in Poland), which may result in a limitation of this area and a territorial shift. Therefore, it will not significantly affect production growth and increase in competitiveness of the Polish agriculture. The benefit may be advantageous in particular for large farms because in such a payment there are no criteria to restrict their size. In the case of small farms, this payment will not significantly change their development situation.

Support to young farmers. Most opinions on this payment confirm its usefulness, especially in the context of increased competitiveness of the Polish agriculture, among other things because of the necessary demographic changes that should be made in our agriculture. In Poland there are about 100 thousand young farmers, that is approximately 7% of all who receive subsidies.

Young farmers usually have no funds that would enable business start-up and its development. Without them, investments or purchase of land, which facilitate achieving profits, is out of question. For this reason, a few of them have so far decided to take this type of risk. It seems that support provided for in the new CAP programme may induce many small farmers to act in an active, which may translate in the future into an increase in competitiveness of our agriculture.

Coupled support. In the case of Poland, up to 15% of the entire envelope intended for direct payments will be to be allocated for this goal, including 2% that have to be earmarked for support for production of protein crops. In comparison with the 2007-2013 reform the opportunities to support production in new sectors and types of production have been increased. This support is intend-

[2] According to the National Statistical Office (GUS), the number of farms with the area of 1-5 ha in 2010 amounted to 831,000.

ed exclusively for the maintenance of the previous production levels. Its purpose is to prevent decrease in production in the sectors that have some difficulties and that are of particular importance for economic, social or environmental reasons. In the case of Poland, this will apply first of all to increasing the sector of animal production, sugar beets, fruit and vegetables. It should significantly improve the competitiveness of these production sectors on the international market.

As regards RDP instruments, the number of activities decreased, but it is hard to conceive actually significant reduction in activities since this effect has been reached mostly through combination of several instruments separate so far into one measure. Currently (November 2013) follow-up public consultations and discussions on the adoption of the final version of the Polish RDP are still underway. The ultimate findings of the government with EU bodies about the amount of funds allocated for various measures are also is unknown. Therefore, it is difficult to determine their ultimate impact. One may only indicate which actions will be able to contribute to the improvement in competitiveness of the Polish agriculture on the international market (Table 4). It applies, first for all, to "Investments in fixed assets". This measure is aimed at increasing the competitiveness of the Polish agriculture and it is addressed to larger farms. However, it is a very complex measure, therefore it should be clearly specified which types of projects should be granted support or should be prioritised.

The measure "Farm and business development" is also complex and covers a wide range of support. However, it arouses a lot of controversies. M. Zagórski [Iwański 2013], for example, stated that "it will mean giving away even more money in comparison with the present support to semi-subsistence farms"[3]. By contrast, annual payments to farmers involved in trade system for minor to agricultural producers who ultimately have transferred their farm to another farmer are supposed to be a substitute of "structural pensions". B. Wieliczko [2012] believes that "this category of support should not be implemented in Poland at all. These payments are not sufficiently high so as to be an equally attractive support as benefits received under the "structural pensions", and which also did not prove useful.

[3] He argues that a small farm that produces for the market for an amount of EUR 2-15,000 annually will be able to receive PLN 60,000, provided that it presents a business plan, and they will be paid 80% of this amount in the form of advance payments. Besides, is not planned to use any sanctions, at least at this stage, for failure to execute this business plan. The only the sanction is failure to pay the remaining 20%. It means that it will do to write any business plan, get PLN 48,000 and do nothing. It is necessary to realise that the number of people willing to participate in such an action will be enormous and it will cost a lot of money.

Table 4. Instruments that have a potential impact on the growth of competitiveness of the Polish agriculture in 2014-2020 (pillar 2)

Implementation means – measures	Article of the Regulation on EAFRD	Assessment
Knowledge transfer and information actions	Article 15	+
Advisory services, farm management services	Article 16	+
Quality schemes for agricultural products and foodstuffs	Article 17	+
Fixed asset investment	Article 18	+
Restoring agricultural production potential damaged by natural disasters and catastrophic events and introduction of appropriate prevention actions	Article 19	+
Farm and business development	Article 20	–/+
Basic services and village renewal in rural areas	Article 21	–/+
Investments in forest area development and improvement of the viability of forests	Article 22	–
Afforestation and creation of woodland	Article 23	–
Establishment of agro-forestry systems	Article 24	–
Prevention and restoration of damage to forests from forest fires and natural disasters and catastrophic events	Article 25	–
Investments improving the resilience and environmental value of forest ecosystems	Article 26	–
Investments in new forestry technologies and in processing and marketing of forest products	Article 27	–
Setting up of producer groups	Article 28	+
Agri-environment-climate	Article 29	–
Organic farming	Article 30	+
Natura 2000 and Water framework directive payments	Article 31	–
Payments to areas facing natural or other specific constraints	Articles 32-33	–
Animal welfare	Article 34	+
Forest-environmental and climate services and forest conservation	Article 35	–
Co-operation	Article 36	+
Risk management	Article 37	+
Crop, animal and plant insurance	Article 38	+
Mutual funds for animal and plant diseases and environmental incidents	Article 39	+
Income stabilisation tool	Article 40	+
LEADER	Articles 42-45	+

Impact: +directly related to competitiveness
– indirectly related to competitiveness
+/– difficult to specify, dependent on project implementation

Source: Own study on the basis of Regulation of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) COM(2011) 627 final, Brussels, 12.10.2011, p. 8-9.

In the case of the concept of CAP, the measure **"Creation of producer groups"** may be if major importance in the support for small agricultural holdings. It will make it possible to create larger entities on the market that will be able to compete more effectively on it.

The measure under the name **organic farming** is to be connected not only with the size of area, as it has been so far, but also with organic production, which seems to be the right solution, yet it is an disadvantageous support from the point of view of competitiveness if it is limited only to 20 ha of area in those farms. Usually the effectiveness of agricultural holdings grows with their size, the environmental ones as well.

On the other hand, the measure **"Quality schemes for agricultural products and foodstuffs"**, which so far has not enjoyed particular popularity among the farmers [Wieliczko 2012], may gain importance in the new financial perspective. It is because with the growth in export of Polish agri-food products, quality requirements for raw materials for delivered from the farmers will increase, both for foreign trade and processing companies of the food industry.

The positive impacts of CAP resulting in increased competitive operations also include new instruments for risk management. They can become an important element for **creating a safety network**[4] in the agriculture. In the case of Poland, it will require, however, intensive informational and promotional activities in order to disseminate knowledge about the functioning of the funds for mutual investment and popularisation of this instrument [Kulawik 2013]. They are very important not only at the moment, but will be also in the future. Probably after 2020, along with liberalisation of trade in the world, the EU will have to reduce support in the form of direct payments for instruments related to production risk or environmental protection. This will be the future measures to support competitiveness of the European and the Polish agriculture. As regards the safety network, insurance funds, apart from protection cover of yields against natural disasters and losses as a result of animal diseases will include options for stabilising the income in case of a decrease in prices based on funds mutual[5].

The European Commission also announced that it will introduce a number of new solutions concerning the creation and functioning of the trade associations, international organisations and principles of their dissemination. The solutions in this respect are to make it easier for agricultural producers **to co-**

[4] The "safety network" includes the following measures: risk management; insurance of crops, animals and plants; funds for joint investments involving diseases of animals and plants and environmental incidents, a tool for stabilization of income.

[5] In the case of over a 30% decrease in the income, the fund of mutual insurances will cover up to 70% of the loss. For every EUR 1 paid to the fund by a farmer, EUR 0.65 will come from RDP funds.

operate, and, at the same time, to provide equal competition conditions for all European farmers. Development of special instruments (financial and legal ones) is supposed to serve this objective. This action is valuable when it comes to building the competitiveness of the whole agri-food and sector. The measures **"Knowledge transfer and information actions"** and **"Advisory services, farm management and farm relief services"** should play a crucial role in human resource development.

There will be even more opportunities to implement **innovations** after 2013 than before, and measures to support knowledge transfers, advisory services, investments in tangible assets or co-operation will be particularly important[6].

Innovation progress in the Polish agriculture will be dependent on the largest possible and effective use EU funds for support, the scale of available funds, the support from the domestic budget and "willingness" of farmers to organise themselves and give up conservative attitudes towards the introduction of new solutions, which, in turn, depends to a great extent on the quality of workforce in the Polish agriculture (education). The results of this action should be expected in a longer perspective.

The measure "**Advisory services, farm management services**" makes it possible to support the farmers, but also the non-agricultural sectors of the rural economy, which is a very important task in the process of conversion of the Polish rural areas. The sector of small enterprises often faces numerous development barriers in access not only to capital, but as a result of absence of professional services of advisory companies, therefore, support of the sector in this respect should be considered a valuable initiative that makes it possible to decrease the number of people employed in agriculture.

Apart from these opportunities available under various measures as a result of using the **LEADER** methodology, the policy on the development of rural areas alone will be a tool helping to disseminate the results of creative thinking in new ways. Among other things through the inclusion of residents in the local matters, contribution to creation of new jobs within rural areas and promotion of the region. What is important, the approach under LEADER is relatively flexible and allows for activation of all the inhabitants of rural areas.

[6] Innovative measures will be implemented by operational groups consisting of the farmers, scientists, advisors, non-governmental organizations, but also entrepreneurs. The operational groups are to operate through cluster initiatives, innovation centres and pilot and demonstration projects.

1.4. Summary

The above-mentioned considerations imply that the issue of priorities of the future Common Agricultural Policy is extremely important, but it is also a complex matter and disputable in many aspects and even controversial. In the new financial perspective, through Common Agricultural Policy, the European Union wants to pursue several objectives at the same time, which are often competitive towards each other. On the one hand, for example, it wants to have cheap food while, on the other, stable income or support for small agricultural holdings and be a competitive food producer on the global market.

Production potential of the Polish agriculture (to a certain degree) determines the share in the area of arable land in the European Union and in the world, which is higher than the share of our agriculture in the value of production of the EU agriculture, which suggests that it is still not fully used. Just like the fact that over ten percent of agricultural holdings in Poland own less than half of arable land that produce nearly 2/3 of the national value of production of agricultural origin on the market.

In the first decade the 21st century, transformations in the Polish agriculture proceeded too slowly for us to make up the delay in comparison with the EU-15. There are concerns that, with the current pace of changes, also the agricultural economies of many EU-12 countries outdistance us. The characteristics of the Polish agriculture still include: a relatively (in relation to the countries of Western Europe) high level of employment, low work and land efficiency, unfavourable agricultural structure and low income from agricultural activities.

A lot of funds received from the EU and addressed to agriculture in 2002-2013 accelerated its modernization, but it is still not competitive in comparison with the EU agriculture. The subsidies, higher in the new financial perspective, for the Polish agriculture can once again weaken the pressure to improve the effectiveness of farming, to intensify agricultural production or to convert agricultural structures.

Opportunities to reduce and the pace of reduction of development distance of the Polish agriculture in relation to high-developed countries to a large degree depend on changes in the structure of agricultural holdings. The improvement in competitiveness of agriculture requires concentration of land by streamlining the flow of arable land from farms that are inefficient or not used at all for agricultural purposes to efficient farms. Technical modernisation of farms is also necessary, both in the case of ones with industrial and sustainable technologies. Slow pace of changes of the agricultural structure in the agriculture slows down the processes of modernization that determine the improvement in the efficiency of the use of agricultural production factors.

The new CAP reform is not conducive to development of the largest, the most effective and competitive agricultural holdings and their specialization (e.g. greening, reduction of subsidies). On the other hand, introduction of modern solutions to farms of small area, with a lower level education of farmers and of course for economic reasons is hardly effective and rather does not guarantee a significant increase in the competitiveness of our agriculture. That is why, in the case of Poland, measures under CAP should be primarily oriented towards medium and larger agricultural holdings. However, the threshold to limit the support to farms in Poland is too low (EUR 100,000). The European Commission should submit its proposals.

The subsidies received from the EU perpetuate the existing agricultural structures rather than changing them. In 2007-2013, they include such instruments as: support to semi-subsistence farms, structural pension and direct payments. By contrast, in the new financial perspective, such activities appear to be the following: simplified system for small farms, support to small agricultural holdings and annual payments to farmers who ultimately want to transfer their farm to another farmer, will still not gravitate significantly towards trade in agricultural land and inhibit outflow of workforce from farming. Therefore, the largest defect the new financial perspective of CAP for 2014-2020 is its limited scope of proposals aimed at adjusting the instruments to the challenges related to growth in competitiveness of the Polish agriculture on the European and global market.

Increase in competitiveness of the Polish agriculture in the new financial perspective will be dependent to a large extent on the will of the farmers themselves (in particular on investing in technical and organizational progress in their farms, as well as on self-organisation and departure from conservative attitudes towards the introduction of new solutions), but also on the development of the whole economy national in particular in the context of capacity to create new jobs outside agriculture and within rural areas.

The introduction of reforms in 2014-2020 in the Polish agriculture should not, however, significantly cause a decrease in the volume of agricultural production. By contrast, they may result in changes in production costs. The factors that increase production costs include: actions associated with the growth of environmental friendliness of CAP, with the introduction of new technologies, the growth of prices of land, utilities, taxes, labour, etc. On the other hand, factors that reduce production costs will include: a larger scale of production in the largest agricultural holdings, subsidies for production and financial support received from the EU for various actions, e.g. investment in fixed assets, young and active farmers, coupled support, etc. It should be expected that the speciali-

zation of farms will further increase, which will promote both growth in agricultural production and reduced production costs.

A significant positive impact on the changes in the structure of agricultural holdings in Poland will be exerted by the dynamically developing food industry, whose needs for inexpensive raw materials of good quality and in large quantities will be growing rapidly. And such raw materials can be guaranteed only by large, effective agricultural holdings. In the case of the food industry and agriculture, greater and greater importance will be attached also to the issues related to vertical integration, consolidation, investment projects in agriculture, elimination of food losses or added value of products.

To sum it up, it can be assumed that the impact of measures and programmes under the CAP in 2014-2020 has no chances for elimination of the existing differences in the level of the competitiveness between the Polish agriculture and the agriculture of the developed countries of the EU and even smaller odds in comparison with the global agriculture.

References

1. Bujoczek K., (2013), *Czy WPR wesprze rolników?,* Top Agrar nr 12.
2. COM 625, Proposal of the European Commission (2011a) for a Regulation of the European Parliament and of the Council of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy.
3. COM 627, Proposal of the European Commission (2011a) for a Regulation of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD).
4. Czubak W., Pawlak K., (2008), *Rozdysponowanie środków finansowych wynikających z mechanizmów Wspólnej Polityki Rolnej Unii Europejskiej na rozwój modelu rolnictwa industrialnego i zrównoważonego w Polsce,* [in:] *Z badań nad rolnictwem społecznie zrównoważonym,* IERiGŻ-PIB, Program Wieloletni 2005-2009, zeszyt nr 102, Warszawa.
5. Iwański R., (2013), *Nowe płatności i nowy PROW są nierozwojowe,* interview with M. Zagórski, Farmer – portal nowoczesnego rolnika http://www.farmer.pl (accessed on 13.12.2013).
6. Kulawik J., (2012), *WPR się obroni (chyba)?* Nowe Życie Gospodarcze, No. 3.
7. Kulawik J., Wieliczko B., (2013), *Finansowe uwarunkowania konkurencyjności rolnictwa* [in:] A. Kowalski., M. Wigier, M. Dudek (Eds.) *Propozycje rozwiązań WPR 2013+ a konkurencyjność gospodarki żywno-*

ściowej i obszarów wiejskich, Program Wieloletni 2011-2014, No. 61, IERiGŻ-PIB Warszawa.
8. Meyers W., Ziółkowska J., (2013), *WPR z perspektywy rolnictwa światowego* [in:] *Propozycje rozwiązań WPR 2013+ a konkurencyjność gospodarki żywnościowej i obszarów wiejskich* Ed. Kowalski A., Wigier M., Dudka M., Program Wieloletni 2011-2014, No. 61, Warszawa.
9. Nosecka B., (2012), *Czynniki konkurencyjności sektora rolno-spożywczego we współczesnym świecie,* Program Wieloletni 2011-2014, IERiGŻ-PIB, No. 54, Warszawa.
10. Poczta W., (2012), *Przemiany w rolnictwie ze szczególnym uwzględnieniem przemian strukturalnych,* [in:] J. Wilkin, J. Nurzyńska (Ed.), *Polska Wieś 2012 Raport o stanie wsi,* Wydawnictwo Naukowe SCHOLAR, Warszawa.
11. Poczta W., Siemiński P., (2010), *Konkurencyjność rolnictwa polskiego po przystąpieniu do Unii Europejskiej*, Poznań 2010.
12. Rowiński J., (2013), *PROW 2014-2020 a rozwój polskiej gospodarki żywnościowej* [in:] A. Kowalski., M. Wigier, M. Dudek (Eds.) *Propozycje rozwiązań WPR 2013+ a konkurencyjność gospodarki żywnościowej i obszarów wiejskich*, Program Wieloletni 2011-2014, No. 61, IERiGŻ-PIB Warszawa.
13. Strelecek F., Losova J., Zdenek R., (2011), *Farm land rent in the European Union.* Acta univ. agric. Et silvic, Mendel. Brun., LIX, nr 4.
14. Śmigiel S. (2009) *Zmiany w rolnictwie przebiegają za wolno,* Interview with Prof. Jerzy Wilkin, http://www.wyborcza.biz, 26.04.2009.
15. Walkowski M., (2012), *Wspólna Polityka Rolna Unii Europejskiej w perspektywie finansowej 2014-2020. Kontynuacja dotychczasowych założeń czy zmiana priorytetów rozwoju? – analiza stanowiska Polski* [in:] Toszek B., Wojtaszek A., *Perspektywy rozwoju Wspólnej Polityki Rolnej po 2013 r.* Warszawa.
16. Wieliczko B., (2012), *Zmiany w WPR na lata 2014-2020 a modernizacja polskiej Wsi i Rolnictwa,* Journal of Agribusiness and Rural Development 3(25).
17. Wieliczko B., (2012), *Propozycja instrumentów wsparcia w polskim PROW na lata 2014-2020,* SERiA, Roczniki Naukowe, Vol. XIV, Sheet 2.
18. Wigier M., (2013), *Model rozwoju rolnictwa polskiego w świetle efektów realizacji WPR,* Zagadnienia Ekonomiki Rolnej No. 1.
19. Zegar J., (2011), *Konkurencyjność rolnictwa zrównoważonego* [in:] *Z badań nad rolnictwem społecznie zrównoważonym* (11) Ed. J.St. Zegar. Raport PW nr 3. IERiGŻ-PIB Warszawa.

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2. Distributional and income rffects of direct payments under the new CAP – the case of Germany

2.1. Introduction

After two and a half year of intensive policy negotiations, the CAP post 2013 was finally decided upon at the end of 2013. Under the objective of maintaining the global agriculture budget it's a consensus of proposals by many policy interest groups with steps forward wrt (with regard to) new societal aims (greening) but also steps backwards wrt decoupling and a re-nationalisation due to manifold implementation options at the Member State level.

In Germany, the national implementation of Pillar-I measures was finally decided upon in November 2013. In the following proposals and final decisions wrt direct payments are described and distributional and income effects analysed based on FADN data based simulations. One main element of the New CAP is the transformation of historical levels towards regionalized entitlement levels. This measure has been implemented in Germany under the Mid-term Review and health Check of CAP. The German scheme will be taken as an example to show the distributional effects of the measure.

2.2. Model, data and scenarios

The analysis of the New CAP is not an easy task, as the links between the two Pillars change, too. In the past two reforms compulsory Modulation was used to transfer budget form Pillar-I to Pillar-II. This measure will now be cancelled and therefore the former gross Pillar-I budget will be redefined as a net-budget. In the New CAP, Member States can optionally convert up to 20% of Pillar-I budget to Pillar-II, with the advantage that national co-financing is not required. On the other hand, it is also possible to convert part of the Pillar-II to the Pillar-I budget, which has been negotiated in Poland, for example.

For the quantitative analysis a simulation tool using the statistical software package SAS has been developed. It is based on data of the German Farm Accounting Data Network (BMEL-Testbetriebe). A balanced farm sample over the economic years 2009/10 to 2011/12 has been selected. The full implementation of the regional model in 2013, the gross budget of Pillar-I and the amount of Modulation has been projected for 2013 and further periods. Policy measures of

the New CAP affecting the level and distribution of direct payments were included in the model. All calculations were done at the individual farm level; weighted results were aggregated at the regional and farm type levels using the weighting factors and typology of 2011/12. The model is comparatively static, meaning that farm adjustments wrt changing economic conditions are not considered.

In the **reference situation** (2013 and following years (post-reform)) the gross Pillar-I budget for Germany was 5.85 billion €, thereof 0.48 billion € transferred to Pillar-II via Modulation (Table 1). Payments were fully decoupled and implemented via regional flat rates with unified premium levels at the Länder level. In the **New CAP** only the net budget is determined; beside Modulation and a transfer of 0.34 billion € towards EU Member with area payments below the EU average, the net budget will be 5.02 billion €. Referring to a decision of the national court of justice regional flat rates will be converted into national unified flat rates in 2019. The 30% of the Greening budget will be implemented beginning in 2015 based on national flat rates. The base premium of 70-x% will be implemented in 2015 with a transformation of regional into national flat rates in 3 steps from 2015 to 2019. The x-schemes – meaning former Pillar-II measures, deduced from budget ex-greening – differ between the proposal and final agreement of the Committee of Agricultural Ministers (AMK).

Table 1. Reference and Implementation of CAP 2013 in Germany (Pillar-I)

	Reference (2013)	New CAP AMK proposal	AMK agreement
Budget	Gross: 5.852 bn € Modulation -0.48 bn €	Transfer to MS below DP average -0.342 bn € Budget net (2019): 5.018 bn €	→
Direct Payments			
Decoupling	full	→	→
SFP	regional FlatRates	national FlatRates (2019)	→
Modulation	10 (+ 4%)	-	-
Greening		30 %, nat FlatRate (>= 20e5) *)	→
Base premia		(70 - x)%, approaching net FlatRate	→
		in 3 steps 2015 to 2019	
(x) Schemes			
Additional payments First hectares		0-15 ha * 50 €/ha 15-30 ha * 30 €/ha	0-30 ha * 50 €/ha 30-46 ha * 30 €/ha
Young farmers		≤90 ha *50 €/ha [< 40 years old]	→
Grassland LFA		ha permanent grassland * 40 €/ha	4.5 % of P-I budget → P-II implementation of measures
		Grazing LU * 80 €	by Länder

*) Allowing production of food, non-food and feed (grazing livestock) on ecological focus areas.

Source: Own elaboration.

In the **AMK proposal,** additional payments for the first hectares were 50 €/ha up to 15 hectares and 30 €/ha for areas between 15 and 30 hectares. The young farmers' scheme will give a premium of 50 €/ha up to 90 hectares for

farmers less than 40 years old. A premium of 40 €/ha will be paid for Grassland on less favoured, mountain areas and islands; eligible regions are determined based on existing LFA categories. Grazing livestock on mountain areas will get a premium of 80 € / grazing LU (livestock units).

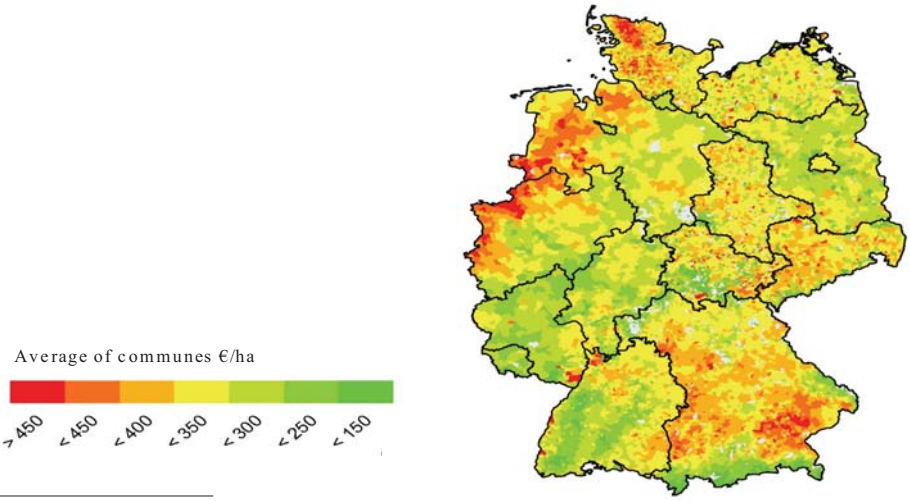
In the **AMK agreement** of November 2013, premia for the first hectares will be enlarged as 50 €/ha for the first hectares and 30 €/ha for 30-46 hectares. The young farmers' proposal is maintained. Due to significant regional redistribution effects, the grassland and grazing livestock measures are skipped. Instead, 4.5% of the budget will be transferred to Pillar-II; the referring measures will be determined at Länder level.

In the following, partial effects of these measures on payment levels as well as income effects are analysed referring to the reference situation.

2.3. Excursus: Effects of regional implementation of the Single Farm Payment Scheme (SPS) in Germany since 2005[7]

In Germany the SPS was implemented as a dynamic hybrid model combining area-based entitlements and farm individual top ups, being stepwise harmonized at the Länder level until 2013. Also, a regional equilibration of premium volume is carried out between the Länder, changing the former Länder budget by -5 to +14%.

Figure 1. Regional entitlements levels in 2005



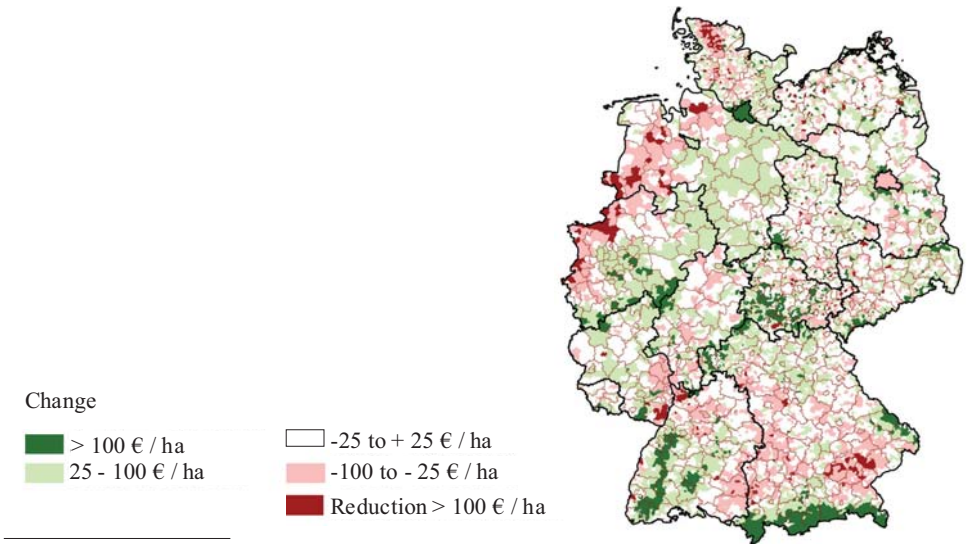
Source: Salhofer et al (2009).

[7] This chapter is based on the paper 'Impacts of SPS implementation options on the distribution of support', presented at the OECD Workshop on the Disaggregated Impacts of CAP Reforms Paris, 10-11 March 2010.

The development of entitlements at the municipal levels in 2005 is shown in Figure 1 (Salhofer et al., 2009). Premium levels of less than 150 €/ha are to be ascertained in the low mountainous areas in the west and the south as well as in the pre-alpine area of Bavaria, which goes back to high shares of grassland and low livestock densities. Wide areas with high shares of arable land show a level of payment claims of 250 to 350 €/ha. The highest level of the payment claims of 450 €/ha and more are in areas with high concentration the bull fattening and milk production (the north, north-west and to southeast). Red spots in Eastern Germany point to the fact that specialised beef and milk production is often concentrated in large farms whose surface area can reach the area of a municipality.

Figure 2 shows the changes of payment claims due to the full transformation into the regional model in 2013. Premium increases of more than 100 €/ha are to be expected in mountainous regions. This can be traced back to the upgrading of the level of the payment claims for grassland. On the other hand, premium losses of more than 100 €/ha appear in areas with a high concentration of bull fattening and milk production (northwest and south). In wide areas no significant premium changes are to be expected. Nevertheless, it was found that the direct payments are redistributed above all to the disadvantage of farms with intensive beef and or milk production. Extensive cattle farms and farms located in less favoured areas are gaining.

Figure 2. Change of entitlement levels until 2013

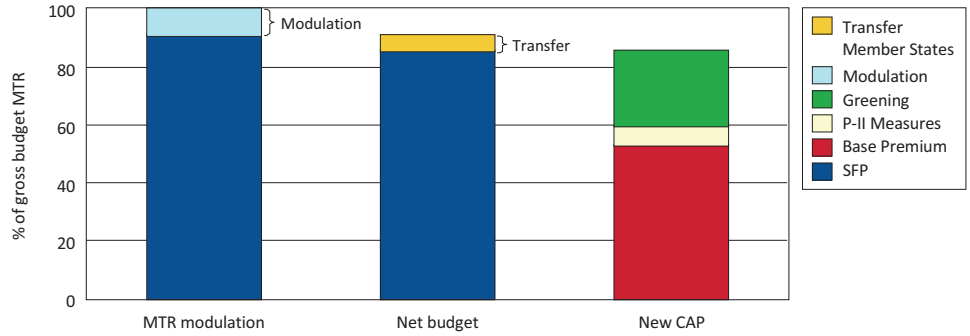


Source: Salhofer et al (2009).

Partial effects of New CAP on Pillar-I payments

The development of Pillar-I payments relative to the total in the reference is shown in Figure 3. In the existing CAP about 8% of gross budget is transferred to Pillar-II. Within the New CAP a further 4% is transferred to other Member States aiming at a better harmonisation of premium levels. The remaining net budget is about 85% of the former gross budget; this will be split into 30% for greening payment, about 7% for Pillar-II measures and the remaining as base premium.

Figure 3. From gross budget (MTR) towards net budget (New CAP) – 1st Pillar



Kleinhanss (2013), BMELV-Testbetriebe.

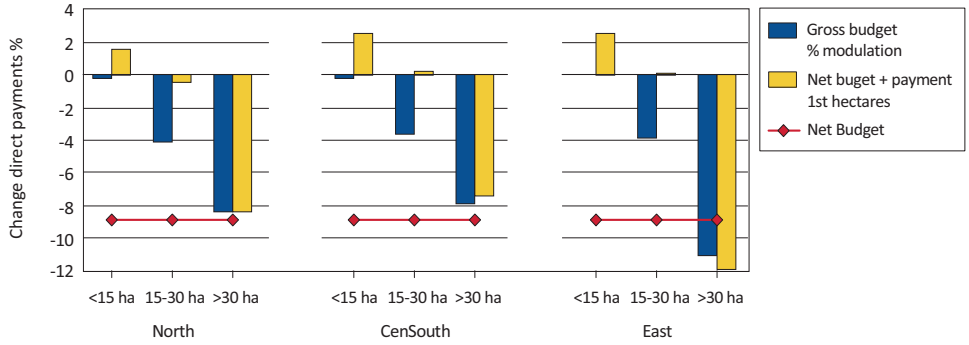
Payments for the first hectares should compensate for advantages of small farms in the former modulation scheme. Application is optional against a degression scheme of 5% premium reduction for farms with more than 150,000 € of direct payments. Although labour costs can be deducted from the underlying direct payments, each measure of degression or capping is opposite to agricultural policy objectives especially in Eastern Germany. In Figure 4 the past and new schemes are compared for three size classes and three regions[8].

With Modulation under existing CAP, the gross payment level of farms with up to 15 hectares is not affected, those of farms with 15 to 30 hectares is reduced by roughly 4%, while those of the larger farms is reduced by 8% in the West and 11% in the East, the latter due to additional Modulation of 4% for DP's > 300,000 €. The switch from gross budget to a net budget would induce a reduction of payments received by 9% for all farms, meaning that large farms would be in a better position compared to present CAP. Premiums for the 1st hectares referring to the AMK proposal would induce a rather moderate higher premium of 2% for small farms, with no effects on farms with 15-30 hectares,

[8] CenSouth: HE, RP, SRL, BW, BY; North:(SH, HH, NI, NRW; East: BB, MV, SN, ST, TH.

but a reduction of premiums similar to Modulation in the West and 1% more (12%) in larger farms in the East.

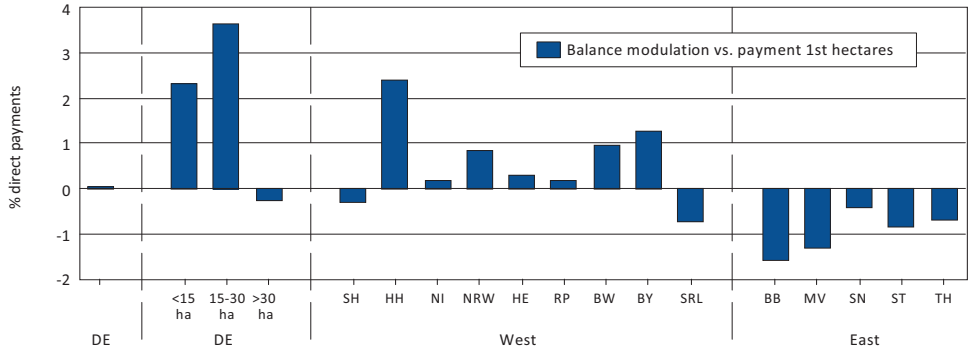
Figure 4. Balance DP Gross (-Modulation) to Net Budget and compensation via Payments for 1st hectares



Kleinhanss (2013), BMELV-Testbetriebe.

The balance of budget over the former and new scheme in Figure 5 includes the withdrawal of budget in favour of this measure at the Länder[9] level; it considers the net effects of the Modulation and the new scheme. In the western part of the country, Schleswig-Holstein and Saarland will be negatively affected, Hamburg, Baden-Württemberg and Bayern will have an upgrade of 2 and 1%, respectively, and of about 0.5% upgrade in the other Länder. All Länder in the East will be negatively affected by -0.5% in Sachsen and up to -1.5% in Brandenburg.

Figure 5. Balance gross vs. net budget incl. payments 1st hectares, by size/Länder



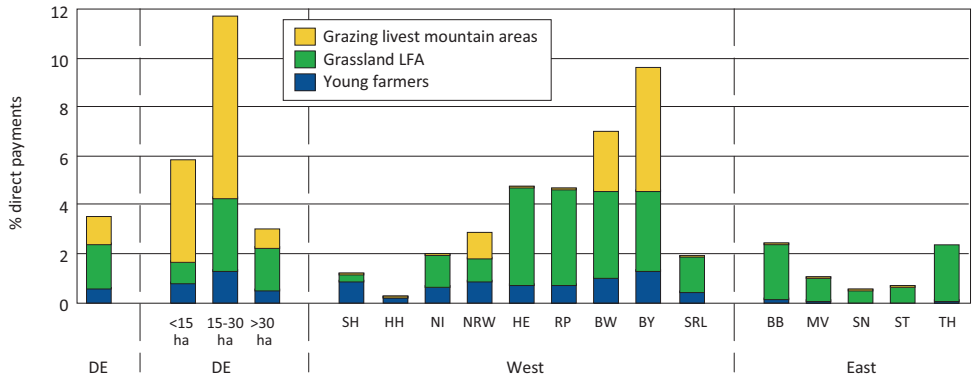
Kleinhanss (2013), BMELV-Testbetriebe.

[9] SH: Schleswig-Holstein; HH: Hamburg; NI: Niedersachsen; NRW: Nordrhein-Westfalen; HE: Hessen; RP: Rheinland-Pfalz; BW: Baden-Württemberg; BY: Bayern; SRL: Saarland; BB: Brandenburg; MV: Mecklenburg-Vorpommern; SN: Sachsen; ST: Sachsen-Anhalt; TH: Thüringen.

Partial effects of the 3 other measures are summarized by Länder in Figure 6. The **young farmers' scheme** is more important in the Western due to the dominance of small and medium sized farms. The average premiums increase by roughly 0.5%, while in the eastern part effects are insignificant. Top up premiums for **Grassland on LFA** will induce an increase on premiums by 4% in Hessen, Rheinland-Pfalz, Baden-Württemberg and Bayern, but of only 1% in the North and Saarland; in the East premiums increase by 0.5 to 2.5%.

Grazing Livestock premiums on mountain areas would increase premiums by 5% in Bavaria, by 2.5% in Baden-Württemberg and 1% in Nordrhein-Westfalen; it has no effects in the Länder in the East. It can be summarized, that the 3 measures would have rather significant redistribution effects between the Länder. As the Länder objectives were to avoid further regional redistribution effects, they decided a global budget transfer of 4.5% to Pillar-II and the use of this budget entirely by Länder specific measures.

Figure 6. Partial effects of measures (young farmers, grassland LFA, grazing animals in mountain areas)

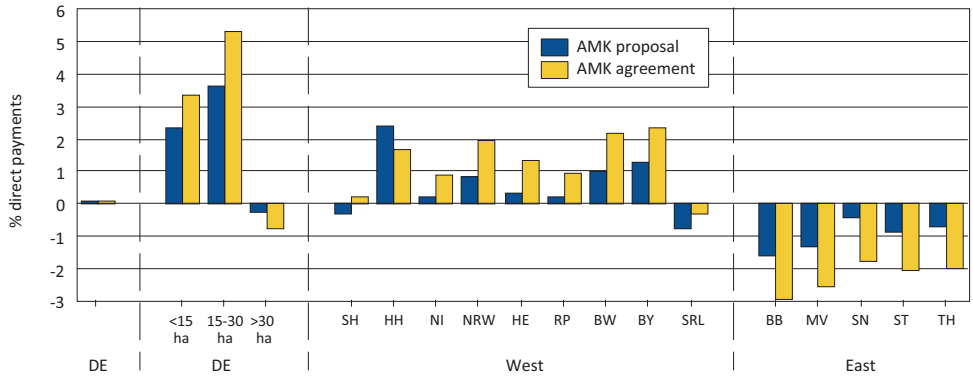


Kleinhanss (2013), BMELV-Testbetriebe.

In the final **AMK agreement the 1st hectare scheme** has been extended in favour of small farms. Figure 7 shows the effects by tree size classes and by Länder, comparing the proposal and final agreement; size classes are determined wrt the latter. The balance would be +2 % and 3.5% for size classes < 30 and 30-46 hectares for the proposal, but 3.3 and 5.3% for the final agreement. For larger farms it will be negative of -0.4% under proposal and -0.8% by the agreement. Differences to Figure 5 are mainly determined by the effects of Modulation of the respective size classes. In the West only Saarland will have insignificant premium reductions, while they increased by about 2% in Nordrhein-Westfalen, Baden-Württemberg and Bayern and of about 1% in the others but Hamburg. In the case of Hamburg the premium increase of 1.5% is 0.7%-

points lower than under the AMK proposal, indicating that there is no clear correlation of premium changes with farm size. In the East premiums will be reduced by 1.8 to 3% where Brandenburg, with rather unfavourable soil conditions, would be affected most. Effects of the young farmers' scheme have been shown in Figure 6 and will not be repeated here. Also the global budget transfer to Pillar-II by 4.5 will not be shown.

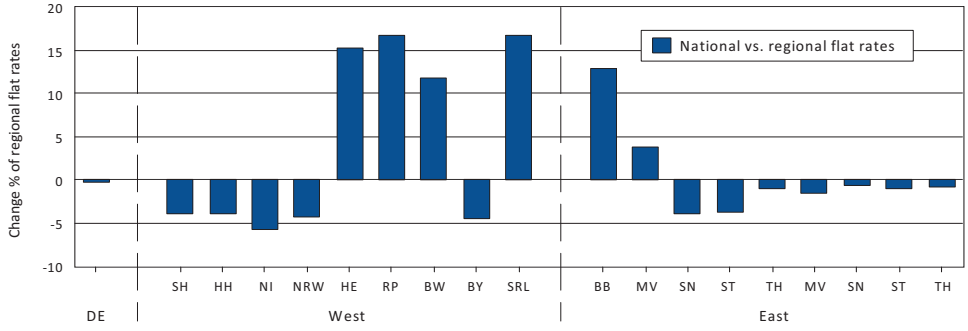
Figure 7. Balance payments 1st hectares - AMK agreement vs. proposal



Kleinhanss (2013), BMELV-Testbetriebe.

Finally the partial effects of national flat rates in 2019 against the former regional ones are shown in Figure 8. Compared to the previous effects, they are significant. In the North premium levels will decrease by 4 to 5.5% and also at the same level in Bavaria. In Baden-Württemberg premiums increase by 12% and of 15-17% in Hessen, Rheinland-Pfalz and Saarland. In the East premiums in Brandenburg will increase by 13%, while in the other Länder with much better soil conditions premiums will either increase less (4% in Mecklenburg-Vorpommern) or decrease by 1% in Thüringen and 3.5% in Sachsen and Sachsen-Anhalt.

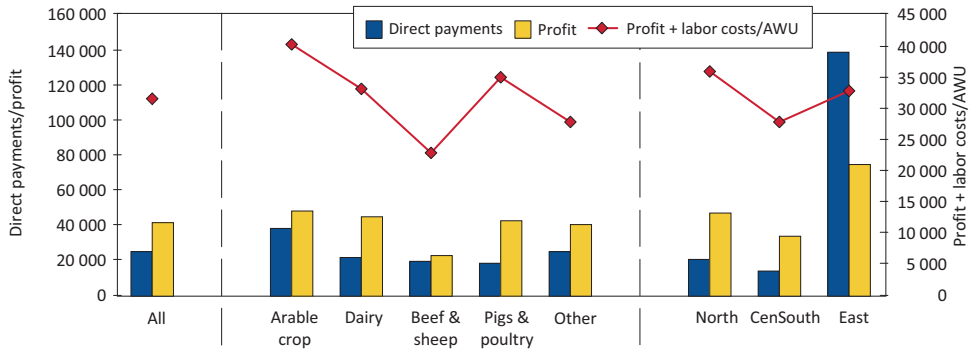
Figure 8. Redistribution national vs. regional flat rates



Kleinhanss (2013), BMELV-Testbetriebe.

Income effects of these measures are only indicative by the underlying approach; instead of predicting incomes until 2019, we take average incomes in the reference as a proxy. In Figure 9 the direct payments and different income indicators are shown for the reference situation by farm types and regions. On average, farms receive about 23,000 € of **direct payments**. For the average of arable cropping farms it is about 40,000 €, and 15,000 to 20,000 € in Dairy, Beef and Pig farms and about 25,000 € in other farm types. It's about 15,000 € in the aggregate of Centre and South (HE, RP, SRL, BW, BY), 20,000 € in the North (SH, HH, NI, NRW), but 140,000 € in the East (BB, MV, SN, ST, TH), due to the dominance of large sized farms organised as Partnerships and Legal Entities. It has to be mentioned that income, expressed by the profit (Farm Net Income) is higher than direct payments on average of farm types and regions in the West. In contrast, it is only half in the East. This indicates that farms in the Eastern part are heavily dependent on direct payments and would be heavily affected by capping or significant degression schemes. However, Farm Net Income is not the appropriate income indicator for comparisons over different legal organisational forms. For that we use profit plus labour cost of salaried workers, divided by the number of agricultural working units. This indicator is shown as a red line and refers to the axis on the right. It is highest of 40,000 € AWU in Arable cropping, only 25,000 €/AWU in Beef farms and about 30,000 € in dairy and other farms. By regions, income is about 35,000 € in the North and East, and about 27,000 €/AWU in the Centre / South.

Figure 9. Direct payments and income indicators by farm type and regions

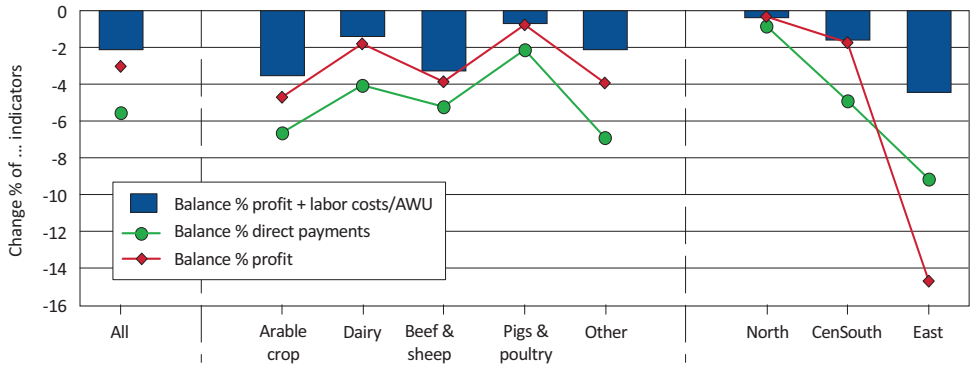


Kleinhanss (2013), BMELV-Testbetriebe.

Relative changes of these indicators are shown in Figure 10. Direct payments will be reduced by 5.5% on average, varying by 2% for Pigs and 7% for Arable cropping and other farms. Payment levels will be 1% lower in the North,

5% in the centre and South and 9% in the East. Effects on profit are closely correlated to direct payments for farm types but of about 2%-points less; with 15% they are significantly negative in the East. Reductions referring to profit plus labour costs / AWU are -2% on average, varying by -1.5 and -3% by farms types and by -0.5% in the North, -1.5% in Centre and South and -4.5% in the East. Finally it can be concluded that income effects are rather moderate.

Figure 10. Effects of measures on direct payments and income (AMK agreement) by farm type and regions



Kleinhanss (2013), BMELV-Testbetriebe.

2.4. Summary and conclusions

The CAP post 2013 was a success in terms of maintaining the budget of public transfers in favour of farmers, but is without clear orientation wrt a more efficient use of public funding and future societal goals, as well as not regarding the changing conditions of agricultural markets. The two years of negotiation ended in a consensus of a bundle of measures going forwards or backwards compared former CAP's and with manifold options of national implementation. Administrative burdens will become more important as previously.

Germany is an example of in-time implementation of the CAP reform measures, and also a leader in implementing principles of decoupling. The move from historical towards regional entitlement levels has been implemented in the previous two reforms, whilst other Member States are obliged to do that under the New CAP, although significant redistribution effects occur.

Although the first hectare premiums are critically discussed by German Economists (top agrar, 2014) there are good reasons to balance the effects between the former and the New CAP between size classes (Kleinhanss, 2012). The Young Framers' scheme has some regional distribution effects, but much

less than would be with the implementation of Grassland and Grazing Livestock premiums on disadvantaged regions. To avoid this, AMK finally decided upon a global Pillar-I budget transfer to Pillar-II and determination on measures entirely under the authority of the Länder.

Finally, the New CAP will have rather moderate negative income effects. Unresolved are the effects of CAP on land rental prices. There are clear indicators that the significant rise of rental prices is influenced by decoupling, especially the transparency coming-in by the regional entitlements. Other factors are the rise of agricultural commodity prices especially for crops, but also the heavy subsidization of bio-energies as biogas and bio-fuels based on national policies.

References

1. Forstner B., Deblitz C., Kleinhanß W., Nieberg H., Offermann F., Röder N., Salamon P., Sanders J., Weingarten P., (2012), *Analyse der Vorschläge der EU-Kommission vom 12. Oktober 2011 zur künftigen Gestaltung der Direktzahlungen im Rahmen der GAP nach 2013. Arbeitsberichte aus der vTI-Agrarökonomie 2012/04*, Braunschweig, http://literatur.ti.bund.de/digbib _exte rnm/bitv/dn050475.pdf.
2. Kleinhanss W., (2012), *Wer soll das bezahlen?: und wer bekommt es? – die Begründung der gemeinsamen Agrarpolitik*, Loccumer Protokolle, Band 05/12, p. 141-151.
3. Salhofer K., Röder N., Kilian D., Henter S., Zirnbauer M., (2009), *Märkte für Zahlungsansprüche (Markets of Entitlements)*. BMELV research contract 05HS041, http://www.leaderplus.de/download/pdf/05HS041.pdf.
4. Top argar, (2014), *Agrarökonomen: Die EU-Agrarpolitik ist ihr Geld nicht wert*. http://www.topagrar.com/news/Home-top-News-Agraroekonomen-Die-EU-Agrarpolitik-ist-ihr-Geld-nicht-wert-1320100.html.

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3. Effects of the new agricultural policy on the specialised agricultural region of Mecklenburg-Western Pomerania (Germany)

3.1. Introduction

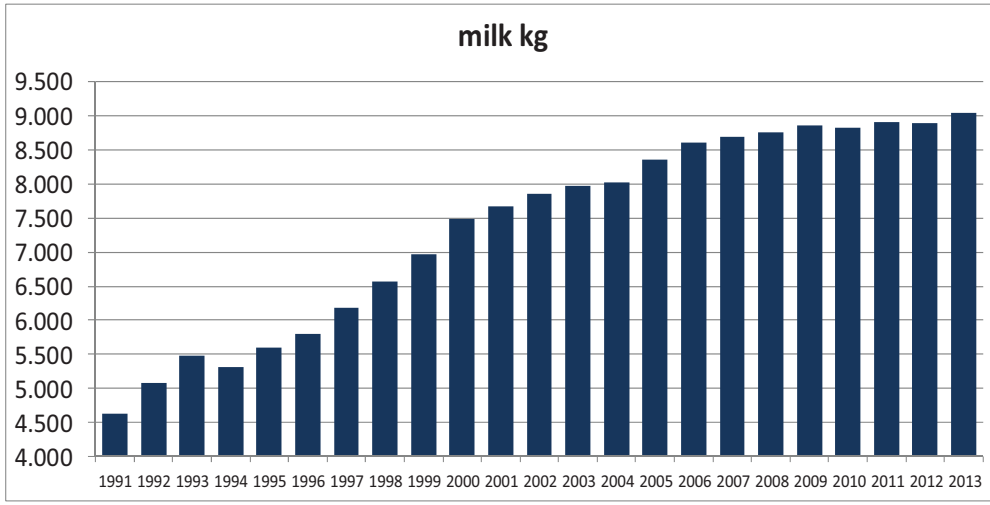
Mecklenburg-Western Pomerania is situated in the North Eastern part of Germany, bordering the Baltic Sea, Poland, Brandenburg and Schleswig--Holstein. The state is influenced by three big regions: Berlin, Hamburg and Szczecin. The State Research Centre for Agriculture and Fishery Mecklenburg--Western Pomerania (LFA) focuses on specific issues and topics of regional interest considering sustainability. The research is generally applied and aims to provide supporting knowledge to agricultural, horticultural and fisheries producers, their associations as well as to political decision makers. They are networked with practitioners, agricultural consultants as well as with other researchers within Mecklenburg-Western Pomerania and abroad. Teaching activities at local universities (Rostock, Berlin) and professional training courses promote additional knowledge transfer and collaboration between institutions. There are four institutes in an organisational structure: Arable farming and economics; Animal production; Fisheries and Horticultural production.

3.2. Aspects of agriculture – long tradition

Agriculture is done with 5,000 farms on 1,078,400 hectares. This leads to 286 hectares per farm. There are mainly grown grain (50.3%), oil seeds (24.5%) and corn (13.1%). It can be found 1.3 workers per 100 hectares utilizable agricultural area. Whereas in Bavaria 4% of farms are bigger than 100 hectares, in Mecklenburg-Western Pomerania (MWP) this amounts to 48%. Considering animal production, dairy farming is the main factor of agricultural income. Milk production is done with 177,000 dairy cows (mainly German Holstein). Average herd size is 270 cows. 50% of cows can be found in herds with 200 to 500 cows. 25% of cows belong to herds with more than 500 cows. There is a tendency of further increasing herds. This is also because higher milk yield could be reached in bigger herds by implementing actual management tools. Successful development of dairy farming in MWP can be seen in figure 1. Between 1991 (4,632 kg

per cow) and 2013 (9,043 kg per cow) an average increase of milk yield per cow and year of 200 kg milk was detected.

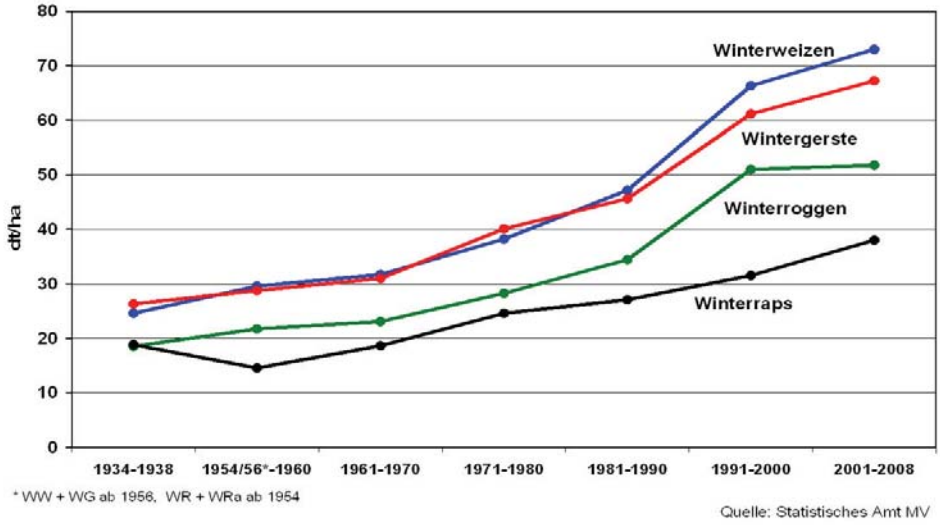
Figure 1. Development of milk yield per cow and year in MWP between 1991 and 2013



Source: Own elaboration.

The importance of beef breeding results from bonding of work forces in rural areas by effective utilization of natural grassland. 200 members are belonging to the breeding association RMV. They work with an average herd size of 300 beef cows. Suckler cow herds are bred with following breeds: Simmental, Charolais, Angus, crosses of Simmental x Charolais. Daily life weight gains of 1,500 g per calf and excellent meat quality are reached. High feed quality in cattle production is secured with silages from grass, corn, alfalfa and clover. Intensive grassland management is necessary to reach good qualities. Corn thereby is of high importance for feeding of cattle as for "feeding" of biogas fermenters. There is even potential for pig production. It belongs on top in Germany. With 846,000 pigs 24 to 25 piglets are weaned per sow and year. Each sow is farrowing 2.4 times per year. On average 12,000 pigs are sold per year and fattening farm. Modern processing capacities (dairies, slaughterhouses, sugar plants, laboratories) are supporting successful development of production. In arable farming there is an efficient development, too (figure 2).

Figure 2. Increase in yields of grain and rape in MWP between 1934 and 2008 (dt per ha)



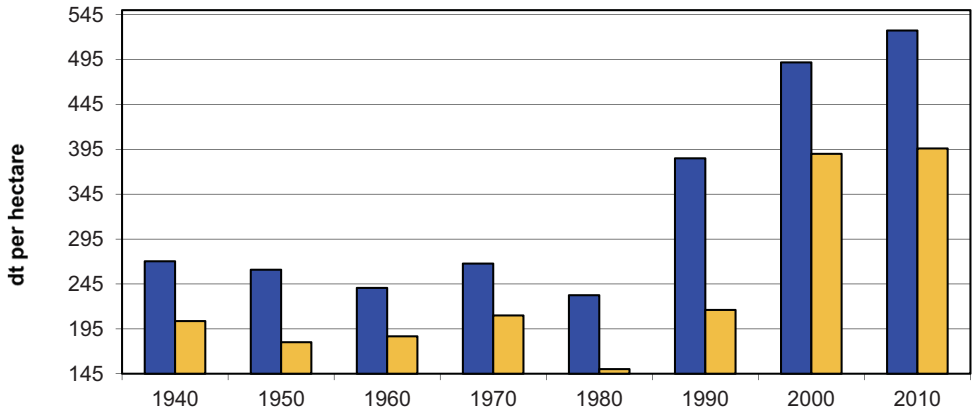
Note 1: Winterweizen (WW) = winter wheat; Wintergerste (WG) = winter barley; Winterroggen (WR) = winter rye; Winterraps (WRa) = winter rape.

Note 2: 1 dt = 100 kilograms

Source: Own elaboration.

There could be seen an enormous increase in yields for sugar beets and potatoes especially since the early nineties (figure 3).

Figure 3. Increase in yields of sugar beets (blue) and potatoes (yellow) in MWP between 1940 and 2010 (dt per ha)



Source: Own elaboration.

3.3. The Common Agricultural Policy – legal proposals

It took a long way to define new proposals and get into constructive discussions. But is there already found the right way into future? There are three big challenges for agriculture: on economic, on environmental and on territorial area. Economic challenges include food security, price variability and threats of economic crisis. Environmental challenges can be found by considering Green House Gas emissions, soil depletion, water and air quality and by exploring habitats and biodiversity. Territorial challenges are touching vitality of rural areas and diversity of EU agriculture. To face challenges legal proposals should aim at considering reform objectives as enhanced competitiveness, improved sustainability and greater effectiveness. Looking at assessing new decisions different assessments in dependence on affected group can be stated. Whereas policy forces mean, decisions are positive and bearable, research institutions in MWP think positive about the continued system of decoupled payments. The farmers union is discussing a loss of 40,000,000 € per year for MWP. This results especially by supporting first hectares (21,000,000 €) and shifting of direct payments from the first to the second pillar.

3.4. Discussion of consequences for the agricultural region of MWP

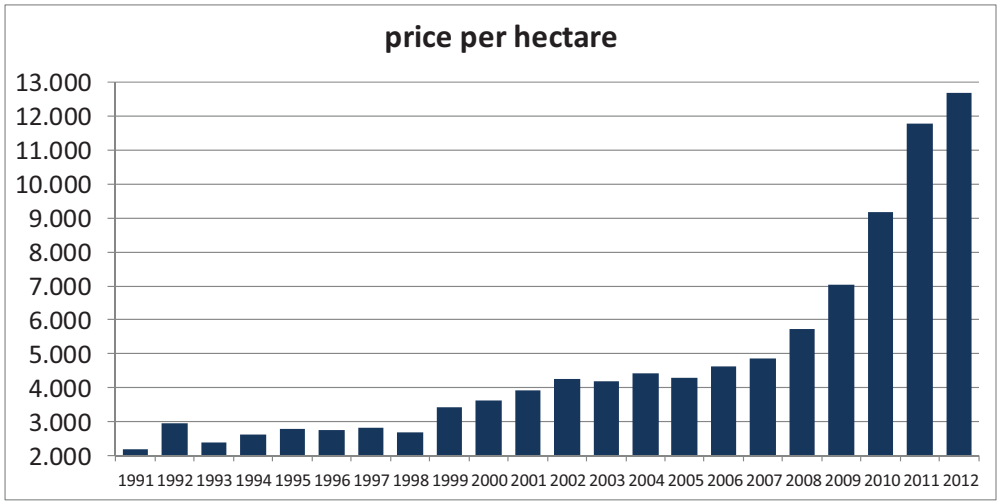
Looking at a loss of 40,000,000 € per year for the agriculture in Mecklenburg-Western Pomerania it should be answered whether an indirect effect of payments from the second pillar ca be reached. It seems as it could be reached by intelligent programmes including research and development, consultation, innovation and stimulation of investments. 40,000,000 € mean if there are 20,000 people dealing with agriculture (4 per farm) that each person is losing 2,000 €. This seems to be quite a lot if one is recognising that the average payment per agricultural worker in MWP is about 25,000 € per year.

Redistribution of direct payments leads to an average payment of 283.25 € per hectare in Germany in the year 2019. For the region of MWP it is calculated to get a 265.13 € per hectare in 2019. Looking at farm size shows that it depends. So farms bigger than 1,000 hectares would get 255 € per hectare whereas farms smaller than 50 hectare would get 295 € per hectare.

Support of young farmers is of high importance because there is already now a lack of engaged well educated and motivated young people willing to work in different fields of agriculture. Because of a small availability of land to ensure an efficient farm size and because of high prices to buy and lease land (figures 4, 5 and 6) it is not to assume that a big number of new enterprises will develop. As to see in figure 4 in MWP there was an increase of land prices of

500 € per hectare per year. If a farmer paid 2,194 € per hectare in 1991 he had to pay 12,675 € per hectare in 2012. This should be seen in connection with the increased number of installed biogas fermenters requiring a big amount of raw material (corn silage) and by that way because of high subsidies for renewable energies in Germany. There was a larger possibility of bigger added value by producing biogas than by producing milk, pork or poultry. On the other hand it should be recognised that in the last two years there was a positive tendency of increasing producer prices (grain, rape seed, even milk) leading to an increase of demand for land.

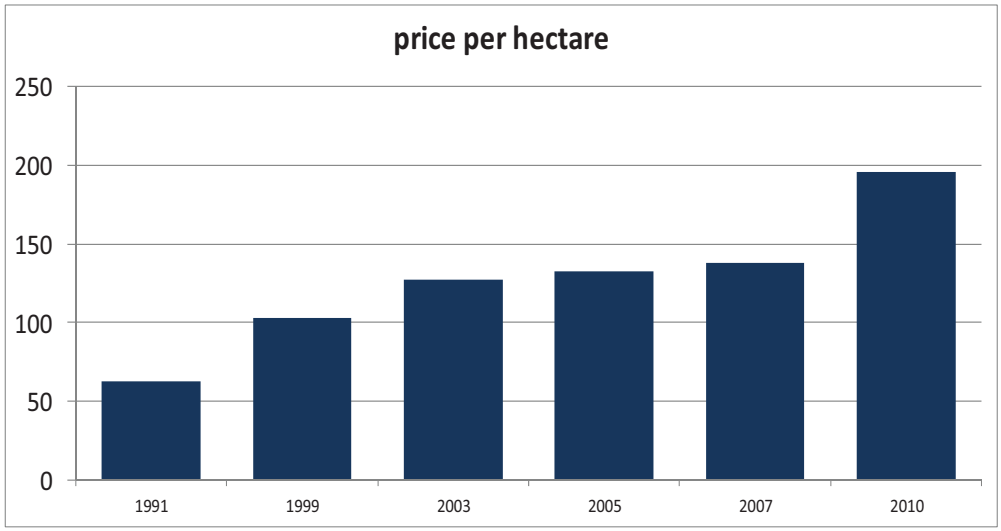
Figure 4. Development of prices to purchase arable land in Mecklenburg-Western Pomerania (€ per hectare) between 1991 and 2012



Source: Own elaboration.

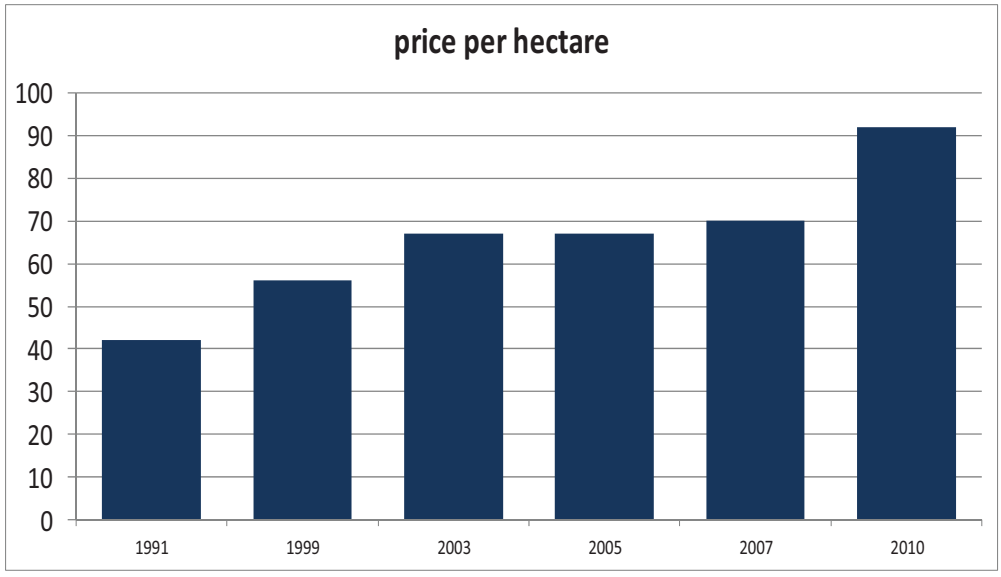
Additionally, prices to lease arable land or natural grassland increased enormously looking at the last years. To lease one hectare of arable land caused costs of 63 € per hectare in 1991 and it caused costs of 196 € per hectare in 2010. For natural grassland prices to lease one hectare more than doubled in between 20 years (1991: 42 €; 2010: 92 €).

Figure 5. Development of prices to lease arable land (€ per hectare) in Mecklenburg-Western Pomerania between 1991 and 2010



Source: Own elaboration.

Figure 6. Development of prices to lease natural grassland (€ per hectare) in Mecklenburg-Western Pomerania between 1991 and 2010



Source: Own elaboration.

3.5. Consequences

It was shown that new proposals of CAP could influence the development of agricultural regions in different parts of Europe in different ways. The specialised region of Mecklenburg-Western Pomerania is losing 40,000,000 € per year resulting to a loss of 2,000 € per person dealing with agriculture. Intelligent programs including research, consultation and innovation could help to overcome a loss of direct payments. Discussions about CAP should start again right now. Especially an open debate about future of direct payments after 2019 is to be initiated. It should be stated that much more administration for less areas could lead into a dead-end-street. Direct payments have to be directed to farmers and not to land owners. Answers should be found for asking which payments and supports do farms in future really need to enhance international competitiveness without accelerating structural changes.

References

1. Deutscher Bauernverband, (2012), *Situationsbericht 2012/13. Trends und Fakten zur Landwirtschaft.*
2. StatA MV, (2012), *Statistische Berichte, Bodennutzung und Ernte in Mecklenburg-Vorpommern 2012*, Statistisches Amt MV, http://service.mvnet.de/statmv/daten_stam_berichte/e-bibointerth05/landwirtschaft/c-i_/c103_/daten/c103-2012-00.pdf.

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4. The new CAP and competitiveness of agricultural enterprises and the food industry

4.1. Introduction

In order to discuss the effect of the new CRP on the global food economy, and thus on the competitiveness of agricultural enterprises and the food industry, it should be pointed out that negotiations on the reform of CAP have come to an end. From the perspective of the future new CAP, the following picture emerges:

- the policy of public authorities has significantly changed. For 10 years, the state has been gradually withdrawing from interference in the markets;
- increase in the demand for agricultural products exceeding the supply on the global scale causes tension on the markets in all sectors of production. Globalisation of the economy makes the markets more and more connected and dependent on each other. One can note some instability of agricultural markets;
- a direct consequence of these phenomena is the start of the period – certainly a long one – of the stability of prices of raw materials. Such uncertainty results both from high variability of exchange rates, but also from increased unpredictability of the markets. Of course, this translates into the volatility of income;
- the problem involving the risks connected with weather anomalies or climate change is on the increase, which will be particularly severe for the agri-food economy;
- it should also be kept in mind that this reform defines three most important goals;
- the use of the competitiveness of all European agricultural holdings to ensure food safety;
- development of underpinnings of a new long-term competitiveness, both economic and ecological one;
- ensuring the functioning of agriculture in all regions in the EU.

It means that three priorities emerge for agriculture: competitiveness, increase in and sustainability in the long-term perspective. However, it should be pointed out that, at the same time, the European budget for 2014-2020 has allocated an amount smaller by 11% for the implementation of the above mentioned goals in the agriculture, as compared to the previous budget, with a fixed exchange rate for Euro, and direct payments decreased by 17% (Table 1).

Table 1. Changes in the EU budget after the introduction of CAP 2014-2020

Changes in the EU budget after the introduction of new CAP			
Specification	Current situation in 2007–2013 (EUR million)	Ultimate budget in 2014-2020 (EUR million)	The difference in the current/ultimate budget (EUR million)
Competitiveness, increase, employment	91 940	125 614	+ 38%
Agriculture	420 682	373 179	- 11 %
including Direct subsidies	336 685	277 851	- 17 %
including Development of agricultural areas		84916	
including Emergency reserve		2 800	

Source: Prepared by the author on the basis of data of the European Commission, ec.europ.eu.

The European agreement of 26 June 2013 on the reform of CAP allocates support for cohesion between Member States and between farmers in individual countries. It also makes it possible to grant special support for "sensitive" productions and promotion of exchange of generations.

4.2. Implementation of CAP 2014-2020 in France

Agriculture and food industry in France are the strategic sectors in terms of creating wealth, jobs and trade. Agriculture covers 750,000 Annual Work Units (AWU: the owners of farms, family members, permanent and temporary employees). The agri-food sector occupies the first place among the French industrial sectors, generating over 450,000 jobs and over 12,000 enterprises, which produce a surplus in trade amounting to EUR 12 billion in trade. In this context, the implementation of the reform of CAP in France involves the tasks and challenges of great importance, which are to lead to reaching greater justice and make it possible to maintain the highest possible number of jobs and to sup-

port the diversity of agricultural holdings, not only those that were the largest beneficiaries.

The new CAP can be compared to a box for tools that are used depending on the situation. It features the following:

- internal consolidation (convergence), which means departure from previous subsidies. It provides an opportunity to implement a partial standardisation specified by State Member under some minimum conditions;
- payments for agricultural practice beneficial for climate and the environment ("greening") they include 30% of the budget of direct subsidies; in order to receive them, three criteria should be met: diversification of crops, maintenance of permanent grasslands, maintenance of environmentally friendly areas;
- redistribution payment, which consists in allocation of up to 30% of the national envelope for additional payment for the same number of the first hectares;
- partial payments, which are coupled again; there is a possibility of granting coupled payment to some selected industries. One may to allocate up to 13% of national envelopes to direct payments + 2% for protein crops (legumes);
- payment to young farmers; it is a mandatory measure, for which up to 2% of the national envelope will be able to be allocated. They are added to the payments from the second pillar;
- the support to areas facing natural constraints, whose introduction is not mandatory.

The present situation in the French agriculture requires some changes under the CAP. The current subsidies are based on the historical data that date back to the first great reform of 1992 which, on the other hand, were prepared on the basis of the previous profitability levels. These payments were compensating premiums against decreases in official prices. The reforms of 1999 and 2003 made it possible to maintain this historical nature of payments and such a choice was made by France. This results in a deep disharmony and inconsistency with regard to payments received by the farmers in various regions sectors of production and farms. Situated in the north and in the south of France, in flatlands and in the mountains or between large-area farms and breeding farms. Farms with a lower potential in terms of their profitability receive lower assistance, which results in double punishing.

Recent reforms, which have been introduced since 2000, on top of decoupling the payments introduced in 2006, as well as gradual departure from control

of market tools, have confronted the farmers directly with the market. They participate in the transition from public risk management to private management.

The abolition of milk quotas, announced for March 2015 and sugar quotas, in October 2017, along with the related rights under the delivery of beets, only emphasise this trend. They should be replaced by conclusion of contracts between a farm and an agri-food enterprise.

In addition, the economic context of the recent years, stimulating plant production, has increased the disproportion of income to the incurred workload in the family agriculture with a ratio of 1 to 3 between plant production and animal production, whereas the working time in the case of animal production is two times higher.

This results in an increased orientation towards plant production in the farms at the expense of animal production even in the regions that are perfect for animal breeding, where co-operation with the agri-food industry has been developed over the past thirty years. Meanwhile, the breeding sector with processing enterprises contributes to maintenance, and even creation of new jobs and added value.

Unfortunately, the current changes (abolition of payments of production refunds, competitiveness of tools) make some agri-food companies face financial difficulties despite the taken restructuring activities.

It should be pointed out that one of the first challenges in this area will be the exchange of generations since the average age of the people running breeding farms is 48.4. Furthermore, high prices of cereals make animal breeding hardly attractive. Throughout the entire territory, many breeders sell the animals when they have sufficient acreage in order to focus on plant production only. The agricultural census that took place in 2010 showed that in 2000-2010 (the period when one fourth of the farms ceased to exist), the sector of animal husbandry and multi-area production with breeding has been affected to the highest degree. At that time, the number of producers of cereals almost did not change. In the subsequent years, it has been noticed that the tendency to retrain for cultivation of cereals intensified even more.

4.3. Development trends for CAP 2014-2020 in France

In the macroeconomic context, characterized by a substantial difference between animal production and plant production, many people think that the future reform of the Common Agricultural Policy must be an opportunity to conduct budget support shifts from huge-area farms to breeding farms. Such an attitude is strengthened by the fact that high volatility of agricultural prices in the last five years has weakened the presently applicable tool for direct coupled

support. Actually, they are granted to farmers regardless of the achieved prices and are always determined on the basis of historical reference prices.

Decisions referring to CAP after 2015 and taken in June 2013 offer each Member State of the European Union (EU) some action lines in order to go precisely in that particular direction.

Support granted directly to farmers who under the impact of subsequent reforms and gradual reduction in the official prices compensated by direct coupled subsidies (established in 2006), currently represents almost two-thirds of the total public support for agriculture.

Given the significant restructuring of that sector (reduction in the number of workers), the average amount of direct support per farm and per workplace grows constantly. Such an upwards trend may continue until 2020 as the restructuring rate of the farms exceeds the budgetary income reduction rate.

In connection with the political agreement of 26 June 2013, France opted for the possibility of making choices (still undefined), which were assumed to balance the sector of animal husbandry in relation to plant production. On 2 October 2013, the president has presented the main priorities by means of which France will implement the CAP reform:

- Support for animal husbandry,
- Support for the breeders within sensitive areas,
- Support for modernization of farms and infrastructure,
- Reporting on the ecological transformations,
- Better distribution of support.

This means standardisation of support, but also a sort of operational philosophy: "enhancing the competitiveness of the weakest without exposing the operation continuity of the strongest": New CAP is to lead to:

- Gradual standardisation, starting from 2015 in order to achieve 70% in 2019; Standardisation at the national level because operations at the regional level are not sufficiently redistributive.
- Payment for agricultural practices beneficial for climate and the environment will be used not on the lump sum basis, but individually and in proportion to basic support.
- In order to protect the system, a mechanism limiting losses will be used for a single farm incurred in relation to harmonisation of the law with basic payments in relation to the initial value. The maximum level of losses is defined at 30%.
- The redistribution payment to support activities and employment in farms. This mechanism involves an additional payment to the first 52 hectares, which is to increase gradually from 2015 on to reach 20% of assistance in

2018 with an assessment made in the middle of this period. The payment will be particularly valuable for breeders of animals because it is an economic approach rather than a social one. The goal is not to support the farms that do not have an appropriate size. This support for certain types of farms that are particularly useful for the country and the ones that can achieve a high level of economic competitiveness. This is an economic choice. The assumed increase will make it possible to alleviate the effects of standardization for some farms, in particular the ones specialized in milk production and fattening.

- Inclusion of shareholders when using transparency only to agricultural groups for common operation of agricultural business (GAEC).

4.4. Priorities of the new CAP

The EU has prioritised the following under CAP:

1. *Support for animal husbandry*

For the first time since 2003 a possibility has appeared to increase the share of coupled payments. The achieved freedom will be fully used for 13% of the national envelope of direct payments.

The current/budget for coupled support of breeding will be maintained both as a premium for a suckler cow, a premium for beef, a premium for goat meat, assistance for mountain milk or veal under a brand. On the other hand, allocation conditions will be changed for so as to break free from the logic of historical references in favour of actually produced quantities. This is exactly the concept of coupled support.

The plans also include a premium for milk cows and an extra payment for fattening, which are to encourage production of added value. These premiums will be introduced in order to encourage indexation of products within territories, to strengthen abattoirs, co-operatives and industries.

2. *Support for sensitive sectors of plant production (durum wheat, some preserved vegetables*

In order to reduce the dependencies of French farms on import of plant protein, the government decided to allocate 2% of national envelope of direct payments to encourage domestic production of leguminous plants and hence to increase independent deliveries of feed to farms.

3. Assistance to "sensitive" areas

Support to farmers, in particular the breeders, in the less-favoured areas. Compensatory allowance for permanent natural constraints (ICHN) will undergo the first revitalisation in 2014 up to 15% in all areas (mountains, foothills or less-favoured areas).

The agri-environmental grassland premium (PHAE) will be simplified under ICHN). Shifts will take place during the resumption of contracts in connection with the new programming of the Rural Development Fund, i.e. in 2015. In addition, the ceiling for the ICHN allowance will be raised to 75%. The profits will be transferred to milk producers within the less favoured areas and forelands.

Breeding on pastures that can be found in other regions will be able to use IEA funds (agri-environmental measures of assistance) appropriate for their production systems. Altogether, even 85,000 farmers will benefit from the reform.

ICHM allowance will be re-adjusted with EUR 300 million to reach the annual budget at the end of the period in the amount of EUR 1.1 billion. It should be pointed out that 40 years after establishing the special mountain subsidies, the largest so far implemented increase takes place at the moment.

4. *Support for modernization of farms by means of various kinds of financial support*

The future of agriculture is formed first of all by young farmers. The goal is to provide support to at least 6,000 farms where young farmers begin their business. As a result, a new tool is planned to support young farmers in an amount of 2% of the national envelope of direct payments, which gives EUR 100 million each year from the first and the second pillar.

The future is also formed by the measures protecting against the effects of climate, sanitary, environmental and economic risk. Therefore, the tools for prevention of hazards and risk management will be revised.

The new plan of competitiveness and adjustment of farms applies in the first instance to breeding buildings. This plan will have at its disposal a modernization fund amounting to EUR 200 million for animal breeding, involving in particular the state and the European Union.

5. *Support for environmental changes*

The measures in the field of environmental protection will be increased, and the loans provided for in the next programming period will be doubled (doubling the loans for the funds in the agri-environmental field). The programme "ambition bio" of the ministry of agriculture is to double the financial support for doubling the areas.

4.5. Conclusions

All the changes, including CAP changes, lead to the emergence of groups that will benefit from them and the groups that will lose. Small agricultural holdings will be among the farmers who will benefit from increased assistance. The goal of support to these farms will be to restore the equilibrium with a view to strengthening their competitiveness, and otherwise they would have to be liqui-

dated. Losers will include the farms involved in large-area and versatile farming and intensive breeding. In those farms, within five years, the reduction of assistance will amount to 20-50% (in individual cases). Thus, there is an urgent need to make it possible for these holdings to adapt to new conditions because they took into consideration the level of support in pilot activities and plans of their farms. Now they must treat this assistance in a different way: as support of income, but also as assistance in the future adaptation to the amended context.

There are the tools encouraging the transfer of budget support in favour of cattle breeding, for example by more intensive implementation of the principle of subsidiarity. It will be very difficult to reach a political arrangement due to contradictory interests of individual regions (flatlands versus mountains) and agricultural industries.

The complexity of the matter is additionally emphasised by the dominance of one system of animal husbandry over another. (France is a country that produces 360 types of cheese!). Extensive cattle breeding farms are able to cope with it, but the situation is worse for more intensive breeding farms.

After a long period when decoupled payments were preferred, the future CAP admits for the first time an increase in coupled subsidies (from ca. 10% to 15% in the case of France) first for all in favour of the sector of cattle breeding. Such a change of the direction is of great symbolic importance even if system of decoupled payments will still occupy an important place in the entire system. Decoupled direct subsidies do not contribute to stabilization of breeding activity exposed to the threat of instability in flatlands; in addition, they are not an appropriate instrument to support the less favoured areas, even if direct subsidies from agricultural development (e.g. ICHN) have a positive impact on the supply;

Maintenance or development of production of cattle will not depend only on the method of allocation of support. Efforts must be taken at many levels: instruments for regulation of markets in the context of increasing price volatility, industrial and commercial organizations in the sectors and industries, position on the markets.

Support for activities in agriculture throughout the entire territory of the state as a carrier of support for other types of operations: the agri-food industry, tourism in diverse French regions. Actually, the effects will detectable at workplaces in the whole country. This is to some extent a policy of spatial planning and regional development.

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5. Structural change in livestock sector as challenge for the new CAP: Lithuanian case

Presently, the EU agriculture faces new challenges conditioned by growing consumption of livestock products, animal welfare restrictions, climate change and resource constraints. The livestock sector is critical for rural vitality as it ensures farmers' income diversification and contributes to rural employment. However, the ratio of holdings with livestock to the total number of holdings has decreased in more than 80 percent of the EU members during the previous five years. These changes were presupposed by the directions of the current Common Agricultural Policy (hereinafter referred to as the CAP). The legal proposals for the CAP reform provide new measures for managing the structural changes in agriculture. The present paper analyzes the relevance of the tools of the proposed new model for the CAP direct payments focusing on the peculiarities of the strategy adopted by the Lithuanian livestock sector. The research estimates the amount of financial support required to improve the existing situation in the Lithuanian livestock sector. The diversity of the relevant CAP tools and distribution solutions are presented in the paper.

5.1. Introduction

The consumption of animal protein is on the rise all over the world. The consumption of meat has increased from 44 million tons in 1950 to 284 million tons in 2009, more than doubling the annual consumption per capita and reaching over 40 kilograms. The rise in the consumption of milk and eggs is equally dramatic. Wherever incomes rise, so does meat consumption [Earth... 2011]. Experts predict that the worldwide consumption of pork, beef, poultry and other livestock will have doubled by 2020 due to the increased per capita global consumption of meat and the growth of population. Most of this increase in production will come through industrialized animal production systems [Brooks 2007].

Livestock farming has a significant effect on rural communities and their vitality. Animal production systems need to fit within the values of the rural communities if they are to be accepted. Economically, livestock contributes to the economic growth and vitality of the community. By further developing this sector, farming could still be preserved even in the less favored areas which result in a lower added value of crop cultivation. Livestock production systems

create jobs on the farm, at local businesses, and in the community, as well as helping to keep the population stable, which supports local social institutions such as churches and schools [Hogberg *et al* 2005, Melnikienė 2011].

Enforced as of 2004, the CAP became a significant challenge to the EU members in terms of keeping up the vitality of the livestock sector. The goal of the applied policy was opposite to the worldwide increase of livestock product demand: the EU implemented a production extensification policy in the livestock sector with the aim to compel the farmers to take the market signals into higher regard than the allocation of financial support. The said goal was difficult to reach; however, it had a huge impact on the contraction of the livestock sector within the entire EU and especially in such countries as Lithuania, Romania and Malta.

The goal of the article is to determine the need of financing from the CAP direct payment scheme during 2014-2020 when solving the problems of the contraction of the Lithuanian livestock sector.

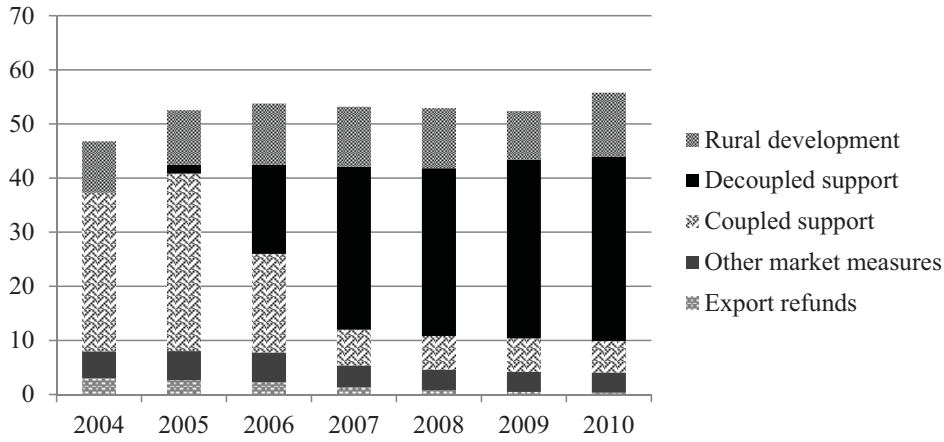
The following methods are employed in the article: comparative analysis, statistical data analysis and optimization methods.

5.2. Impact of CAP direct payments on livestock farming in the EU members

In 2003, the European Commission approved a further major reform of the CAP based on the decoupling of direct payments (European..., 2003). The decoupling broke the link between the production of a specific agricultural commodity and the receipt of direct payments. As of January 1, 2005, eligible farmers have started receiving one payment rather than several separate production-based payments, which denoted the commencement of transferring to the system of decoupled direct payments [Gay *et al* 2005] (Figure 1).

The decoupling of direct payments is expected to increase the flexibility of farmers' decision making, as they are no longer forced to cultivate a specific crop to receive a specific payment, contribute to environmental protection and biodiversity conservation [Viaggi *et al*, 2010]. However, according to Gay *et al*. (2005), for biodiversity objectives decoupling not only opened the chance of greater extensification of land use, but also contributed to the possible disappearance of livestock and thus the threat of land abandonment and a decrease in the area of extensive pasture. A decreasing number of livestock in marginal areas due to decoupling led to the need to support livestock more actively through other measures in order to maintain those farming systems.

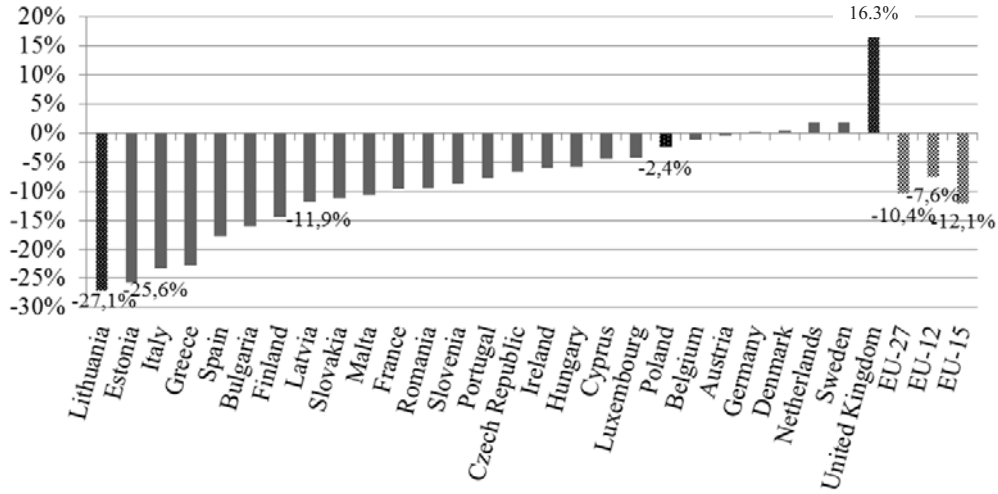
Figure 1. The path of CAP expenditure 2004-2010,
billions of EUR (current prices)



Source: Modified from the European Commission (2012), 2013.

The process of decoupling of direct payments results influenced the contraction of the livestock sector in the EU members and the occurrence of more pronounced structural changes in the direction of crop cultivation. In the period from 2005 to 2010, the change in the ratio of holdings with livestock to total number of holdings has decreased in more than 80 percent of the EU members (Fig. 2).

Figure 2. The change in the ratio of the total number of holdings to the number of holdings with livestock in 2010 compared to 2005

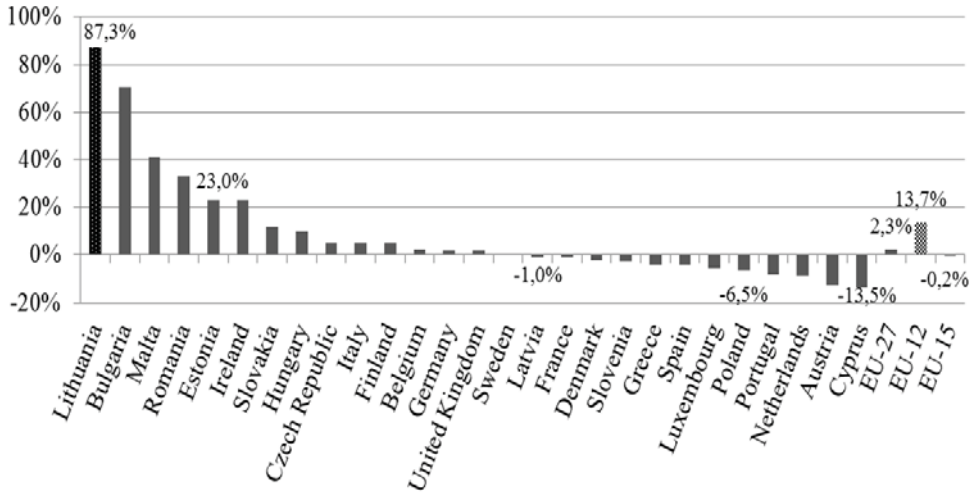


Source: Calculated by the author based on the data of Eurostat, 2013.

The change in the ratio[10] of the holdings raising livestock in the EU-27 in 2010 in terms of all holdings decreased by approximately 10.4% in comparison with the data of 2005. A more significant decrease of the change, around 12.1%, was noticed in the older members of the EU, whereas in the new members it was around 7.6%. This means that the number of all the holdings in the Community was decreasing at a slower pace compared to the number of the holdings raising livestock. The said ratio decreased most notably in Lithuania during 2005-2010 and hit the low mark of 27.1%.

Despite the fact that the number of holdings raising livestock underwent rapid decline in the entire Community, the Eurostat data revealed that the stocking density remained stable with a slight increase in the EU-15 in 2010 compared to 2005 (the utilized agricultural area (hereinafter referred to as the UAA) per head of cattle had an average decrease of 0.2% during the said period). Meanwhile, the stocking density diminished considerably in the new EU members: the UAA per head had an average increase of 13.7% during the said period (Figure 3).

Figure 3. The change in the UAA per cattle in 2010 compared to 2005



Source: Formatted by LIAE according to Eurostat, 2013.

[10] In this case *ratio* is employed because the general tendency of the number of holdings to decrease in the EU members is obvious. However, it is important to focus on the contraction of the livestock sector by assessing the entire agricultural structure both in the EU-27 and Lithuania during the period of 2005-2010.

The stocking density decreased the most[11] in Lithuania during 2005-2010. The UAA per head of cattle escalated to as many as 87.3% in 2010 in comparison with 2005 or by 107% in 2012 in comparison with 2005. Even though the new members of the EU had a six times larger decrease of stocking density compared to the older members, the decline of head of cattle was not noticed in all countries of the EU-12. The most significant increase of the number of cattle during 2005-2010 (among the new EU members) occurred in Latvia (approximately 7%), Poland (approximately 5%) and Slovenia (approximately 2%).

In addition to the cattle production, sheep farming is also rather popular in the Community. However, the results of Lithuania in this agricultural sector are also of notable nature. According to the Eurostat data, the speed of sheep rearing in Lithuania was among the highest ones in the entire Europe during the period of 2005-2010, yet, the ratio of sheep per 1 ha of UAA is the lowest, i.e. 0.02 head/ha, and equal to the ratio in Poland (the average of the EU-27 is 0.55 head per 1 ha of UAA).

Based on the performed review it was concluded that all the EU members were faced with the contraction of the livestock sector and expansion of the crop cultivation sector after the year 2005. However, the largest impact of the contraction of the said sector was noticed in Lithuania, Romania and Malta.

5.3. Impact of direct payments on the livestock sector during 2000-2012: Lithuanian case

To determine the relation between the tendencies of the direct payment (hereinafter referred to as the DP) policy and the development of the livestock sector in Lithuania financed by direct payments, the number of farm animals in the livestock sector was recalculated in livestock units (hereinafter referred to as the LU) for the period of 2000-2012. This calculation was aimed at defining the divide between the holdings to be financed in the crop cultivation (per UAA ha) and livestock (per LU) sectors.

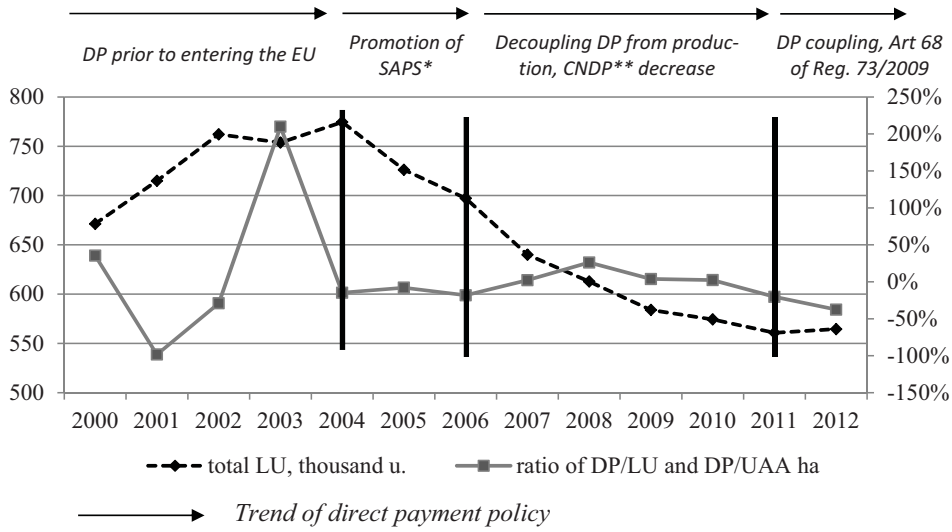
Similarly to the many of the other new EU members, the contraction of the livestock sector in Lithuania was conditioned by the following factors of the CAP reform in 2003 (Figure 4):

- Direct payments (flat-rate) policy promotion (impact appeared from 2005);

[11] According to the EUROSTAT data, the number of bovine males diminished the most, i.e. by approximately 34%, the number of diary cows decreased by about 29% and that of heifers – by around 11%.

- Rapid promotion of decoupling direct payments (impact appeared from 2007);
- Decline in national direct support (most of it was focused on supporting the livestock sector) as the ratio of EU direct payments increased (impact appeared from 2008).

Figure 4. Livestock units of livestock sectors financed by direct payments and ratio between DP/LU and DP/UAA ha in Lithuania, 2000-2012



** Single Area Payment Scheme (SAPS)*
*** Complementary National Direct Payments (CNDP)*

Source: Prepared by the author according to the MA[12] and AIRBC[13] data, 2013.

Until 2004, the ratio of allocating direct payments to the livestock and crop cultivation sectors in Lithuania was strongly fluctuating. In terms of overall numbers, an average of EUR 8.4 million per year was allocated as direct payments for funding the livestock sector during the period of 2000-2003, i.e. 132.5% more compared to EUR 3.6 million allocated for the support of the crop cultivation sector. An increase in the livestock units in Lithuania is noticed during this period.

[12] MA – the Ministry of Agriculture of the Republic of Lithuania.
[13] AIRBC – Agricultural Information and Rural Business Centre.

When Lithuania entered the EU in 2004 and started implementing the CAP, the ratio of the sector support was stabilized, yet, it was also promoting the single area payment scheme. In 2006 the LU was equal to the one in 2000, i.e. one of the lowest indicators since 1991 (restoration of Lithuania's independence). As the implementation of the CAP continued in Lithuania, the largest portion of the direct payments, especially the ones for livestock breeders, was decoupled from production. This resulted in a rapid decline of LU which was further impacted by the decreasing portion of national support to the livestock sector conditioned by the growth of the EU support.

The signs of contraction of the livestock sector in Lithuania had an impact on the urgent actions taken to correct the direction of direct payment policy. Since 2011 the provisions of Article 68 (1) of Council Regulation (EC) No. 73/2009 have been applied, i.e. the coupling of direct payments with production scopes has been reestablished to support meat breeding livestock production in Lithuania. The contraction of the livestock sector was halted; however, the critical level of LU, i.e. the lowest since 1991, was reached.

According to the results of the data analysis, the direct payments allocated for support of the livestock sector within the period of 2004-2012 amounted to the average of EUR 68.8 million per year which was less than the amount (EUR 96.2 million) allocated to support the crop cultivation sector by 28.5%. When comparing the period of 2004-2012 with the period of 2000-2003, it could be seen that the allocation of direct payments to the Lithuanian crop cultivation sector was 3.5 times swifter than that to the livestock sector. This resulted in the change of focus of the Lithuanian farmers who decided to transfer to the crop cultivation industry. Even though such structural changes were largely influenced by the trends of the direct payment policy, other economical factors, e.g. the difference of consumption increase in distinct fields of agriculture, fluctuations of the differences of the market prices for crop cultures and livestock production, etc., also had a significant role. Due to all the listed reasons crop cultivation became a much more appealing choice compared to animal husbandry. According to the data of 2011 available at the Farm Accountancy Data Network (hereinafter referred to as the FADN), the lowest values of ratio of return of assets and ratio of net profit with subsidies per annual work unit (hereinafter referred to as the AWU) or per 1 ha of UAA were noticed in the livestock holdings (Table 1).

Table 1. Net profit with subsidies and return on assets according to FADN types of farming, 2011

Types of farming	Farm net income, in EUR	Family remuneration, in EUR	Net profit with subsidies, in EUR			Return on assets, %.
			Total	per 1 ha of UAA	per 1 AWU	
Specialist cereals, protein, oilseeds	25481	5335	20146	204	11992	11.27
General field cropping	16759	5294	11465	241	7034	10.18
Horticulture, permanent crops	17381	5458	11923	917	5651	16.91
Specialist dairying	12149	6154	5995	197	3445	7.24
Grazing livestock	5067	6029	-962	-52	-605	-1.84
Specialist granivores	9407	5846	3561	326	2012	4.45
Field crops-grazing live-stock	14163	6319	7844	182	4560	8.68
Various crops and livestock combined	4495	5654	-1159	-76	-773	-2.22

Source: Prepared by the author according to the FADN (2012).

According to the data of 2011 available at the FADN, the holdings which raised livestock were among the least profitable businesses. The net profit with subsidies[14] for grazing livestock holdings was negative. The annual losses constituted from EUR 850 to EUR 1000 in average in 2011. The amounts were calculated after deducting the family farm work from the farm net income with subsidies. In accordance with the data of 2011 available at the FADN, the value of the family remuneration was not varied according to the farming types and reached up to 10% when using the average size of all holding types in the calculations. The largest impact to the ratio of net profit with subsidies was held by the subsidy portion of the ratio of gross profit with subsidies. Also, the return on assets[15] of holdings with grazing livestock was one of the lowest and most often in the negative, i.e. from -1.8% to -2.2% in average. The ratios of return on assets of farms cultivating specialist cereals, protein, oilseeds, general field cropping and horticulture holdings exceeded the ratios of livestock holdings by more than 40%.

[14] All direct support payments and VAT deductions, including support for investments.
[15] Return on assets is the ratio of the net profit and the total revenue according to the farming types.

Determining the direct payment need for the livestock sector in Lithuania as of 2014

To ensure positive return on assets and net profit of livestock holdings, the below described calculations were carried out with the aim to determine the size of the direct payments for the livestock sector in Lithuania as of 2014. Based on the initial data of 2010-2011 available at the FADN (sample: 1300 of returning holdings), the net profits of farmers were optimized by setting the optimal ratio between DP per ha of UAA and per LU, i.e., finding the minimum and maximum of function at any range of function: $f(x^*) = min_{x \in X} f(x)$. Here X is a set of possible outputs from the set $\boldsymbol{R}^n$, $x^* \in X$ – the point of the global minimum of function *f(x)* in the *X* area, $f(x^*) \leq f(x), \forall x \in X$ [Корнев *et al*, 2008].

In consideration of the consumption and revenue in the crop cultivation and livestock sectors (according to the data of 2010-2011 of the FADN), certain sizes of direct payments were determined to balance the support for various types of farming and ensure that the farmers were financially interested in agricultural activities in the livestock field, i.e. the objective to optimize the net profit of farmers was completed. The results of this objective showed that in case of similar economic conditions to those of 2010-2011, the ratio between the size of payments in the crop cultivation (direct payments per ha) and livestock (direct payments for unit (head or ton)) sectors should be as follows: 1:1.44 for support to breeders of bulls, 1:1.5 for support to breeders of suckler cows, 1:1.6 for support to breeders of other beef cattle, 1:0.11 for support to breeders of sheep/ goats, 1:0.11 for support allocated for cattle for slaughter, and 1:0.22 for support allocated for one ton of produced and sold milk. The payments allocated to support the livestock sector must be strictly coupled with the production.

Under the above listed conditions, the return on assets and the net profit with subsidies would have positive values and promote slight structural changes towards livestock farming in Lithuania.

5.4. Application of the direct payment scheme of the CAP for 2014-2020 in Lithuania

During the upcoming period of the CAP application the member states can voluntarily provide the farmers with support coupled to production. The member states which employed the Single Area Payment Scheme till 2013, can decide to use up to 13% of the national ceiling for financing of direct payments set forth in Annex II of the Direct Payments Regulation for 2014-2020 [European… 2013]. The decision must be made till August 1 of the year prior to the first year of using such support. In consideration of the application of the transitional

regulation in 2014, the provisions concerning the said coupled support would be in effect only as of 2015.

Based on the analysis of the optimization of farmers' net profits in the fields of crop cultivation and livestock farming and in consideration of the national ceiling, the need for funds necessary for the support of the Lithuanian livestock sector in 2015-2020 was calculated (Table 2).

Table 2. The need for support funds by direct payments in the livestock sector in Lithuania in 2015-2020

Support	2015	2016	2017	2018	2019	2020
For bulls, in million EUR	9.3	9.5	9.7	9.9	10.1	10.3
For suckler cows, in million EUR	5.3	5.4	5.5	5.7	5.8	5.9
For beef cattle, in million EUR	10.8	11.0	11.3	11.5	11.7	12.0
For slaughtered cattle, in million EUR	4.2	4.3	4.4	4.4	4.5	4.6
For quota milk, in million EUR	29.1	29.7	30.3	30.9	31.5	32.1
For sheep/ goats, in million EUR	1.4	1.4	1.5	1.5	1.5	1.6
Total, in million EUR	60.2	61.4	62.6	63.8	65.1	66.4

Source: Prepared by the author according to the European Commission data (2013), 2013.

Starting from 2015, no less than EUR 60 million should be allocated to support the livestock sector in Lithuania. The total financing need during 2015--2020 would amount to EUR 379.5 million.

The said support opportunities of the scheme for 2015-2017 would be insufficient to promote the growth of the livestock sector in Lithuania, considering the application of the maximum permissible amounts of voluntary coupled support scheme. The maximum financing limitations for the support of livestock sector would be able to provide full input towards the restoration of the livestock sector only from the year 2018 (Table 3).

Table 3. The differences between financing possibilities of the coupled support scheme for 2015-2020 and the need of financial support in Lithuania

Specification	2015	2016	2017	2018	2019	2020
Maximum financing limits according to the scheme in Lithuania, in million EUR	54.3	57.5	60.7	64.0	67.2	67.2
Required support for the livestock sector, in million EUR	60.2	61.4	62.6	63.8	65.1	66.4
Lack of funds, in million EUR	-5.8	-3.8	-1.9	0.1	2.1	0.8
Financing need for livestock sector from national ceiling, in %	14.4	13.9	13.4	13.0	12.6	12.8

Source: Estimated by the Lithuanian Institute of Agrarian Economics, 2013.

These signs of financing insufficiency are not significant and range from 1.4% in 2015 to 0.4% of national ceiling in 2017. However, even such a small difference in numbers could be crucial to the development of the livestock sector in Lithuania. According to the financial opportunities set forth in the coupled support scheme, a total of up to 96.9% of the required support in form of direct payments for the livestock sector in Lithuania would be provided.

It is important for Lithuania and other EU member states which are faced with similar problems of agricultural structural changes to pay attention to and take advantage of the complementary support of the livestock sector from national sources, i.e. by using the support of the transitional national aid according to the provisions set forth in the draft Regulation for Direct Payments. In the case of Lithuania, this support is related to the Complementary National Direct Payments, the majority of which is decoupled from the production output. Thus, the application of such support must be fragmented and based on the estimate of the real impact on the restoration of the livestock sector.

5.5. Conclusions

When implementing the CAP reforms and decoupling direct payments from production, both the relative number of livestock holdings and the number of cattle in the member states decreased. The most significant contraction of the livestock sector was noticed in Lithuania, Romania and Malta.

It was determined that the contraction of the livestock sector and the changes of focus of the Lithuanian farmers towards crop cultivation which became more appealing economically compared to animal husbandry were preordained by the following factors: direct support (flat-rate) promotion policy (as of 2004), rapid promotion of decoupling direct payments from production (as of 2006), and the decline in national support (most of which was focused on supporting the livestock sector) as the ratio of the EU direct payments increased (as of 2008). When comparing the period of 2004-2012 with the period of 2000-2004, it could be seen that the allocation of direct payments to the Lithuanian crop cultivation sector was 3.5 times swifter.

Optimization of the net profits of the holdings of the Lithuanian farmers showed that to stop the change of focus of the farmers towards crop cultivation, the ratio between the amounts of payments in the crop cultivation (direct payments per ha) and livestock (direct payments for unit (head or ton)) sectors should be as follows: 1:1.44 for support to breeders of bulls, 1:1.5 for support to breeders of suckler cows, 1:1.6 for support to breeders of other beef cattle, 1:0.11 for support to breeders of sheep/ goats, 1:0.11 for support allocated to

cattle for slaughter, and 1:0.22 for support allocated per one ton of produced and sold milk.

According to the results of the optimization calculations and the outlook of financing opportunities by direct payments of the CAP in Lithuania during 2015-2020, the need for funds necessary for the support of the livestock sector was calculated. The use of the coupled support scheme of the CAP for 2015-2020 according to the maximum financing limitations, i.e. 13% from the national ceiling, would cover the majority (96.9%) of the needs for financing in the livestock sector by applying direct payments. However, during the period of 2015-2017, it would be necessary to receive a portion (3.1%) of financial resources from the national budget by employing the transitional national aid scheme.

References

1. Brooks C., (2007), *Consequences of increased global meat consumption on the global environment - trade in virtual water, energy & nutrients*. [Interactive]. Available from internet: <http://woods.stanford.edu/ environmental-venture-projects/consequences-increased-global-meat-consumption-global-environment>.
2. Earth Policy Institute, (2011), Rising Meat Consumption Takes Big Bite out of Grain Harvest. [Interactive]. Available from internet: <http://www.earth-policy.org/data_highlights/2011/highlights22>.
3. European Commission, (2003), *Council Regulation (EC) No 1782/2003 of 29 September 2003 establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers and amending Regulations (EEC) No 2019/93, (EC) No 1452/2001, (EC) No 1453/2001, (EC) No 1454/2001, (EC) 1868/94, (EC) No 1251/1999, (EC) No 1254/1999, (EC) No 1673/2000, (EEC) No 2358/71 and (EC) No 2529/2001.* [Interactive]. Available from internet: <http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod! Do-Number&lg=en&type_doc=Regulation&an_doc=2003&nu_doc=1782>.
4. European Commission, (2009), *Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers, amending Regulations (EC) No 1290/2005, (EC) No 247/2006, (EC) No 378/2007 and repealing Regulation (EC) No 1782/2003*. [Interactive]. Available from internet: <http://eur-lex.europa.eu/Result.do?T1=V1&T2=2009&T3=73&Rech Type =RECH _naturel&Submit=Hae>.

5. European Commission, (2012), *50 years of common agricultural policy. Ready for the future. A partnership between Europe and farmers.* Luxembourg : Publications Office of the European Union, 2012. ISBN 978-92-79-23265-7. doi:10.2762/35894.
6. Europos Sąjungos Taryba, (2013), *Pasiūlymas dėl Europos Parlamento ir Tarybos reglamento, kuriuo nustatomos pagal bendros žemės ūkio politikos paramos schemas ūkininkams skiriamų tiesioginių išmokų taisyklės (BŽŪP reforma).* – Pirmininkaujančios valstybės narės parengta reglamento projekto konsoliduota redakcija. Briuselis, 2013 m. kovo 12 d. (15.03), 7183/13.
7. Gay S.H., Osterburg B., Baldock D., Zdanowicz A., (2005), *Recent evolution of the EU Common Agricultural Policy (CAP): state of play and environmental potential.* Specific targeted research project n°SSPE-CT-2004-503604, Impact of Environmental Agreements on the CAP, Document number: MEACAP WP6 D4b. [Interactive]. Available from internet: <www.ieep.eu/assets/224/ WP6D4B_CAP.pdf>.
8. Hogberg M.G., Fales S.L., Kirschenmann F.L., Honeyman M.S., Miranowski J.A., Lasley P., (2005), *Interrelationships of animal agriculture, the environment, and rural communities.* J ANIM SCI June 2005 vol. 83 no. 13 suppl E13-E17. [Interactive]. Available from internet: <www.journalofanimalscience.org /content/83/13_suppl/E13.full>.
9. Horne S., (2013), *Recouple support to boost production - Stephen Carr* . Farmers Weekly. [Interactive]. Available from internet: <http://www.fwi.co.uk/articles/13/11/2013/141979/recouple-support-to-boost-production-stephen-carr.htm>.
10. La Via Campesina (2013), Food Sovereignty and Trade. *Europe :The CAP is in danger unless it is socially legitimate!* Published on Wednesday, 06 March 2013 21:37. [Interactive]. Available from internet: <http://viacampesina.org/en/index.php/organisation-mainmenu-44>
11. Mangi P., *Intelligence calls for a flexible CAP 2014 with countercyclical payments.* President Coop de France. [Interactive]. Available from internet: < http://www.momagri.org/UK/focus-on-issues/Philippe-Mangin-President-Coop-de-France-intelligence-calls-for-a-flexible-CAP-2014-with-countercyclical-payments_1200.html>.
12. Matthews A., 2011. *The future for national envelopes and Member State flexibility in Pillar 1.* [Interactive]. Available from internet: <http://capreform.eu/the-future-for-national-envelopes-and-member-state-flexibility-in-pillar-1/>.

13. Melnikienė R., (2011), *Lietuvos Respublikos ilgalaikės gyvulininkystės plėtros strategijos iki 2020 metų koncepcija.* Lietuvos agrarinės ekonomikos institutas, 2011. [Interactive]. Available from internet: <http://www.laei.lt/x_file_download.php?pid=1497>.
14. Viaggi D., Raggi M., Gallerani V., Gomez y Paloma S., (2010), *The impact of EU Common agricultural policy decoupling on farm households: income vs. Investment effects*. [Interactive]. Available from internet: <www.intereconomics.eu/downloads/getfile.php?id=734>.
15. Корнев В.В., Курдюмов В.В., Рыхлов В.С., (2008), *Прикладные методы оптимизации.*

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6. The impact of the current and new agricultural policy on the development of the major crops in Bulgaria

The study aims to scrutinize the impact from introduction of the new agricultural policy after 2013 on five main crops in Bulgaria: wheat, barley, maize, sunflower and rapeseed. These five crops make up for 55% of the utilized agricultural land in Bulgaria and over 90% of the arable land. The basic methodology used in the analysis is the scenario approach, where based on the modeling is evaluated and compared the impact of the current and new policy on the area, production, the subsidy level, gross return, etc implications. The projection of the baseline indicators is stretched by 2017 and illustrates the state of these sectors under both policy scenarios. It is found out that the changes in the CAP will drive to more favorable effects on the productions apart from the analyzed five main ones and probably will contribute to a bigger diversification and shrug of the abandoned land along with minimal decrease in the five crops' area.

6.1. Introduction

The agricultural sector is the sole sector in the Bulgarian economic industry, which in the last years manage to form up a positive trade balance, where the export exceeds the import in value terms. Abreast with that, Bulgaria is a very open economy strongly depending on the import of the resources and energy sources and other technological and household goods, thereof the productions providing the inflow of foreign capital and currency are considered as important and crucial.

The study aims to scrutinize the impact from introduction of the new agricultural policy after 2013 on five main crops in Bulgaria: wheat, barley, maize, sunflower and rapeseed. These crops are considered as major productions because they comprise for around 55% from utilized land and more than 90% from arable land in Bulgaria in recent years. Along with that, these 5 crops make around 75% from GO (Gross Output) and around 43% from GAO (Gross Agricultural Output) in 2011. About 63 thousand farms are specialized in growing these 5 crops during 2010. Their export volumes reaches up to significant share in the agricultural trade worth, which positions Bulgaria to 12 place in the wheat world trade and 2 place for the sunflower worldwide trade (after Hungary) in 2011.

According to [Ivanov *et al* 2013] the cereal (wheat, barley and maize) and oil crops (sunflower and rapeseed) have historical and immense strategic importance for sufficing the consumption needs of the population, for the national economic growth and for the trade balance of the country. In the last years, the importance of these crops enhances, which is attributed to some shrink of other agricultural sectors, mainly fruit and vegetable growing rather than to a tremendous expansion and domination of the five crops itself.

It is argued that the cereal and oilseed crops are ones of the underlying commodities in terms of production security [Mitova 2012]. They provide a consistent demand in the domestic market, relatively autonomous from the economic situation and valorises on the propitious conditions for export bound to the Turkish and European markets. During 2011, the gross value of all cereal and industrial crops is estimated up to 1,18 billion EUR for cereal and 0,92 billion EUR for latter one.

Atanasova [2011] claims that the production, especially of the wheat represents the backbone of the Bulgarian agriculture and to a great extent of the Bulgarian trade, where the wheat makes up the greatest role and value share. It is reported that mainly for the cereal and at less extent to the oil crops, their development is mainly driven by extensive factors rather than intensive. [Atanasova 2011] argues that gross wheat output in Bulgaria increases slower compared with the areas, whereas it exceeds the wheat metric production due to the price spikes observed in the last years. Thus, it is pointed out that the development of the main cereal crop – wheat is mainly based on the area widespread, while the yield fluctuates at approximately same levels and the gross wheat output scores a raise due to global cereal price increase.

On the other hand, the sunflower and rapeseed, the major oilseed crops show an incessant growth through the years. Since the accession of the country in EU, the areas covered by sunflower increase moderately, while those with rapeseed elevate considerably explicated by the role of subsidies distributed on area basis [Mitova 2012]. The direct payments are distributed decoupled from the production but they propel the expansion of the arable land, as sunflower and rapeseed very well knitted to the production cycle, providing a crop rotation of sown with planted crops.

The prosperous conditions for the development of the sunflower are stated by [Atanasova 2011], who evaluates the competitiveness of the sunflower as very high but this competitiveness does not correspond with the potential possibilities of the country to derive more sunflower output by less area, to increase the yield and to improve the quality of the production through agro-technical modernization.

Having in mind the importance of the production of these 5 crops and their substantial role in the gross agricultural output and agricultural trade balance is raised the question for the future impact of the agricultural policy on the development of these productions. The objectives of the paper are to make comparative analysis of the basic indicators, representing these production impacted by the current (status quo policy) and the new policy.

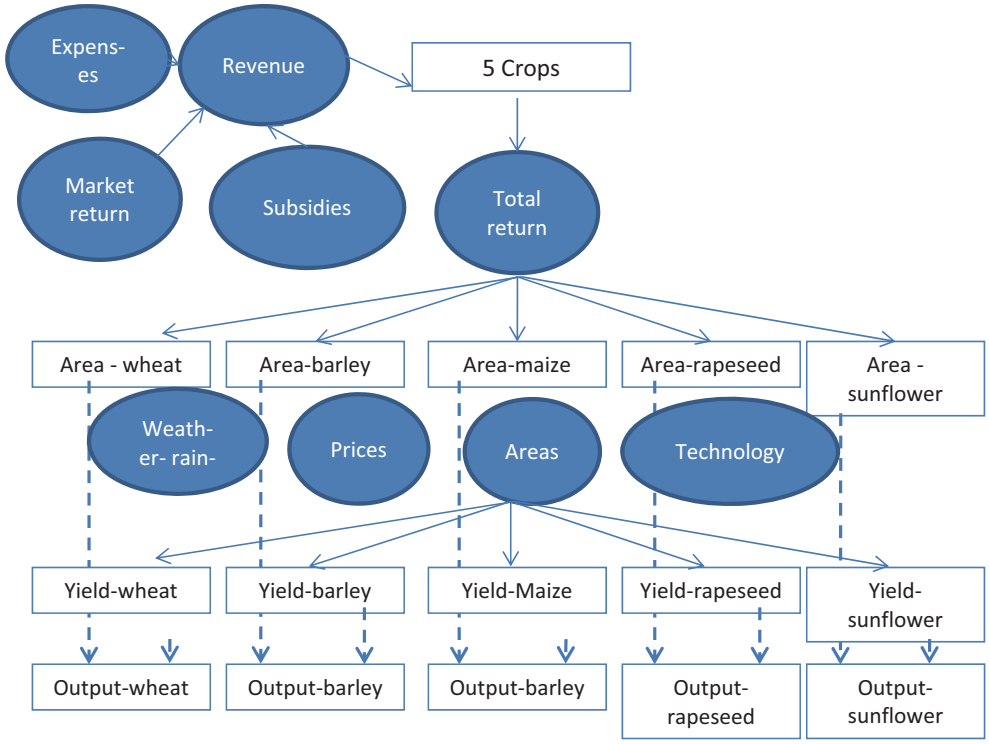
The impact of new policy is examined through the implementation of the basic payment scheme (BPS) and application of the redistributive payment. The goal and objectives related to the impact analysis of the current and new policy are bound to identify the changes that will occur in the baseline indicators – gross margins, subsidy payments, areas, productions and cross-redistribution of basic payments between these 5 crops and other sectors. The projection of the baseline indicators is stretched over 5 years period and illustrates the changes in these indicators under different scenarios and scenarios variants, which procreates conditions to see different effects from the policy implementation and to devise decisions, which to drive the results from the policy in the desired edge.

6.2. Methodology

The basic methodology used in the analysis is the scenario approach, where based on the modeling is evaluated and compared the impact of the current and new policy on the area, production, the subsidy level, gross return, etc implications. The econometric modeling is used to trace up the development of the selected 5 crops under the current and new policy, assessed through alternations of the areas, gross return and production outputs. The applied model is elaborated by CAPA project[16]. The CAPA crop model is deterministic, presenting partial equilibrium and linked with the GOLD (grains, oilseed, livestock and dairy) model for EU elaborated by FAPRI for the price factoring. Abreast with that the CAPA model for cereal baseline projection is not an adapted GOLD model used by FAPRI; it is rather a new model linked with the GOLD model and incorporating the Bulgarian needs and conditions in terms of data availability and market-industrial specificities.

[16] The CAPA project – "Establishment of the Centre for Agri-Policy Analysis" is financed by the America for Bulgaria Foundation goals to elaborate a system for analysis of the agri-policy using the econometric methods. The covered by the project sectors belong are cereal, dairy, meat and horticulture. The research is implemented by a team from the IAE and the Food and Agriculture Policy Research Institute (FAPRI) of Missouri University in the USA.

Figure 1. Diagram of the major crops model system



Source: CAPA project.

The basic GOLD model incorporates the major policy instruments associated with Common Agricultural Policy market organisations, as well as external trade commitments made by the EU in the context of the World Trade Organization [Hanrahan 2001]. At the level of the individual country commodity models, most prices are linked to French market prices, which are generally the EU market clearing prices. Assuming a given French price, price linkage equations (specified in each non-France sheet) determine domestic prices as a function of the French price [Hanrahan 2001]. Along with that, the FAPRI modelling system albeit it evolves through the time it is always subjected to real situation and market conditions. For example, regarding the supply side of the crop model are incorporated the influence of commodity programs by including the support scheme and the expected market return, posting the voluntary nature of the commodity programs [Devadoss 1989].

The CAPA Cereal model[17] gives insights and illustrates results on the 5 major crops in Bulgaria, outlining the entire supply and demand pattern and transmitted by the feed balance with the livestock model. The Cereal model is underlain as an econometric modelling, where:

$Y = f(X_1; X_2; X_3)$

$Y = \alpha + \varepsilon\beta_1 X_1 + \varepsilon\beta_2 X_2 + \varepsilon\beta_3 X_{3....} + \xi$ ……, where

α – intercept, while ε - elasticity

β – regression coefficient with $X_{1,2,3}$ - variables

ξ – factor error

The area of major crops, their yields and productions are derived as above-shown equation, while the gross margins, subsidies, expected market returns, the redistribution of the payments among the different crop sectors are estimated using the recapitulation method. The production equation stands as an identity, representing the multiplication of the harvested area per each crop and its yield. The area equation is divided into total area covered by 5 crops and the reallocation of this area among them and is composed of the gross return and expected return variables. The gross margins and the expected market returns are aggregated variables, including the detailed recapitulation of the market revenues, production costs, all subsidy components and aids. The area depending variable is equated as an exclusively economics function, assuming that the farmers decision what to grow and how much of the land to be utilized is determined by the economic rationality and modulated by the production adherences, as crop rotation practices for example implied by the elasticity coefficient.

The recapitulation method is used as well to aggregate the values for the gross and expected market returns so to sum up the subsidy levels during the thorough data series range. The projections of the baseline indicators is done over 5 years, as historical data is collected since 1998, which is considered as the watershed year with reliable numbers and commensurate indicators. The recapitulation method is applied to see the divergences from the implementation of the redistributive element of the direct payments and what will be the effects on different crop productions. Along with the cereal and oilseed major crops are analyzed the industrial with potatoes, fruit, vegetables, etheric crops and grasslands, where the major crops subsidizing through the new program period is compared with the likewise aiding of the latter productions. It is done, assuming that the direct payments in countries as Bulgaria are a significant factor driving

[17] The CAPA Cereal model is the first of the group of models planned to be done by CAPA and includes not only the cereal crops (wheat, barley and maize) but also oil ones (sunflower and rapeseed) and although, it deals with both groups for shortening and better discernment of those crops with other crop groups is coined as Cereal model.

farmers' decisions to bind either to one or another crop. The data sources used are mainly national, from the National Statistics Institute and the Ministry of Agriculture and Food and Payment Agency. The national sources are employed to generate data concerning the production, yield, area and other natural indicators, while the figures on the direct support is combined from national reports and EU issues. External sources are also used, EUROSTAT, FAO, private research firms[18], etc. Whenever a lack of data is met, the experts' judgment was applied, facilitated by the establishment of the particular network from experts and practitioners, reviewing the raw data and evaluating the exodus outcomes.

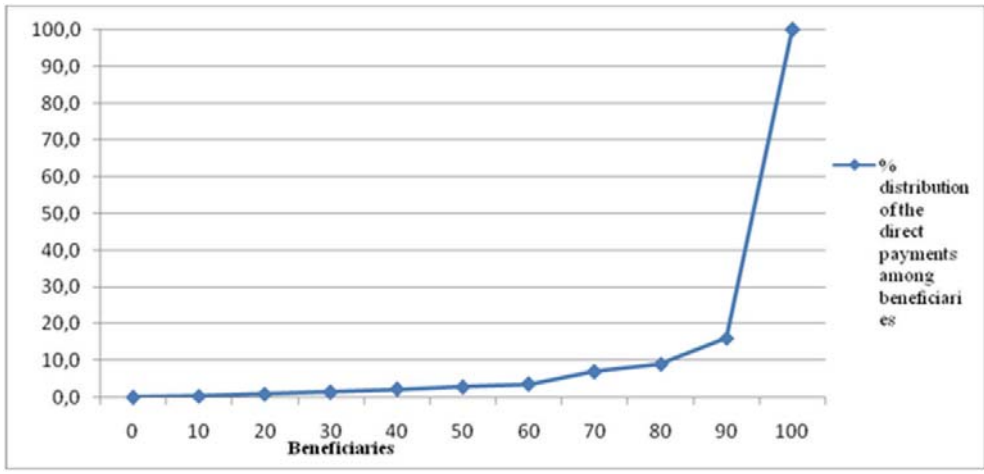
6.3. The impact of the public support in the period 2007-2013

According to [Ivanov *et al* 2012] the determination of the direct payment at the base of the utilized area or the subsidies received for a previous period leads not only to structure disproportions at a sector's level, but to a strong irregularity of the distribution of the aids among the individual beneficiaries. The irregular distribution among the beneficiaries raises a lot of questions, although it flows out from the principle of the support's determination (historical approach) and the farms' structure. In the EU on the whole, 20% of the companies receive 80 % of the support, while in Bulgaria about 10% of beneficiaries receive 82% of the direct aids (figure 2). It is well known that frequently farms which have considerable incomes from subsidies redirect these means toward consumption and investments out of agriculture, which in no way corresponds to the declared aim of agricultural support.

At the same time, the disparity in the distribution of the direct payments among farmers raises the question upon big, agro-industrial farms, which fulfills economies of scale and which are more lucrative and due to that their level of support should be not the same and proportional of the produced in the past or based on the obtained historically aid [Popov 2011]. Regarding the role of the direct payments for the CAP 2007 – 2013, [Mitova 2012] points out that cereal and oilseed crops are privileged compared to vegetables, fruits and grape production because the amount of received payments represents about 33% of the costs per ha. In addition, the farms specialized in the major crops' production are predominantly relatively big farms, which manage to accumulate immense amount of direct support, to synergize due to high market prices in the last years and to gain comparative advantages to other crops.

[18] The publications "Strategie Grains" of Tallage research firm specialized in agro-economic European markets of grain are taken into account http://www.tallage.fr/vitrine/.

Figure 2. Distribution of the subsidies and beneficiaries in 2010



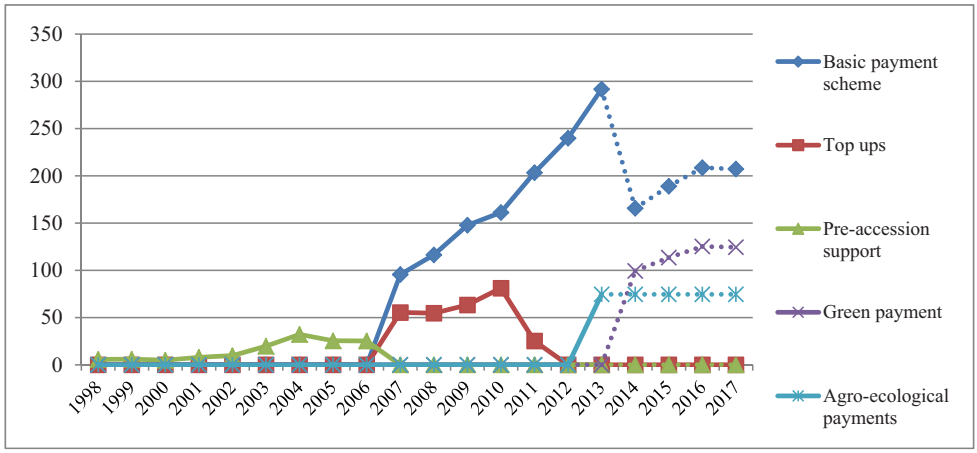
Source: IAE based on the EC data[19].

As it was pointed out although the subsidies are decoupled from the production, in case of Bulgaria they are underlying factor driving allocation of the land resources. The subsidies for the years after 2007 substantially exceed the level of support before the accession, which boosts up the interest to the land and leads to an apparent increase of the agricultural profitability mostly felt by the producers from cereal sector. Since 2013, farmers engaged in the cereal and oilseed sectors have been subject to a complementary support scheme proposed by II Pillar and Measure 214 for agro-environmental activities and average increase per ha for the major crops is estimated up to about 38 EUR/ha and the total accumulated aids may tally up to 185 EUR/ha (figure 3).

Regarding the new CAP period, the decomposition of direct support is thought to impact on the production pattern, which is attributed to the strong reduction of the flat support and adoption of higher coupled support percentage and target support to small, young farmers and ecological practices. The greening is deemed to have the strongest effect on the major crops' structure in Bulgaria, as mostly it is implied to shrink the total area covered by these productions due to 5-7% requirement for set-aside. It is expected that producers growing 5 crops will continue their interest to get the green component payment and will follow the requirements, which will eventuate in a slight fall of their areas superseded by other, pulse crops particularly.

[19] European Commission. http://ec.europa.eu/agriculture/cap-funding/beneficiaries/direct-aid/index_en.htm.

Figure 3. Public support distribution in the major sectors, BGN/hectare



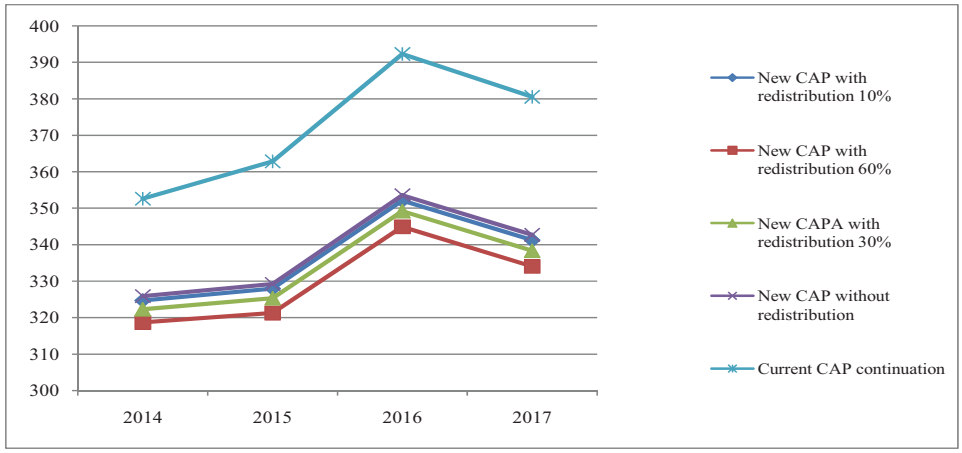
Source: CAPA based on the EC regulation information.

6.4. Changes in area and production

Following up the model logical framework charted in Fig. 1, the supply of the major crops is constituted of area and yield, as area is determined the profitability and substitution among crops. In Figure 4 is shown the projected changes in the gross margins under different scenarios. The change in the policy is expected to scant the gross profit generated by major crops compared to the status quo policy. This is imputed chiefly to the alternations in subsidizing, as divergence in the margins varies around 10%. The biggest amount of gross profit would have been obtained with the extension of the CAP 2007-2013, explicated by the unconditional and undifferentiated distribution of aids regardless the size, production and type of farmers.

However, the new policy will push the subsidy support down concerning the major crops as the highest reduction of the payments might be reported by the introduction of the distributive element. Regarding the distributive scenario split into variants of 10%, 30% and 60% increase to the basic payment for the first 30 ha, the gross margins will be plumbed. The strongly distorted structure of the farmers receiving direct payments, where 84% are holdings applying with up to 30 ha land for support will be able to pull up between 10-15% of the national financial package for redistributive payment. Thus, it will lessen the subsidies received by producers of major crops and their gross revenues will be slumped.

Figure 4. Average gross margins under different scenarios, euro/ha

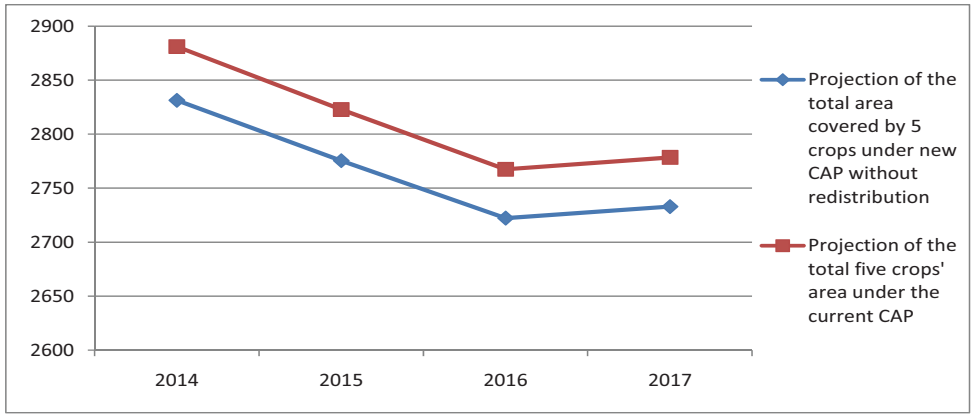


Source: CAPA.

Regarding the percentage of the redistribution – 10%, 30% or 60%, the divergence in the gross margin is reported to be very little within 1-2%, as most closely to the gross margin under continuation of the CAP 2007-2013 will be the new CAP without redistribution. The biggest decrease in the gross margin per ha will be accumulated by redistribution of 60% over the average BPS for the first 30 ha and it will gradually heighten with minimizing of the redistribution. As it was stated the gross margin is considered as hefty factor determining the major crops' area coverage. In Fig. 5 is illustrated the difference in the total area of major crops under both scenario – continuation of the current and introduction of new CAP.

The projected area for major 5 crops under both scenarios is expected to differ, as the divergence is estimated to less than 5%. Although, the difference in the gross profit per ha between both scenarios is evaluated up to 10%, the resulted lowering of the total area at the implementation of new policy is not proportional and scores up to about 45 000 ha annually. The reasons are various, as the greatest one is imputed to the elasticity of the area dependency to the gross margins. Actually, these 5 crops are considered as productions, which difficulty might be substituted and the lack of real alternative leads to lessening of the elasticity and the options of farmers to switch to other productions.

Figure 5. Total five crops' area projection, thousand ha



Source: CAPA.

Abreast with that, the total area of major crops is estimated to decline in next couple of years under both scenarios, as in 2017 is thought to have a slight stabilization of the area around 2 775 Mha. That happens on the background of an estimated slimly increase of the gross margins in years 2014-2016 and relates to the assumed function of the area projection, which is implied with a lag time. The area function represents the expected crop yield dummied as a yield trend and the lagged prices and costs for crops for 3 years behind weighted with different coefficients[20]. The notion of such approach is to presume the factoring of the expected gross margins for farmers, who guess the future prices and eventual costs upon the past experience and conditions. Another effect from lagging the gross margins, participating in functioning of the area coverage is preclusion from incidental spikes and falls in the prices and costs and their moderation.

Although, the total area of major crops notes a slight decline comparing both scenarios, the question of internal pattern of them is also crucial. In the model, the substitution between these crops is an economic function, including the expected market return. In case of separate crop area, the subsidies are excluded as a factor determining the area allocation. It is conjectured that the decoupled character of subsidies doesn't impart upon the internal allocation of crops and farmers are indifferent which crop will grow because the subsidy level is given per area. In relation to that, the farmers' decision for growing different crops is determined by the cross-market return generated by those crops, where the relative increase of the expected market return of one crop compared to other ones will shift their preference to that one.

[20] The coefficients are set 0,5 for the previous year prices, 0,3 for 2 year and 0,2 for the third.

Table 1. Substitution of the area among 5 crops comparing the new Policy without redistributive payment with current policy continuation

Crops	2013	2014	2015	2016	2017
	thousand ha				
WS - wheat	0.00	-20.5	-18.6	-16.9	-16.8
BA - barley	0,00	-2.7	-2.4	-1.9	-1.8
CO - maize	0.00	-7.7	-7.7	-7.8	-8.1
UF - sunflower	0.00	-3.0	-2.7	-2.5	-2.4
RS - rapeseed	0.00	-12.9	-12.7	-12.6	-12.9

Source: CAPA.

In Table 1 is shown the area substitutions among particular crops in the years after 2013 and compared the consequences for the area under new policy with current policy continuation without redistribution element. The indicated by Figure 5 decline in the major crops' area resulted by the new policy implementation will likely affect all 5 crops but with different strength. The greatest impact evaluated as a decrease in the area is reported for the wheat and rapeseed production, which for the years after 2014 accounts for about 70% out of the total fall of the areas, scoring between 40-50,000 ha annually.

The reported internal substitution of crops' area is caused not only by the economic factors, where the gross return of one to other crops relatively improves but it is driven by the technological dependencies. Farmers in Bulgaria historically follow up different crop rotation schemes, as regarding major crops the most widespread rotations are wheat and barley versus maize, sunflower and rapeseed. The rapeseed usually comes after wheat, which is sown after maize and sunflower, while the sunflower itself is planted on a plot once in 4-5 harvesting years. Thus, farmers weighting the economic benefits from the substitution of particular crops will do that in the context of the agro-technological issues, which explicates the almost balanced decrease of the areas belonging to both rotation patterns.

Apart from comparison between these scenarios, it is conjectured that the total area covered by major crops will decline slowly in the next years compared with the area levels reached in 2012 and 2013. The reasons for that are imputed to the policy changes. In historical terms, the areas with wheat in the future period will fall slimly compared to last years, while the highest decrease is projected for the barley (32%) and rapeseed (30%) [Ivanov *et al* 2013]. At the other pole are positioned the maize and sunflower, where the areas are anticipated to grow up by 14% and 9%, due to relatively better economic outcomes compared to rapeseed and barley [Ivanov *et al* 2013].

Table 2. Difference in the output from 5 crops under the new policy without redistributive payment with current policy continuation

Crops	2013	2014	2015	2016	2017
	thousand t				
WS - wheat	0.00	-80.9	-74.4	-68,3	-68.7
BA - barley	0.00	-8.6	-9.1	-7.3	-7.0
CO - maize	0.00	-37.8	-38.3	-39.2	-41,2
UF - sunflower	0.00	-6.2	-5.7	-5.4	-5.3
RS - rapeseed	0.00	-28.3	-28.7	-29.1	-30.6

Source: CAPA.

In Table 2 is indicated the difference in the major crops' production under scenarios of the new policy juxtaposed with the current policy continuation. As a result of a decrease of the area with all 5 crops under the new policy implementation compared with the scenario for lasting of the CAP regulations from the period 2007-2013, the commodity output ensues also a drop. From the figures might be noted that the biggest decrease in the production would be realized in the wheat output followed by the corn and rapeseed, as these reductions are brought about a foregone yield from the diminished plots covered with major crops under the new policy scenario.

The figures in Table 2 testify not only for the diminished commodity output juxtaposing both scenarios but also spells for the yield expectations. The yields under both scenarios for these crops are the same value and it does not depend on the policy but is factored as technological and weather function. According to [Ivanov *et al* 2013] a positive trend connected to an increase in the average yields for these crops per ha is expected. This is mainly determined by the improvement of the agro-technology in the sector, where the weather conditions are assumed in common range for the next years.

6.5. Policy impact on different farm types and sizes

During the Irish Presidency of the EU in 2013 was announced and later on accepted one of the most important changes in the Pillar I related to the redistributive payment. Introduction of the redistributive payment would allow member states to grant a top-up on the basic payment for the first hectares 30 ha of each farm to take account of the greater labour intensity on smaller farms and the economies of scale of larger farms[21]. The redistributive payment will be calculated by multiplying a figure, which shall not be higher than 65% of the na-

[21] Alan Matthews analysis posted on http://capreform.eu/implications-of-the-new-redistributive-payment/

tional average payment per hectare by the land that the farmer intends to apply for support up to 30 ha limit [EC 2013].

Table 3. Distribution of the BPS between different farm size classes under 3 variants of the distributive payment, euro/ha

Redistribution of BPS in different farm-size classes, euro/ha	2014			2015			2016		
	10% reditribution	30% redistribution	60% redistribution	10% reditribution	30% redistribution	60% redistribution	10% reditribution	30% redistribution	60% redistribution
0 to 10 ha	98	115	142	109.72	129.67	159.63	119	141	174
10 to 30 ha	98	115	142	109.72	129.67	159.63	119	141	174
30 to 60 ha	94	104	119	105.34	116.51	133.32	115	128	148
60 to 200 ha	89	90	91	99.98	100.46	101.19	109	109	110
200 to 700 ha	87	84	80	98.26	95.29	90.86	107	104	99
over 700 ha	87	83	78	97.78	93.83	87.94	106	102	96

Source: CAPA based on the EC data and Payment Agency.

The impact from the introduction of CAP 2014-2020 may lead to different changes and magnitudes, as in Table 3 is estimated the level of basic payment set up under 3 variants of the redistribution. As a consequence of the farm structure characterizing the direct payment scheme appliance, the differences in separate variants, namely 10%, 30% and 60% are estimated up to 45%. Those households disposing and declaring up to 30 ha account for 85% of all participating in the direct payment scheme farms and increased redistributive payment they can get between 10% and 60% additional subsidy scores up to 45%. Those farms will be the most benefited from the policy novelty.

The small farms have underlying role for retention of the viability of rural areas and their contribution for the employment, and preservation of the cultural and historical heritage should be acknowledged [Popov and Ivanov 2012]. In such farms are concentrated 59% of the cattle, 76% of the pigs and 73% of the sheep. The small farms with less than 10 ha create about 30% of the value added of the sector, a share not to be underestimated [Ivanov *et al* 2012]. At the same time, the eventual decrease in the area payment in the farms over 30 ha varies around 10-25% thus the foregone payments will be quite lower than the gained ones by farms up to 30 ha.

Table 4. Level of the BPS and green payment under 3 variants of the distributive payment upon different production groups

Total amount of BPS and green payment, euro/ha	2014			2015			2016		
	10% redit-ribution	30% redistri-bution	60% redistri-bution	10% redit-ribution	30% redistri-bution	60% redistri-bution	10% redit-ribution	30% redistri-bution	60% redistri-bution
Cereal with fallow	141	139	135	158	156	152	173	170	166
Oil crops	141	139	136	158	155	152	173	170	165
Industrial and potato	148	159	175	165	177	195	181	195	213
Vegetables	149	163	183	167	182	205	184	202	224
Orchards	149	162	182	167	182	204	182	198	225
Etheric-oily crops	151	169	196	170	190	219	185	207	240
Grassland	148	159	176	166	179	196	181	195	217

Source: CAPA based on the EC data and Payment Agency.

In Table 4 is indicated the expected allocation of the subsidies among different variants of redistributive payment unto certain sectors. The effect from the redistributive payment will primarily lead to different payments among diverse farm – size classes but indirectly will entail to divergent support to separate productions. It is explicated by the farms' specialization, which is relatively persistent characteristic and regardless the notion of the direct aids is to be decoupled from the production, it eventually more or less influences the agricultural farming. The figures in Table 4 testify that production sectors will be eventually supported differentially, as major crops belonging to the group of cereal and oilseed crops will receive the smallest per ha amount.

The difference between a hectare support of cereal and oilseed crops and highest benefitted etheric-oily crops is scored in the diapason 7-44% depending on the redistributive percentage. At the same time, the divergence concerning the cereal and oilseed crops under these variants is estimated up to hardly 4% thus they will be not significantly affected. On the opposite pole are deployed others, small-scale productions, as etheric, vegetable, fruits growing, etc, where the increase provided by different variants is assessed up to 23%. Although the maximum per hectare support being supposed concerning other sectors different from the major ones, the effects from subsidizing on them may not be commensurable to major ones due to the cost intensity on a hectare.

6.6. Conclusions

The goal of the paper is to study the impact from introduction of the new agricultural policy after 2013 on five main crops in Bulgaria, comparing it with the current CAP framework and assuming different scenarios and variants. In the analysis was found out that the allocation of subsidies is very unequal and in spite of their decoupled character, they to a great extent influence on the production structure. The new CAP will keep the differences between average payments among member states thus the convergence will continue fulfilling gradually. On the other hand, the internal redistributive payment will differentiate the aids per ha and will normalize a bit the harshly distorted distribution of the payments and beneficiaries. The introduction of the greening will render stronger impulse to pursuing the priorities in terms of environment preservation, biodiversity, climate changes, etc. The effects from the greening on major crops are found out in a slim decrease of the total areas occupied by these crops attributed to the needs for setting-aside ecological plots.

The new CAP will give more incentives to other productions different from the current major ones, which is realized by the figures on farm-size and production support. The productions usually practices in small scale farms, as vegetables, fruits and etheric-oily crops through the introduction of redistributive payment will get bigger per hectare payments and the effect will be as stronger as the differentiated are payments. A finding in the analysis claims that redistributive element will have a minor effect on the support level hence on the production performance of the major crops, while per hectare support on other intensive in terms of land use and costs sectors will be risen up significantly, which may boost up to some extent that farming.

The new CAP regarding the I Pillar is expected to give more flexibility and will overhaul disadvantages in the flat subsidizing of the area and holdings, as a minimal decrease in the areas with cereal and oilseed crops might be compensated and superseded with a bigger increase of the areas with other quite limited productions. Altogether, five crops will continue to dominate in the production structure of the BG agriculture, as the role of the subsidies as a driver of the development will be suppressed slightly.

The split of the SAPS to different schemes – small farms, support for natural constraints, young farmers, etc will ensure better encountering the challenges (aging of the farmers' society, low share of the young people, low incomes of majority of small farms – 94% of all farms are up to 10 ha). It is expected the prices of the commodities to retain relatively high and the volatility to continue and for farmers crucial will become the issues not only regarding subsidies and their amount but they will be more interested to to deal with marketing risks and

to improve their technological practices. In Bulgarian agriculture in next 7 years will be allocated about 4,7 billion euro direct aids, which will unambiguously rise up the agricultural return, especially in the cereal and oilseed sectors but the common benefits for other society apart from farmers will remain pending and the question for social price of the subsidies is very actual.

References

1. Devadoss S., Westhoff P., Helmar M., Grundmeier E., Skold K., Meyers W. and Johnson S., (1989), *A FAPRI modelling - System of CARD. Documentary Summary"*. Technical Report. Ames, Iowa. http://www.card.iastate.edu/publications/dbs/pdffiles/89tr13.pdf. pp.63.
2. EC, (2011), *"Impact assessment. Common Agricultural Policy toward 2020"*.http://ec.europa.eu/agriculture/policy-perspectives/impact-assessment /cap-towards-2020/report/annex3a-d_en.pdf, pp. 113.
3. EC, (2013), *"Proposal for Regulation of the European Parliament and the Council".* http://ec.europa.eu/agriculture/cap-post-2013/legal-proposals /transitional/com2013-226_en.pdf, pp. 22.
4. European Commission, *„Indicative figures on the distribution of the direct aid to farmers"*. Financial years 2008, 2009, 2010, 2011. http://ec.europa.eu/agriculture/cap-funding/beneficiaries/direct-aid/index _en.htm.
5. Eurostat, *"Agriculture Statistics".* http://epp.eurostat.ec.europa.eu.
6. FAO Statistics http://faostat.fao.org/site/342/default.aspx.
7. Hanrahan K. F., (2001), "The EU GOLD MODEL 2.1: An introductory manual". Working Paper. AGMEMOD, http://tnet.teagasc.ie/agmemod /indexa.htm.
8. Ivanov B., Popov R., Jongeneel R., Sokolova E., *"How to create a viable and competitive agriculture: assessing the optimal CAP policy measure mix for the case of Bulgaria".* Avangard Prima, Sofia, 2012.
9. Ivanov B, Sokolova E., Kirovsky P., (2013), *Development trends of the main crops from the cereal sector. Baseline projections,* Institute of Agricultural Economics and Foundation America for Bulgaria, Sofia, Project CAPA. http://iae-bg.com/index.php?pg=News&pid=11. pp. 25.
10. Atanasova M., (2011), *State and competitiveness of the cereal and oilseed crop productions in Bulgaria,* Slavova Y., Atanasova M., Kovacheva T., Koteva N., Bachev H., Mladenova M., Malamova N., Petrova I., Kaneva K., Mitova D., Ivanov B., Mitzov V., Pantaleeva D., Agricultural Academy, pp. 30-62.

11. Meyers W.H., Westhoffm P., Fabiosa J.F. and Hayes D.J., (2010), *The FAPRI global modeling system and outlook process"*, Journal of International Agricultural Trade and Development 6 (1), pp. 1-20.
12. Ministry of Agriculture and Food. *„Agrarian Reports",* Sofia, Years 2000-2013.
13. Ministry of Agriculture and Food. „*Report for the activity of State Fund Agriculture and Payment Agency"*. Years 2009, 2010, 2011, 2012.
14. Mitova D., (2012), *Analysis and assessment of the impact of the CAP and national agricultural policy on the oilseed crop sectors.* Annual Report of IAE 2011-2012: Effects and impact of the CAP on the agriculture and food industry. Sofia, IAE.
15. National Statistical Institute. "*Statistical Yearbook*". Years 2000 – 2012, Sofia.
16. Popov R., Ivanov B., (2012), *Bulgarian agriculture and expected results from the proposed changes in CAP*. Avangard Prima, Sofia, pp.100.
17. Popov R., (2011), *Mid-term priorities of the agricultural policy in Bulgaria.* Avangard Prima, Sofia, pp.110.

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7. Competitiveness of the Romanian agri-food trade and the new agricultural policies

For the last two decades, policies influenced significantly the evolution and performances of the Romanian international agrifood trade. Romania's accession to the EU and the enforcement of the CAP and Single Market rules resulted in new priorities and orientations in the agrifood trade. Consequently, Romania performed better on the intra and extra-EU markets, and the agrifood trade increased significantly both in volume and value. The structure of the trade flows changed as well. The paper is analyzing these changes, which products and groups of products gained and lost on the EU and global markets, how they were influenced by the past policies and the introduction of the CAP. At the same time, the paper is evaluating the influence and possible implications of the new agricultural policy on the competitiveness of the Romanian agrifood trade.

7.1. Introduction

Romania has been, traditionally, and still is, an important producer and exporter of agrifood products. It has one of the largest agricultural areas in the EU, good soil quality and temperate climate.

The efforts of the Romanian economy during the last two decades were aimed at developing a market economy and making it a successful one, in order to diminish the gap in efficiency and competitiveness between it and the other EU member states.

The term "competitiveness" is largely used in the economic literature, and its definition is varying widely. In a general EU definition [EU 1999a], "competitiveness" is "to be able to withstand market competition", while at regional level, it is "the ability of a region to generate, while being exposed to external competition, relatively high income and employment levels". In other words, for a region to be competitive, it is important to "ensure both quality and quantity of jobs" [EU 1999b]. At microeconomic level, "competitiveness" is broadly accepted as a measure of economic viability. In a competitive market, it is "the ability to produce the right goods and services of the right quality, at the right price, at the right time. It means meeting customers' needs more efficiently and more effectively than other firms do" [Thomson and Ward 2005]. At macroeconomic level, OECD defines competitiveness as "the degree to which [a nation]

can, under free and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real income of its people over the long term" [Thomson and Ward 2005]. There are many indices and indicators for evaluating and measuring competitiveness, all of them with strengths and weaknesses; however, the idea of productivity and employment runs like a red thread through more or less all of the concepts of competitiveness, most of all in connection with the living standard of the regional population [Schaller et al. 2012].

The present paper is analyzing the evolution of the Romanian agrifood trade in the last decade, with a focus on the changes post-accession period due to the introduction and changes of CAP.

7.2. Material and method

Calculations for this paper were based on the data extracted from Eurostat database, CN classification - Combined Nomenclature, at 2 and 4 digits level of aggregation (chapters 01-24 covering the agrifood products).

Trade values were analyzed, as well as the directions, composition and ranking of export and import flows by main groups of food products.

7.3. Results and discussions

The national economy went through significant changes during the last two decades: first it went through the economic depression that came along with the structural changes of the transition period to a market economy. Then it had to adapt and refine the new economic mechanisms in order to put an end to the economic decline and restart growth. It achieved that after a whole decade.

General evolutions of the Romanian agrifood trade in the pre-accession period

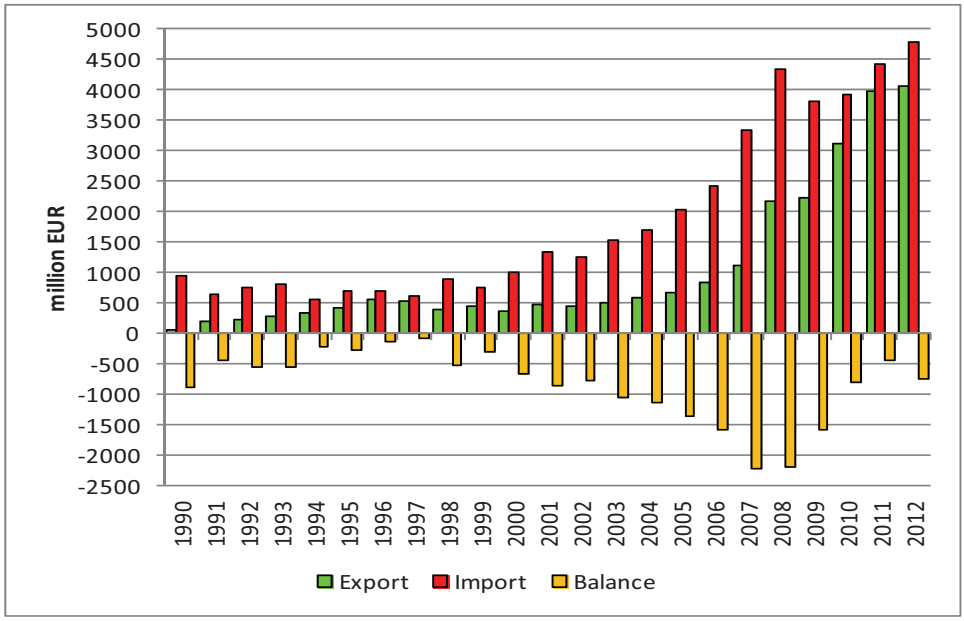
The international trade reflected the economic and political changes. Until 1989, Romania was a net agrifood exporter, but at severe costs to the food security of the population, by forced exports and bans on imports.

In the early 90s, the general evolution trend of the Romanian agrifood trade flows was a massive increase in imports and a drastic decrease of exports – in 1990 the agrifood exports decreased more than six times compared to previous year, while the imports increased more than three times – which resulted in a significant negative trade balance, thus Romania became a net importer of agrifood products.

In 1990-1996, while the trade balance continued to be negative, the trade deficit decreased. After 1998, the trade liberalization effects and CEFTA mem-

bership impacted the agrifood trade evolution by a continuous enlargement of the deficit, which grew during the pre-accession period as well. Although the exports continuously increased, the growth rate of exports was much lower than the growth rate of competitive imports; the general trend of the agrifood trade balance decreased, and in 2003 the trade deficit reached a level comparable to that in 1990. In the years before the accession, record values were reached, 853 million EUR in 2006 for exports, and 2.42 billion EUR for imports, resulting in a trade deficit of 1.57 billion EUR in 2006 (figure 1).

Figure 1. Romanian international agrifood trade



Source: Calculations using Eurostat data.

In the pre-accession period, EU became the main trade partner of Romania; this is shown by the increase of EU share to 61% in the Romanian agri-food exports in 2006 (from 44% in 1999) and to 55% in imports (from 36% in 1999), but also of the deficit (-805 million Euro), to half of the agri-food trade balance.

The main groups of agri-food products that had a positive balance in the pre-accession period were relatively constant, suggesting the presence of competitive advantage for live animals and oilseeds. Cereals are also present in this group, except for the years with extreme unfavorable conditions (very severe drought); these fluctuations, determined by the technological dependence upon the weather conditions, have negative effects upon maintaining the trade part-

ners in time and upon the consolidation of the Romanian exporter position on the world markets.

The main groups of agrifood products that had a negative balance in the pre-accession period, indicating the lack of competitiveness on the foreign markets have been: meat; tobacco; sugar; prepared foodstuffs; fruit; canned vegetables and fruit.

It should be mentioned that certain imported products contributing to the negative balance by over 20% are not produced in Romania (ex.: citrus, bananas, rice, coffee, cocoa, tea, spices, olive and palm oil, pet food etc.).

The main non-competitive products for which Romania has been a net importer had a share over 80% in the (negative) agrifood trade balance and included: pork meat, poultry meat, sugar (cane or sugar beet), tobacco and cigarettes, prepared foodstuffs, coffee, animal feed, bananas and citrus.

The Romanian agri-food trade is characterized by a low level of competitiveness of products with high value added and low diversification of Romanian exports. Compared to the processed products, the basic agricultural products had a high share in exports, accounting for 80% on the average in the period 2003--2006. In the same period, the share of imports of processed products accounted for 42% on the average of total agricultural imports, while the basic products 58%, which reveals the domestic supply deficit with regard to the raw materials and the agri-food industry products [Rusali and Gavrilescu 2008].

Before 1998, which is the year when the foreign direct investments appeared in the Romanian food industry, about two-thirds of the agri-food imports were imports of highly processed products (processed foodstuffs, beverages, tobacco). Their share in imports began to decrease in the subsequent years, reaching 50% in 2000 and 35% in 2004; the decreasing trend continued. These changes in the composition of export flows reveal the positive effect of the foreign direct investments in the Romanian food industry. At the same time, their spill-over effect should be considered: in order to avoid the loss of market segments, the domestic processors had to improve the quality of their products and to increase their efficiency. The improvement of the performance and supply of the Romanian food industry was also stimulated by the explosion of modern retail structures (supermarkets and hypermarkets) after 2000. The investments in farm and agricultural primary processing units through the pre-accession and post-accession programs (such as SAPARD and the Romanian NPRD – National Program for Rural Development) contributed significantly to the increase in agricultural supply in both quantity and quality terms, reflected in the continuous increasing trend of exports since the pre-accession years, and continuing up to the present day.

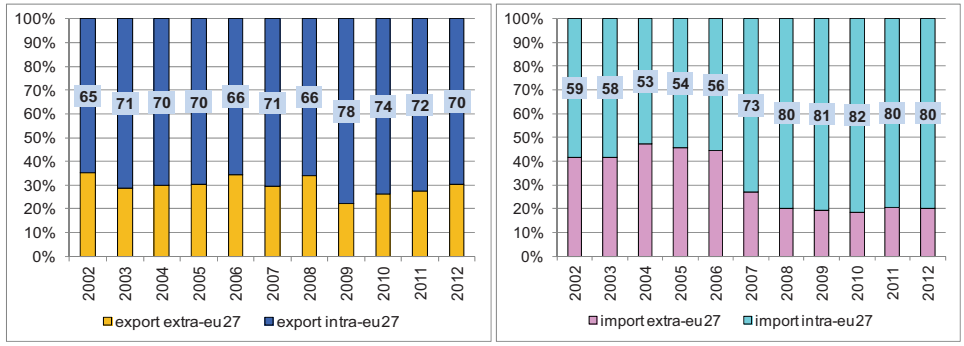
Post-accession trends in the Romanian agrifood trade

After EU accession, the efforts of the Romanian agrifood sector focused on enhancing competitiveness, by improving efficiency and product quality along the food chains, in order to achieve a better presence on both the EU Single Market as well as on the international markets.

EU accession meant for Romania, at least during the first 2 years, a considerable increase in the agrifood total international exchanges; thus in 2008, the total value was double as compared to 2006, the last pre-accession year. The absolute value of the agrifood trade increased both in the pre-accession period, and in the post-accession period, with a slight contraction in 2009. From the agrifood trade point of view, the economic crisis resulted in a contraction of the total trade exchanges in 2009; afterwards, the upward trend resumed.

In the Romanian total international trade, the post accession extra-community trade is about 28% for exports and about 20% for imports. The first 2 years after accession (2007-2008), the Romanian international trade adjusted after entering the Single Market, then, in 2009 the economic crisis hit the economy and changed subsequently the ratios in the trade destinations and origins (figure 2).

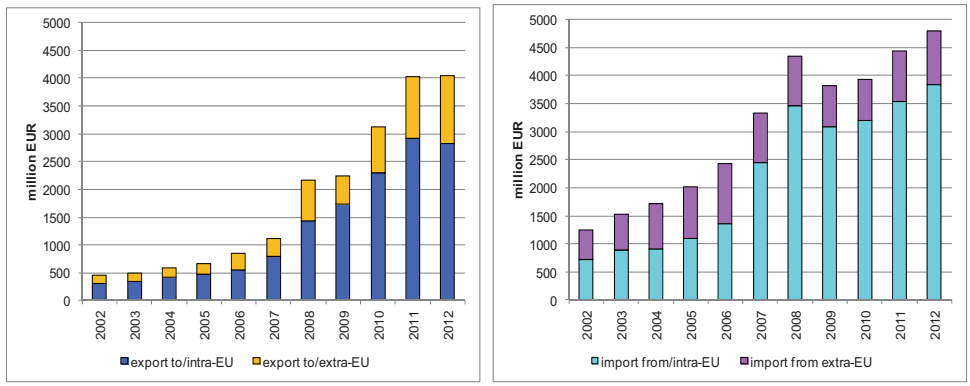
Figure 2. Romania: share of extra- and intra-EU trade in total agrifood trade



Source: Calculations using Eurostat data.

The evolution trends in the Romanian extra-community trade are different from those of the intra-community trade (figure 3). Thus, the extra-community exports increased continuously, reaching a peak in 2011 (1.1 billion EUR), while for imports, the increasing trend from the pre-accession period reversed since 2008, to drop in 2010 to a minimum of 720 million EUR, and then back upward to 903 million EUR in 2011.

Figure 3. Romanian extra-EU versus intra-EU agrifood trade



Source: Calculations on Eurostat data.

The intra-community agrifood trade deficit decreased continuously, the same as for the extra-community balance, due to the combined action of the export expansion and import contraction. The year 2010 is special, because for the first time since 1990, the extra-community agrifood trade balance turned positive: exports exceeded imports, and the trend continued in 2011 as well.

The Romanian extra-community agrifood trade flows are different from those of the EU-27 in terms of the share of destination and origin countries (table 1). It is quite normal, taking into account that:

a) during the '90's, Romania lost some important export markets – the ex-COMECON markets, mainly Russia;
b) penetrating new international markets and EU proved quite difficult, due mainly to sanitary and veterinary barriers;
c) the enforcement of free trade agreements with various countries and country groups facilitated the access of the Romanian agrifood products on these markets;
d) the proximity of these countries allowed the increased of trade flows stimulated by the lower transportation costs as well.

Table 1. The Romanian extra-community agrifood trade: top destinations of exports and origins of imports

Rank	2003		2006		2010	
	Country	%	Country	%	Country	%
Destinations of exports						
1	Croatia	18.1	Turkey	19.6	Turkey	17.3
2	Turkey	16.0	Croatia	14.8	Korea	10.6
3	Syria	14.2	Pakistan	9.2	Syria	6.5
4	Moldova	10.4	Moldova	6.4	Israel	5.5
5	Pakistan	7.9	Russian Fed.	5.2	Saudi Arabia	5.4
6	USA	4.5	Bosnia &Herzegovina	5.1	Philippines	4.9
Origin of imports						
1	Brazil	20.6	Brazil	25.3	Brazil	21.5
2	USA	13.0	USA	12.6	Turkey	15.6
3	Russia	9.3	Turkey	8.5	USA	6.8
4	Turkey	7.5	Canada	7.6	China	6.7
5	Canada	5.6	Moldova	5.3	Argentina	5.7
6	Moldova	5.5	Ecuador	5.0	Moldova	4.4

Source: Calculations on Eurostat data.

The EU accession changed the rules of the game in terms of tariffs and import quotas, but the directional flows remained almost the same, even if in some cases the volume of exchanges decreased somehow (such in the case of Republic of Moldova).

Performances of Romanian agrifood trade in the intra-EU market

In order to evaluate the performance of Romanian agrifood exports, the share of some Romanian products have been calculated in the total Romanian agrifood exports (table 2), as well as in the intra-EU trade (table 3).

There are some Romanian products which "survived" on EU market and among them there are a few agri-food products, as well. At the same time, some Romanian traditional products "disappeared" (more exactly, decreased significantly) in the trade flows.

There are "lost" markets but also "gained" markets, so we wish to determine the "winners" and "losers" of the pre-accession and post-accession period among Romanian agri-food products. Their dynamic evolution on the international market is in close connection with their competitiveness.

If we look at the main Romanian agri-food products exported during the mentioned period, we can identify the "winners", which are products still competitive – which increased their share in both total Romanian agrifood exports (table 2), as well as in the intra-EU trade (table 3).

Table 2. Romanian exports: share of selected products in total agrifood exports (%)

Product	HS code	2003	2006	2007	2008	2009	2010	2011	2012
Cereals	10	2.0	9.8	8.3	6.6	16.3	13.9	12.6	14.2
Wheat	1001	0.4	5.2	2.9	3.2	7.2	5.5	4.9	6.5
Maize	1005	1.6	3.7	4.1	2.6	6.6	6.4	6.4	6.6
Oilseeds	12	10.9	12.8	7.4	18.0	14.2	14.4	15.2	9.3
Sunflower seeds	1206	9.4	8.7	3.5	5.7	4.5	4.5	7.6	6.7
Rapeseeds	1205	0.1	3.4	3.1	11.0	8.9	8.9	6.5	0.9
Soybean seeds	1201	0.4	0.4	0.3	0.4	0.2	0.4	0.5	0.6
Vegetables	07	6.3	3.9	3.7	1.9	1.9	2.0	1.3	1.2
Potatoes	0701	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fruit	08	4.1	3.1	2.4	1.1	1.1	1.4	1.4	1.4
Apples, pears and quinces	0808	0.0	0.0	0.4	0.0	0.1	0.1	0.2	0.1
Live sheep and goats	0104	11.3	7.3	5.8	3.1	3.4	2.3	2.3	1.1
Meat	02	2.4	1.8	2.3	1.9	3.1	3.6	5.1	6.2
Pork	0203	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.7
Poultry meat	0207	1.3	0.0	0.3	0.8	2.2	2.5	3.7	4.1
Honey	0409	4.1	1.9	1.0	0.8	1.3	1.0	0.7	0.8
Sunflower oil	1512	2.4	2.1	2.4	2.0	2.1	3.5	4.4	3.4
Wine	2204	2.8	1.3	0.9	0.5	0.4	0.2	0.2	0.3

Source: Calculations using Eurostat data.

One can we identify two sub-types of "winner" products: active, which have an increasing trend and very good perspectives (competitiveness), such as maize, sunflower seeds, sunflower oil, live sheep and goats; and passive products having a linear evolution under the pressure of various factors (wheat and honey).

Cereals and oilseeds have been an important export product, but the quantities available for export show strong yearly variations, since the domestic product is strongly weather-sensitive (especially to severe draughts). The EU-membership meant for Romania an increased access of these products on the EU market; but for the last 4 years, cereals were exported mostly to non-EU countries.

Romania is in the top 3 sunflower seeds producers in the EU; hence its exports are amounting 15-22% of the intra-EU dispatches.

Rapeseed seems to have a highly fluctuating trend: it peaked significantly in 2008-2010, then, since 2011 became a "loser".

Live animals have been one of the most competitive export products in the Romanian agrifood trade. It intensified since 1995, when the Romania – EU Association Trade Agreement entered into force, and then again in 1997 when, due to the lack of EU-agreed slaughter houses and meat processing units, meat and meat products quotas were transformed in live animals quotas. This trend is expected to decrease in the future, due to the fact that new meat processing units

(EU-certified) entered the market and will process and export more value-added meat products, thus diminishing the exports of live animals.

Table 3. Share of Romanian selected products in intra-EU dispatches (%)

Product	HS code	2003	2006	2007	2008	2009	2010	2011	2012
Cereals	10	0.2	1.2	1.0	1.2	3.7	4.2	3.8	4.0
Wheat	1001	0.1	1.5	0.8	1.3	3.9	3.7	3.4	4.4
Maize	1005	0.5	1.7	1.8	1.9	5.5	7.3	6.7	6.2
Oilseeds	12	1.5	2.7	1.7	5.8	5.5	6.6	7.2	3.8
Sunflower seeds	1206	12.1	16.7	7.7	15.2	13.0	14.8	21.8	17.9
Rapeseeds	1205	0.1	3.3	2.5	10.4	11.6	12.7	9.2	1.1
Soybean seeds	1201	0.4	0.8	0.8	1.5	0.6	1.6	2.6	2.2
Vegetables	07	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3
Potatoes	0701	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
Fruit	08	0.2	0.2	0.2	0.1	0.1	0.3	0.3	0.3
Apples, pears and quinces	0808	0.0	0.0	0.2	0.0	0.1	0.2	0.4	0.2
Live sheep and goats	0104	29.7	25.3	26.5	32.4	33.7	32.0	36.5	22.9
Meat	02	0.1	0.1	0.1	0.1	0.3	0.4	0.6	0.7
Pork	0203	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3
Poultry meat	0207	0.2	0.0	0.1	0.3	1.0	1.5	2.4	2.6
Honey	0409	9.2	8.5	5.3	5.8	10.1	9.4	8.4	8.4
Sunflower oil	1512	2.3	2.7	2.8	2.7	4.0	8.1	8.7	6.3
Wine	2204	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Source: Calculations using Eurostat data.

The main "losers" in the Romanian agrifood trade are: pork, chicken meat, apples and wine.

In 1990, the share of pork in Romanian agrifood exports was 21%; it decreased to 12.5% in 1995 and dropped to zero in 1997-2008 [Voicilaş 2013]. A similar trend we find in chicken meat: in 1991 its share in exports was about 18%, it decreased to 7% in 1995 and dropped to zero in 1997-2002. The reason for it is that until 1996, pigs and poultry were grown in huge state-owned enterprises, which became bankrupt over the years and were dismantled in 1997. Recovery of pig and poultry husbandry in new private farms started immediately, but was slow and difficult. The investment efforts were important, but the new production had to face as well huge competition from CEFTA and (after 2003) EU countries (such as Hungary and Poland) which penetrated immediately the Romanian markets and made even more difficult for the Romanian producers to regain the lost domestic market, let alone foreign markets. Only in the latest years these two products appeared again in the list of export products; chicken meat seems to do better. Pork exports to the EU were also banned until end 2013

for veterinary reasons, while Russia banned Romanian exports of meat and meat products since 2009.

Apples (+pears and quinces) are another big "loser" of the Romanian agrifood trade. In 1990 they had a share of 4.5% in exports, decreased to 1.9% in 1995 and dropped to almost zero in subsequent years until 2006. Some reasons might be: a drop in the domestic production starting 1998, due to the dismantling of the state farms (which included almost half of the orchard areas) and trade liberalization which allowed higher imports at low prices. The new private fruit farms needed time to start producing efficiently in a market environment. Moreover, there were no fruit producers associations (they started establishing quite recently), and for that reason the big retailers choose to import fruit rather than use the domestic fragmented supply.

The lack of supply domestic organization is the main hindrance for vegetables exports. The same reason and the preference of big retailers for cheap vegetables imported from Turkey, together with important fiscal evasion in this area are the main reasons for which imports of vegetables increased, resulting in the fact that Romania is a net importer in both fruit and vegetables.

The Romanian wine had a share of about 7% in the agrifood exports in 1990-2000. It dropped subsequently to almost zero. The restructuration of wineries was slow and costly, since it involved important technological investments, together with investment in new high quality vineyards able to supply high quality grapes. The domestic wine production is mostly consumed domestically, some surpluses are exported to Russia and Moldova. High quality Romanian wines are slowly penetrating the EU market, since competition is strong for this product.

7.4. Conclusions

The EU-27 has a leading position in the total agrifood world trade. The last two enlargements (in 2004 and 2007) had a significant impact on the EU trade. The value increased in real terms, mostly due to the contribution of the NMS, through the increase in the traded goods volumes. But the NMS added as well their negative extra-community agrifood trade balances to that of the OMS, thus contributing temporarily to the increasing EU-27 trade deficit. Overall, the final result of the latest EU enlargements has been positive in the extra-community trade volume, and after the passing of the economic crisis shock, exports increased faster than imports, resulting in a diminished trade deficit from 24 million EUR in 2008 down to 4.5 billion EUR in 2012. The shock was even smaller in intra-EU trade: total dispatches diminished by 5.7% in 2009/2008, but immediately recovered in 2010 (+8% as compared to 2009).

The absolute value of the Romanian international agrifood trade increased continuously during the last decade. The intra-community trade accounted for 73% for the last three years.

As a result of the simultaneous action of the export expansion and import contraction after 2008, the Romanian extra and intra-community agrifood trade balance trade diminished continuously, from the historical maximum of 1.65 billion EUR in 2007 down to 631.6 million in 2011. As a first since 1990, the extra-community agrifood trade balance became positive in 2010: the exports exceeded the imports, and the trend continued in 2011 and 2012 as well.

The analysis of individual Romanian agrifood products performance in the intra-EU market allowed the grouping of those products in three categories: "active winners" (showing an increasing trend and good competitiveness), "passive winners" (showing a linear evolution under the pressure of various factors) and "losers".

The identified active winners are maize, sunflower seeds, sunflower oil, live sheep and goats. The identified passive winners are wheat and honey. The identified losers are pork, chicken meat, apples and wine.

Various domestic and external factors had implications on the performance of all the analyzed products: privatization, state farms bankruptcy, enforcement of the EU pre-accession trade agreement, CEFTA membership, foreign and domestic investments, the pre-accession support programs (SAPARD), the post-accession NPRD. The EU accession had a direct positive impact on the Romanian agrifood trade by the free access on the Single Market. There is as well an important indirect impact, through the application of CAP which resulted after the first 6 years in higher and better quality agrifood domestic supply, as basis for increased competitiveness of Romanian products, resulting in increased exports on both EU and non-EU markets.

Acknowledgements

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References

1. Gavrilescu C., (2013), *Recent trends in the Romanian agrifood trade with Hungary*, Scientific Papers - Agricultural Management, series I, vol. XV(1), Timişoara, pp.177.
2. European Commission, (1999a), *Territorial competitiveness - Creating a territorial development strategy in light of the LEADER experience*, "Rural Innovation" Dossier n° 6 - LEADER European Observatory, December 1999, from http://ec.europa.eu/agriculture/rur/leader2/rural-en/biblio/compet /intro.htm.
3. European Commission, (1999b), *Sixth Periodic Report on the Social and Economic Situation of Regions in the EU*, 1999.
4. Rusali M., Gavrilescu C., (2008), *Romanian agricultural products' competitive advantages and disadvantages in the external commercial relations*, Scientific Papers - Agricultural Management, series I, vol. X(1), Timişoara, pp. 26.
5. Thomson N., Ward N., (2005), *Rural Areas and Regional Competitiveness* (Report to Local Government Rural Network), Centre for Rural Economy Research (ISBN 1-903964-23-7).
6. Schaller L., Kapfer M., Kantelhardt J., Van Zanten B., Verburg P., (2012), *Landscape as a driver for competitiveness* (FP 7 Project no. 289578-Claim "Supporting the role of the Common Aagricultural Policy in Landscape valorization: Improving the knowledge base of the contribution of landscape management to the rural economy", Deliverable D3.14), Amsterdam, Lead beneficiary VU-IVM.
7. Voicilaş M., *Gains and loses of Romanian agri-food products on EU intra-trade market*, paper presented at the 2-nd International Conference "Competitiveness of agrofood and environmental economy", Bucharest, University of Economic Studies, November 2013 (under publication).

II. The new Common Agricultural Policy - sustainability and socio-environmental goals

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1. Financial aspects of sustainability of agriculture

1.1. Introduction

One of the most actual problems arising from economic development and civilization is pollution and adverse social changes that lead to the inefficient use of resources. Therefore, it appears necessary to make changes in existing patterns of consumption and production. The need to solve or at least mitigate the external effects also applies to agriculture. Hence in the agricultural policy, the European Union increasingly stresses the issue of sustainable development as a response to the growing environmental and civilization hazards.

The purpose of this article is to attempt to indicate the correlation between finances and balancing agriculture. To implement this aim, the following working hypotheses were adopted:

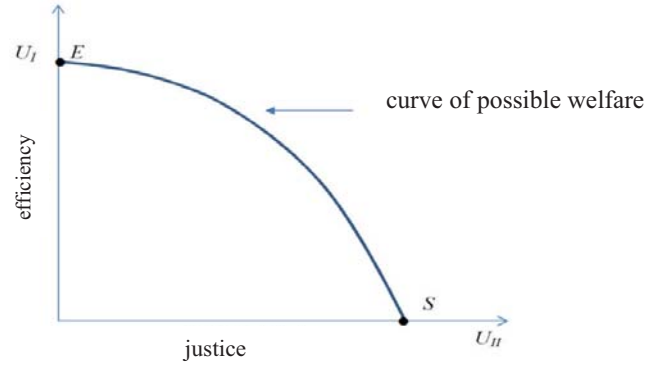
- the impact of finance on the sustainability of agriculture is often overrated, largely because the same financial instruments rarely form a coherent system of incentives and anti-incentives,
- in agriculture it is possible to loosen the connection between its balancing and subsidies.

The studies conducted are theoretical considerations and contribute to further analysis.

1.2. Taxation vs. efficiency and justice

A tool that determines the behaviour of the operators on the market and that can be used to achieve the objectives of sustainable development is the tax system. One of the main issues of taxation is the issue of substitutability between economic efficiency and justice. This means that if we want to have a more equitable taxation, this must be done at the expense of efficiency, and thus also at the expense of social welfare. The interdependence is presented by Figure 1.

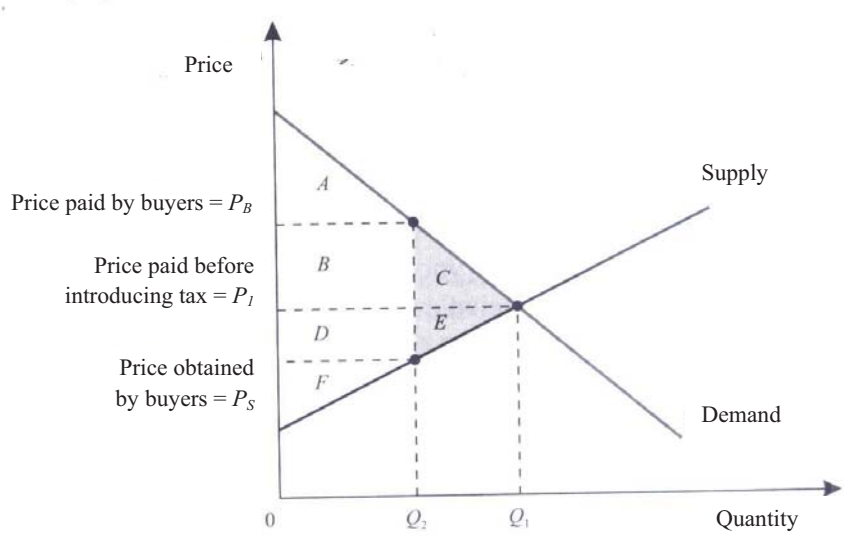
Figure 1. The curve of trade-offs between economic efficiency and justice



Source: [Grądalski 2004, p. 36].

The effect of the imposition of taxes is a loss of prosperity, which means a loss in total excess as a result of limitations on the size of the market below the optimum one. Figure 2 shows the impact of taxation on wealth.

Figure 2. The loss of welfare caused by taxes



Source: Own elaboration on the basis of [Mankiw, Taylor 2009].

The imposition of a tax will cause market imbalance and the emergence of the loss of prosperity (CE field), often known as useless effect of taxation. This is because taxation usually raises the price for the consumer (from P_1 to P_B) and

lowers the price for the producer (from P_1 to P_S). From an economic point of view, there appears to be the real cost that is based on the decline in the level of sales from Q_1 to Q_2, which in turn translates to reducing the level of prosperity. The loss of welfare will be higher, when the burden on the market is more. This means that any imposition of a tax is perceived as an inefficient use of resources.

1.3. The instruments of sustainable agriculture – selected categories

There are many ways and methods to foster the implementation of the concept of sustainable development. In the literature of the subject there is a variety of their classifications. For the purpose of this work, these instruments were divided into: financial (taxes and subsidies) and market and non-market among which organizational tools occupy a special place (e.g., optimization of the production) as well as institutional (e.g. "environmental agent").

Governments are trying to design tax systems so as to get the most revenue and at the same time not violate social stability and security. Hence, agricultural tax systems are composed of a number of different taxes, which guarantees a large share of citizens in the financing of the states' tasks (table 1).

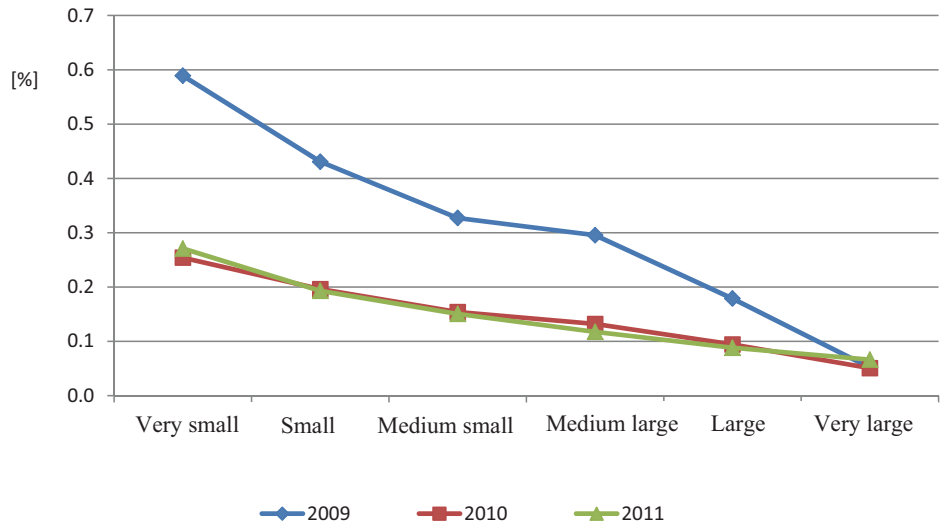
Table 1. Basic types of taxes in the agricultural sector in selected countries of the EU and the USA

Types of taxes	France	Italy	England	Ireland	Germany	USA	Poland
Income tax	+	+	+	+	+	+	+
Corporate tax	+	+	+	+	+	+	+
Property tax	+	-	+	+	-[aa]	-	+
Land tax	+	-[a]	-	-	+	-	-
Local taxes (with the exception of land, including agricultural tax)	+	+	-	-	+	+	+
VAT	+	+	+	+	+	-	+
Sales tax	-	-	-	-	-	+	-
Social contributions	+	+	+	+	+	+	+

Explanation: [a] - included in the income tax; [aa] - included in the land tax.
Source: Own elaboration on the basis of [Dziemianowicz 2007].

In some countries, to minimize the loss of welfare, preferential tax arrangements are introduced. Such systems have developed, especially in those countries where the structure is dominated by small production units, for example in France, Germany, Italy and Poland. As Dziemianowicz notes however [2007], such solutions are typically inefficient and often lead to abuse both within the sector, as well as in cross-sector transactions. An example of preferential solutions used in Polish agriculture is agricultural tax. Revenue load for this tax decreases with increased economic strength (Figure 3), which means that the greatest loss of welfare is suffered by the poorest farms. This situation indicates that the tax structure is not only inefficient, but above all internally unfair.

Figure 3. The burden of the family farm taxes, broken down by ESU groups in the years 2009-2011



Source: *Own work on the basis of FADN data 2009-2011.*

Tax solution presented does not stimulate the activities aimed at the sustainable development of farms. Sometimes, however, taxes may have a positive impact and contribute to improving the efficiency. These tools can be used in the concept of sustainable development in order to reduce the external effects (table 2). Examples of such solutions may be taxes on quantities sold, junk food or salary fund. The positive effect of their use may be reducing the production and consumption of goods which are heavily burdened by external costs, reducing loss of welfare, transition into new environment-friendly technologies, the crea-

tion of new patterns of consumption and production, increasing the propensity to save, efficient use of resources. It seems that the importance of these taxes will increase in the financial instruments.

Table 2. "New" taxes on efficiency and justice

Type of tax	Effectiveness of taxation (economic, social and ecological effectiveness)	Justice
Tax on amount sold	• Temporary loss of revenue, • Diversification of income of the population, • Reduction in the number of jobs among the employed, • Reduction of salaries, • The quantity of goods placed on the market limited by the amount of tax - possibility of using agricultural land for environmental objectives.	Difficult to determine dependent on marginal utility
A tax on "junk food"	• Reducing the supply of taxable goods, • A change in the patterns of production, • Temporarily reduction in the company's revenue, • Short-term changes in the structure of employment and remuneration, • Positive impact on the NPK balance, • Transition to effective environmental-friendly technologies (extensive production), • Raising food safety (product quality, GMP, GHP).	Difficult to determine dependent on marginal utility
Wage tax	• Does not affect wages after tax, and thus the loss of welfare, • May cause employment migration of workers and regional variation in wages.	Is seen as fair

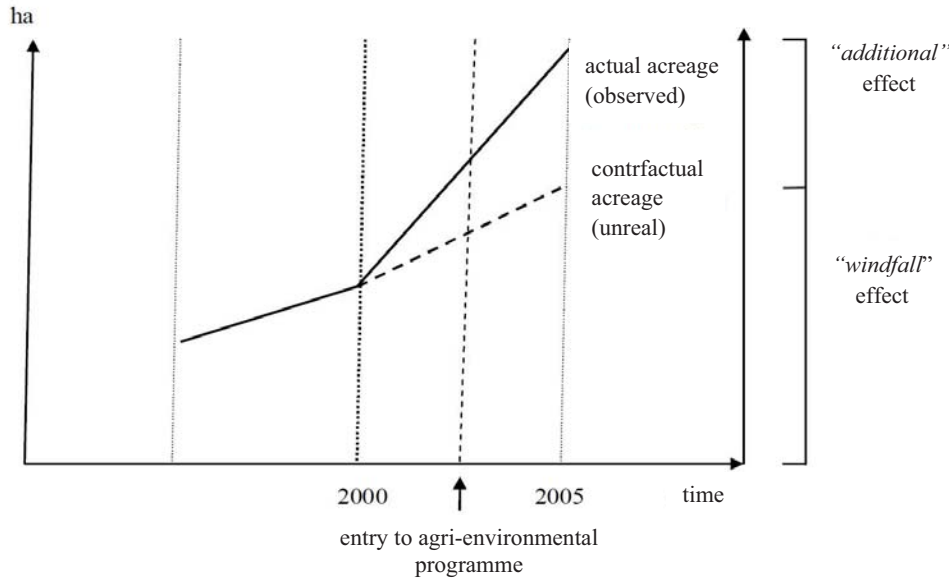
Source: Own elaboration.

In the EU and in many other OECD countries encouraging producers to supply public goods and to internalise external costs is carried out by means of subsidies. However, there is the problem of adequate subsidies for farmers for the delivery of public goods and internalisation of externalities. Figure 4 shows the impact of subsidies on greening action.

A solid line is the equivalent of agricultural land area covered by the agri-environmental commitment. Whereas the dotted line means potential obligation, which means that some farmers would behave as if they realised agri-environmental projects. Two effects follow this:

- *Additional* - value added generated by the implementation of commitment,
- *Windfall* - extraordinary, unexpected income.

Figure 4. “Additional" and "windfall” effect in agri-environmental programmes



Source: [Chabé-Ferret, Subervie 2012].

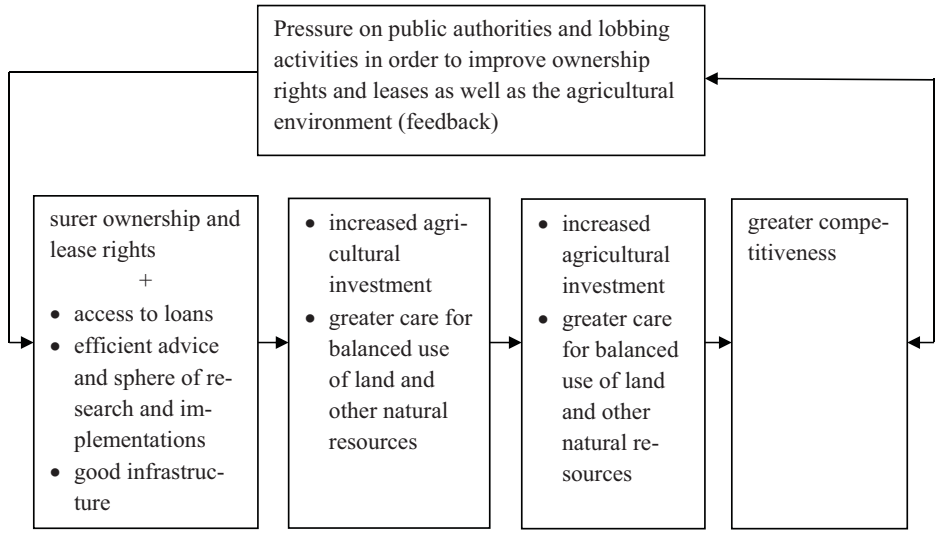
The farmer should actually be paid from the budget for achieving the additional effect. It can be assumed that the actions aimed at non-financial support, i.e., agricultural education, advice on the use of environment-friendly techniques, innovations in farms, can give better results than the support in the form of aid.

1.4. Market and non-market mitigation instruments for externalities

Practice shows that there are many ways to improve the efficiency of farms without the use of financial instruments, which means that you can reconcile economic objectives with the objectives of environmental considerations. This is about, among other things, traditional methods of crop and livestock production in accordance with agri-environmental programmes, i.e. observance of the principles of proper selection and succession of plants, reduction of weeds and limiting the growth of nitrogen in the soil. German research [Karpenstein-Machan et al. 2013] on optimizing and using forecrops and cover crops before and their impact on the results of farming suggests that appropriate selection of plants in crop structure and suitable rotation can clearly affect the improvement of direct surplus in farms.

In addition to the optimization in farms, we can use other ways to mitigate the effects of negative externalities. Figure 5 indicates that strengthening property rights alone can lead to improved competitiveness and further sustainability of agriculture.

Figure 5. To ensure ownership and leases and the operation of a competitive and sustainable agriculture

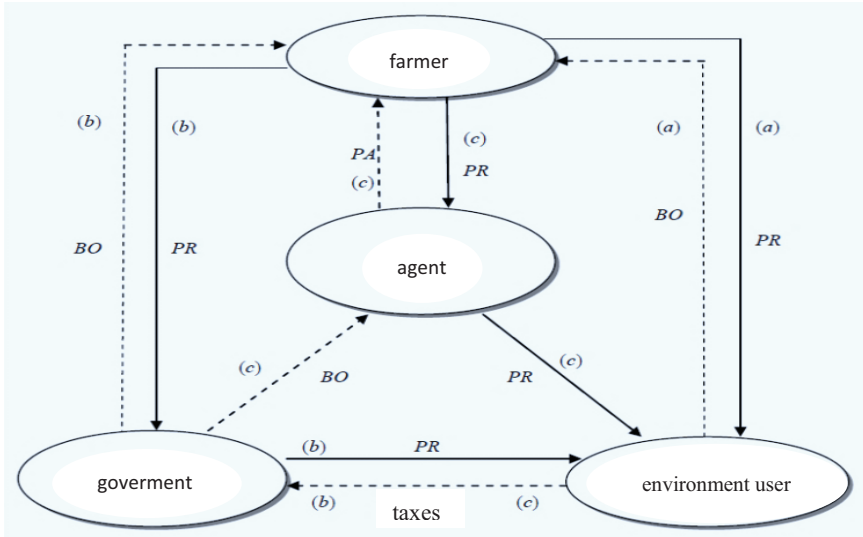


Source: Own elaboration.

There are various institutional and organisational solutions in agri-environmental programmes. Quite interesting is the system in which the environmental agent exists. Figure 6 shows the link of this agent with other actors within the framework of agri-environmental programmes. We can see that the transfer of ownership occurs between the farmer and environment user. In turn, government provide a subsidy to the agent, which he uses to pay the farmer to ensure environmental principles.

The main prerequisite for the introduction of environmental agents is the problem of high transactional costs due to enforcement of contracts between the users and farmers. The agreements between the government (or government agency) and farmers entail certain difficulties: (i) emotional involvement of the farmer in a traditional, intensive agricultural activity, (ii) restriction of the farmer's interests to own farm, (iii) lack of expertise, as well as holistic treatment of the problem of public goods supplied to the general public (including "non-agricultural" means to produce public goods).

Figure 6. "Environmental Agent" as a participant in agreements of agro-environmental programmes



Source: Own work on the basis of [Lippert et al. 1997, s. 6].

Environmental agents can take advantage of economies of scale covering the entire landscape with their activities. In addition, the agent transfers the necessary know-how to the farmer for production of public goods. Thanks to the agents, activities under agro-environmental programmes can be targeted to the needs of the area. An "environmental agent" could acquire the know-how to deliver public goods at low cost with low opportunity cost and would motivate farmers to use environment-friendly technology

We should also bear in mind the potential problems associated with the introduction of the "environmental agents", namely difficulties in defining and measuring the amount of public goods that the farmer should provide. It is also worth highlighting potential conflicts associated with objectives concerning income distribution and breach of the principle of "polluter pays" principle [Lippert et al. 1997].

In Europe there is a growing interest in a variety of collective activities in the agri-environmental programmes, which was noted in particular in the studies of Dutch agriculture economists. Collective action can help deliver green services, which is associated with high levels of investment. Hybrid management structure help reduce the transactional cost both for the State regulator as well as for farmers. In practice, the Netherlands has environmental associations; in fact,

these are entities in the form of associations. This is confirmed by research by Polman's team [2011], from which it follows that the main rationale for collective actions include: the necessity of aggregating assets at the disposal of many farmers in order to achieve the interim environmental objectives (e.g. maintenance of the regional landscape), delivering "green services" requires specific investments, whose scale usually exceeds the capacity of a single financial stakeholder.

1.5. Conclusions

We need to take seriously all the signals that in the future there will be a reduction of subsidies to agriculture, which will need to be spent in a more thoughtful, more efficient and more targeted way. Already now there is a lot of institutional and quasi-market solutions which make "looser" the link between subsidies and internalisation of externalities in agriculture and the provision of public goods by this sector.

Replacing the traditional tax tools with "new" solutions will require deliberate changes at the level of whole tax system organization so as not to reduce the social welfare state in agriculture and society.

We can anticipate that there will be growth in dissemination of market-based and non-market instruments of environmental policy also in the agricultural sector.

Institutional arrangements, in particular, the "environmental agents" can be adopted as a tool for the sustainable development of rural areas.

References

1. Chabé-Ferret S., Subervie J., (2012), *Econometric Methods for Estimating the Additional Effects of Agro-Environmental Schemes on Farmers' Practices* [in:] Evaluation of Agri-Environmental Policies: Selected Methodological Issues and Case Studies, Burrell A. (eds.), OECD, Paris.
2. Dziemianowicz R.I., (2007), *Efektywność systemu opodatkowania rolnictwa*, Wydawnictwo Uniwersytetu w Białymstoku, Białystok.
3. Grądalski F., (2004), Wstęp do teorii opodatkowania, Oficyna Wydawnicza SGH, Warsaw.
4. Lippert, C., Ahrens H., Rittershofer M., (1997), *The Significance of Institutions for the Design and Formation of Agro-Environmental Policy*, Volkswirtschaftliche Diskussionsbeiträge 8. Martin-Luther-University Halle, Wittenberg, Halle.

5. Karpenstein-Machan M., Zimmermann T., Musshoff O., (2013), *Ökonomische und pflanzenbauliche Optimierung des Anbaus von Nahrungs-, Futter- und Energiepflanzen mit Unterstützung eines Linearen Programmierungsmodells*, Berichte über Landwirtschaft, Bd. 91, Heft 1.
6. Mankiw N. G., Taylor M. P., (2009), *Mikroekonomia*, PWE, Warszawa.
7. Polman N., Slangen L., von Huylenbroeck (2011), *Collective approaches to agri-environmental problems*, [in:] EU Policy for agriculture, food and rural areas, Oskam A., Meester G., Silvis H. (eds.), Wageningen Academic Publishers, Wageningen.

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2. Changes in the socio-demographic structure of villagers and employment in individual agriculture

2.1. Introduction

One of the primary determinants of the multifunctional rural development is to improve the quality of human capital. It is a prerequisite for running a positive transformation processes in the agricultural sector and in rural areas, including in the structure of those working in the agricultural sector and outside it[22]. Structural deficit in non-agricultural jobs in rural areas causes an excess of labour burdening farms and inhibiting concentration processes in agriculture[23]. Hidden unemployment in agriculture and non-agricultural population unemployment are fundamental determinants of chronic imbalances in the local labour market, shaped by differences in labour supply and demand[24].

In this study the focus was mainly on issues relating to:

- changes in the number and socio-demographic characteristics of the rural population,
- socio-demographic characteristics of persons in charge of individual farms,
- employment & labour in agriculture, their diversity and the factors affecting them.

This work uses the results of the field studies carried out periodically by the IAFE-NRI on a permanent sample of rural households from 76 villages, mainly from the years 2000, 2005 and 2011. Villages to be studied were chosen deliberately so that they reflected the actual socio-economic characteristics of rural areas, and especially the area structure of individual farms. The survey covered of the households in the villages, including the farms with an area of more than 1 ha of agricultural land at the disposal of individuals. The villages were intentionally selected in such a way so as to ensure that the size of exam-

[22] Cf. G. S. Becker, Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education, University of Chicago Press, Chicago, 1993, p.25.
[23] A. Sikorska, Zmiany strukturalne na wsi i w rolnictwie w latach 1996-2000 a wielofunkcyjny rozwój obszarów wiejskich. Synteza. IERiGŻ, Warsaw 2001, p. 44-45.
[24] cf. International Encyclopedia of Social Policy, ed. T. Fitzpatrick, H. Kwon, N. Manning, J. Midgley, G., Pascall, Routledge, 2006, p. 586-588.

ined farms is proportional to the factual area structure, both at the country scale and in spatial terms[25]. Surveyed units accounted for about 1/500 of the actual number of households, and their numbers in the last two surveys were as follows: in 2005 – 3705, and in 2011 – 3331 units.

The empirical material from field studies was supplemented by the CSO data, including:

- Agricultural census in 2002 and 2010;
- Population and housing census between 2002 and 2011;
- Study of Economic Activity.

2.2. The numbers and socio-economic structure for rural population

According to COS, rural areas represent 39.2% of the population of the country. Compared to 2002, the population increased by 3.3% (486,2 thousand persons). Despite the increase in the absolute number of the rural population and the decrease of 0.9% of the urban population, the share of population living in rural areas among all our citizens increased only by 1 percentage point.

Table 1. The status and structure of the population according to age groups between 2002 and 2011

Description	Year	Total	Population		
			Pre-working age	Working age	Post-working age
Number of people in thousand					
Rural areas (rural)	2002	14 619.7	3 876.5	8 456.0	2 286.7
	2011	15 105.9	3 226.4	9 539.1	2 340.4
City (urban)	2002	23 610.4	4 974.2	15 169.8	3 462.4
	2011	23 405.9	3 975.9	15 258.3	4 171.4
The dynamics of changes (2002 = 100)					
Village (rural)		103.3	83.2	112.8	102.3
City (urban)		99.1	79.9	100.6	120.5

** CSO economic age groups were used:* ***pre-working age*** *-a person up to 17 years;* ***working age*** *women aged 18-59 years and men aged 18-64 years;* ***post-working age*** *women aged 60 and over and men aged 65 or more. In the* ***post working age*** *two more groups were identified:* ***mobile (junior working age) -*** *people aged 18-44 years and* ***non-mobile*** *(senior working age) -women aged 45-59 years and men aged 45-64 years.*

Source: Author's own compilation based on the data of the Central Statistical Office.

[25] A. Sikorska: *Procesy przekształceń strukturalnych w wiejskiej społeczności i chłopskim rolnictwie. Synteza,* IERiGŻ-PIB, Warsaw 2013.

From the perspective of the impact of demographic considerations on the economic situation of rural areas, what is important are the changes in the trend of population structure by age, and, above all, the relationship between the number of people of working and non-working age. They allow the assessment of the aging process. In the years 2002-2011, there were significant changes in terms of size and structure of the rural population according to economic age groups. This was a consequence (as with the urban population) of population movement to the next age groups at the time of demographic booms and lows.

In the years 2002-2011 the number of working age rural population declined by about 16.8% and the share from 26.5 to 21.4%. During the analyzed period the number of urban population in this age decreased by 20,1% and accounted for 44.8% of the total population in this age group (in 2002 – 43.8%).

An aggregation of rural population in the working age increased by 12.8%, while in the cities only 0.6%. As a consequence, 2011 38,5% of the working age population lived in the countryside, while in 2002 it was 35.8%

In 2011, post-working age people from the countryside represented 35,9% of this population in the country. It was a group which was relatively stable in numbers (in the years 2002-2011 increased by only 2.3%) and the increase accounted in total for only 7% of the total population increase at the retirement age in the country. As a result, the demographic burden factor for rural population amounted in 2011 to 58 and was about 15 people less than in 2002. Despite the relatively large decline, this was a value of about 5 percentage points higher than among the rural population.

In the present context, human capital is increasingly important in shaping urban development processes in the economy, and education of the population plays an increasingly important role both at the level of the general change in the countryside, as well as in the socio-economic situation of individuals, especially with regard to their position in the labour market and the outcomes achieved thanks to their professional activity[26].

A positive phenomenon observed over the years is the systematic increase in the educational level of rural residents. However, despite much progress in this area, the structure and level of education of the rural population is still significantly different from that recorded in cities (Table 2). Among the villagers, the predominant type of education is still primary education – in 2011 at 31,6% (2002 – 38.3%). Among the urban population it was secondary education, and the percentage was at 35.2% in 2011 (in 2002 – 38,5%).

[26] D. Checchi, C. Lucifora, Education, Training and Labour Market Outcomes in Europe, Palgrave Macmillan, 2004, p. 12-13.

Table 2. The level of education of the population (aged 13 years and over)

Years	Percentage of people with			
	University education	Secondary and post-secondary	Vocational (college)	Lower secondary and primary
Rural areas				
2002	4.3	22.4	29.2	38.3
2011	9.9	25.5	26.6	31.6
City				
2002	13.7	38.5	21.1	22.2
2011	21.3	35.2	19.0	17.9

Source: Compiled on the basis of the data of CSO.

A measure of progress in the level of education is, *inter alia*, the increase in the population having at least secondary education. In the years 2002-2011 the proportion of those with at least secondary education in rural areas increased from 26.7 to 35.4%, but was still a 21 pp. lower than amongst the urban residents. The largest increase was noted in respect of people with higher education, whose share more than doubled and in 2011 amounted to almost 10%. Despite such large dynamics of positive change, still the percentage of people with higher education in rural areas is more than twice lower than in urban areas. In turn, it is worth noting that obviously more villagers than city dwellers have vocational education (26.6% compared to 19%).

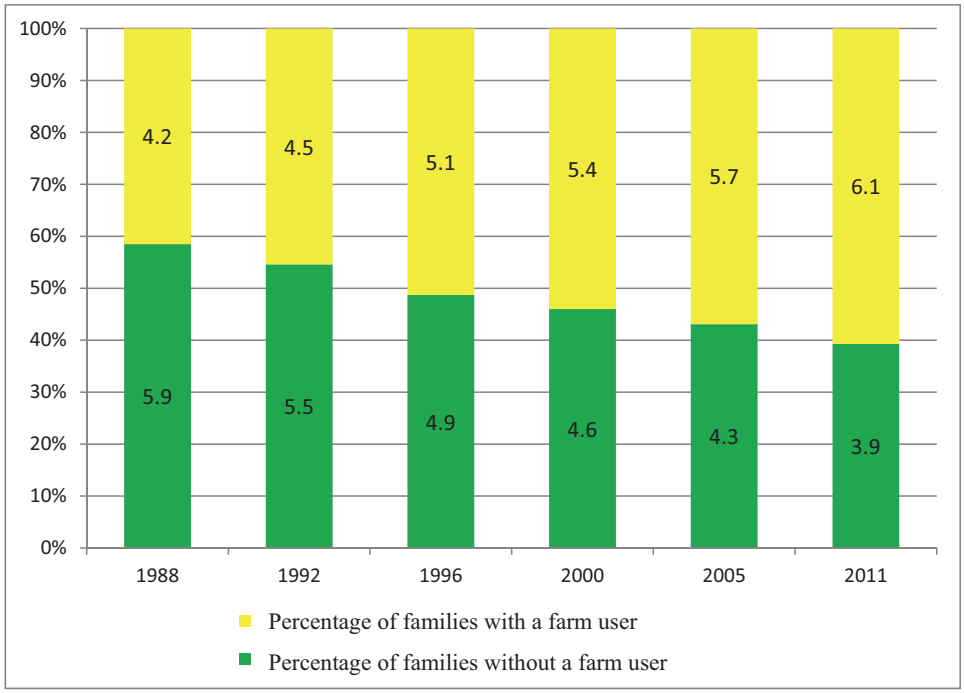
According to the study of economic activity of the population, an aggregation of economically active rural population aged 15 years or more at the end of 2012 represented more than 56% of the total rural population in this age group with a set status on the labour market. Every other person was employed, as indicated by the employment rate at 50.8%. At the same time, every tenth actively working person had difficulty in finding work (the unemployment rate is 10.0%). If we confine professional activity to people in the working age, which should be considered a more appropriate approach from the perspective of the difficulty in finding employment, this work was held by 65.4% of the population in villages at the legal professional activity age and it was an indicator which was 0.5 pp. lower than with urban population. In the case of total rural population, the level of their economic activity, minimally although regularly increases, and falls among city dwellers. As a consequence, these two groups are becoming similar at this level.

One of the processes affecting economic activity in the rural population and its activity on the labour market are the developments in the size and struc-

ture of farms. The progressive deagrarization of the Polish countryside[27], is reflected both in preferences of education profiles for rural population, constantly declining number of persons employed in agricultural activities and the work time of those persons. This situation results in the release of the labour force resources to non-agricultural sectors of the economy.

The aforementioned increase in the number of people living in rural areas is accompanied by a process of reduction of the population related to individuals farm users (Figure 1).

Figure 1. Farm and non-farm families in the socio-economic structure of villages covered by IAFE-NRI research



Source: IERiGŻ-PIB survey, 1988, 1992, 1996, 2000, 2005 and 2011.

The IERiGŻ-PIB research reveals that in the rural population, the percentage of families related to farming have shown systematic growth for years. As a result, in the sample of rural households surveyed in 2011 the share of landless families; i.e. which do not have land or using plots with an area not exceeding 1 ha, accounted for nearly 61% of the total and was about 3 percentage points

[27] cf. A Sikorska: *Zmiany w wielkości badanych wsi oraz mobilność rodzin* [in:] *Przemiany strukturalne we wsiach objętych badaniem IERiGŻ w latach 1996-2000*, IERiGŻ, Warszawa 2001, p. 13.

(pp.) more than six years earlier (Figure 1). Thus, in relation to the period before the transition the share of families not using individual farms in the tested population of rural families increased by nearly 20 pp. The primary determinant of this process was for the rural population to abandon agricultural activities and its professional activation in other sectors of the economy, as well as ceasing agricultural production activities due to retirement age[28]. It is worth noting that, at present, population not related with farm user is increasingly a factor helping to form structures in the process of rural development[29].

The processes of deagrarization in the Polish villages is not only seen in changes in population size of families with a farm user, but also in a reduction in the number of family members employed in agricultural activities and changes in terms of their involvement in the work on the farm. Transformations within the family labour force are related to, inter alia, the attitude of farm manager which, in turn, is influenced by socio-demographic characteristics.

2.3. Changes in employment and the labour cost in individual farms

A reflection of the process of diversification in professional activity of the farming population is systematic reduction of share of people contributing their labour to a farm among the general working individuals. Reduction in the number of farm workers has a constant character, but before 2000 these changes were minimal and their share was at 96-98%. In the first decade of the 21st century there was an acceleration in the pace at which the share of persons working on the holding among the public and in 2011 it was only 87%. The scale of the change in this regard is best reflected by the fact that the annual average decline of those employed on the farm during the period 2000-2011 was 0.8%, while previously it was nearly 4 times smaller. A reduction was seen not only in the population working on the farm, but also the extent of their involvement in its activities. In the years 2000-2011 population working on the farm full-time decreased from 47.3 to 39.9%, but above all there was an increase in the number of those working only on a temporary basis; i.e. seasonally and casually (14.0 to 26.8%). As a result, in 2011 a farm gave the possibility of permanent full-time employment for significantly less than half of the people who were exclusively or mainly employed on it.

[28] B. Karwat-Woźniak, A. Sikorska: Migracje ludności wiejskiej w latach 2005-2011, IERiGŻ-PIB, Warsaw 2013, p. 50-51.
[29] Cf. A. Sikorska, Procesy przekształceń strukturalnych w wiejskiej społeczności i chłopskim rolnictwie. Synteza, IERiGŻ-PIB, Warsaw 2013.

Due to the large diversity in the involvement of individuals, especially members of the rural family in the work on the farm, labour in farming activities is expressed as full-time equivalent (FTE)[30].

Table 3. Amount of work on the farm provided by farming family members according to area groups

Description	Annual work units (FWU)					
	per one farm			per 100 ha of agricultural land		
	2005	2011	Rate of change (2005 = 100)	2005	2011	Rate of change (2005 = 100)
Total	1.13	0.93	82.3	11.8	9.7	82.2
Area groups (ha AL)						
1-5	0.82	0.61	74.4	32,8	24.3	74.1
5-10	1.18	1.00	84.7	16.7	14.2	85.0
10-15	1.40	1.28	91.4	11.8	10.7	90.7
15-20	1.56	1.32	84.6	9.2	7.8	84.8
20-30	1.65	1.42	86,1	6.9	5.9	85.5
30-50	1.81	1.68	92,8	4.9	4.5	91.8
50 and over	1.66	1.67	100.6	1.7	1.7	100.0

Source: IERiGŻ-PIB survey 2005 and 2011.

The work carried out shows that the 2005-2011 was a period of decline in labour per farm. In this period, expenditure decreased by almost 18% (from 1.13 to 0,93 full-time employed person), and per 100 ha of agricultural land about almost 20% (from 11.8 to 9.5 per 100 ha of agricultural land). It was not a new trend. It already appeared in previous periods covered by field research activities[31]. Although the pace of these changes was different in each separate research periods, it can be concluded that it clearly took the momentum when the processes of adapting our economy to EU structures became more advanced.

Among the causes of these changes we can indicate on a number of factors, both exogenous and endogenous . The most important include: overall improvement to the economic situation and the improvement of the situation in the

[30] In Poland, this is equivalent to the situation when a full-time employee works 2120 hours during the year on the farm, i.e. 265 days 8 hours per day, which corresponds to 1 annual work unit (AWU), and in the case of the work of the farm family members (family work unit-FWU). When calculating the effort expressed in AWU (according to Eurostat methodology) it is assumed that a person may not perform work on the farm more than 1 AWU in the course of the year, even in a situation where in fact they are working more.

[31] Chmieliński P., Karwat-Woźniak B., *Zmiany zasobów pracy w rolnictwie indywidualnym w latach 2000-2005*, Zagadnienia Ekonomiki Rolnej, 3/2007, p. 61-80.

agricultural sectors of the labour market, processes of labour migration from rural areas (including foreign), concentration of factors of production (particularly land resources), an increase in the level and complexity of mechanization of farm work, specializing in production and changes in its structure.

While the decline in labour had a universal nature, its intensity was different depending on the size of the farm. In relatively small-scale farms the pace at which the workload became smaller was relatively greater in relation to entities with an average area, especially with relatively large acreage. In the years 2005--2011 in farms of to up 5 ha, the labour effort per 100 ha decreased by more than a quarter, while in farms of more than 50 ha per agricultural land there was virtually no change. However, there is still a huge variation in cost between farms of small and large acreage (tab. 3). This situation bears witness to the sustained and consistently large fragmentation of Polish agriculture.

2.4. The demographic structure of persons managing individual farms

One of the conditions for progress in the agricultural industry are socio--economic characteristics of persons working there, especially managers of farms, because they take the strategic agricultural business decisions. For this reason, it is their attitude, dedication and skill that to a large extent, determine the economic health of managed farms. It is generally considered that their improvement has a positive effect on the effects of economic production obtained[32]. For this reason, the structure of age and education of persons in this group is an important element in the assessment of quality of work in agriculture.

In may works it is underlined that change and development primarily attracts relatively young people. This thesis applies to issues related to the reconstruction of the structures of the agricultural sector, and, in principle, to adaptation strategies implemented by entities operating in the sphere of agricultural production to relatively rapidly changing external conditions.

Analysis of data from field studies showed more and more obvious symptoms of deterioration of the age structure of farm managers. In 2011, the farmers ' share in the mobile working age was 36%, and was about 9 pp. higher than in 2000. At the same time, we saw a systematic expansion of the group of managers in the non-mobile working age and retirement age. In the years 2000-2011, the share of this group in the older working non-mobile age increased from 43 to

[32] *Generational renewal in EU agriculture: statistical background*, Brief no 6, European Commission, 2012.

52%, and for retirement age from 10 to 12[33]. However, the age structure of the Polish farmers could still be considered satisfactory, especially against the background of the situation in this respect in EU agriculture (Figure 2). This situation is favourable notably from the pro-efficiency perspective of preconstruction of agricultural structures.

Figure 2. Managers of individual farms in Poland and EU-27 by age

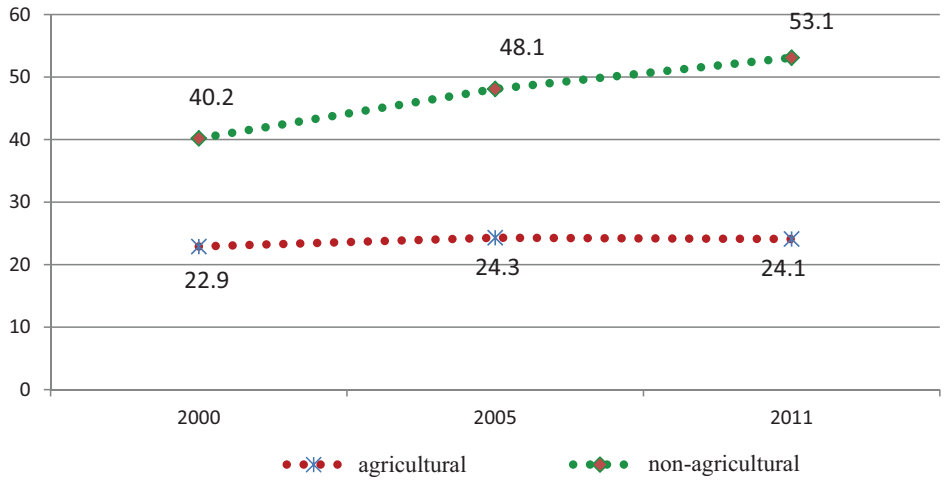
Source: Eurostat 2007, IERiGŻ-PIB 2011.

Modern agriculture requires comprehensive knowledge[34]. For this reason, an important feature of those running the farm, which has a significant impact on production and financial effects achieved from agricultural activities is knowledge and skills of the manager.

[33] More on changes in demographic characteristics and level of education of managers of individual farms: B. Karwat-Woźniak, Przeobrażenia w cechach społeczno-demograficznych kierowników rodzinnych gospodarstw rolnych w Polsce w warunkach nasilającej się konkurencji w świetle badań terenowych [in:] Cechy społeczno-demograficzne i aktywność ekonomiczna kierowników gospodarstw rolnych, praca zbiorowa, Raport PW nr 84, IERiGŻ-PIB, Warsaw, 2013, p. 56-91.

[34] A. Kowalski, *Czynniki produkcji w agrobiznesie*, [in:] *Encyklopedia Agrobiznesu*, ed. A. Woś, Fundacja Innowacja, Warsaw 1998, p. 108-114.

Figure 3. The level of vocational training of farm managers in Poland



Source: IERiGŻ-PIB survey 2011.

Knowledge factor, in the situation of increasing competition, determines more and more the amount of income from business[35]. At the same time, the contemporary prerequisite for development is to raise skills and invest in agricultural education by trainee farmers.

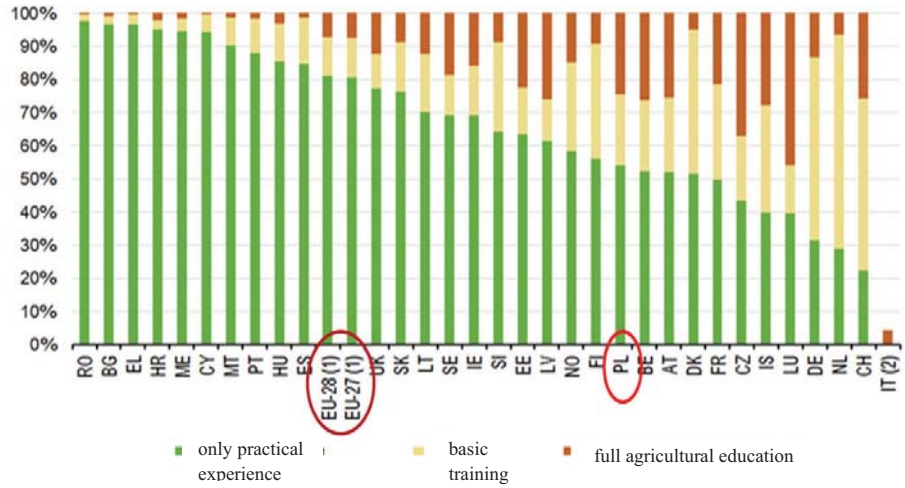
From the analysis of the available empirical data we can see that generational changes among those in charge of the farm went hand in hand with an increasingly higher level of their education. These changes should be considered as very positive, for the level of education has a direct impact on the speed and effects of the implementation of the technical and technological innovations in agriculture and there is a significant correlation between the level of training and equipment in means of production[36].

The data collected from the survey show that in the period 2000-2011 there was progress in disseminating school agricultural qualifications (figure 3). Both farm users, as well as members of individual farms as well as their family members prefer non-agricultural education which makes it possible to be active in the non-agricultural sectors of the labour market.

[35] B. Klepacki, *Znaczenie wiedzy i wykształcenia w rozwoju rolnictwa*, Zagadnienia Ekonomiczne, 2/2005, p. 47-57.

[36] M. Dudek, *Rola czynnika ludzkiego w rolnictwie indywidualnym na przykładzie gospodarstw emerytów i młodych rolników*, PW 2005-2009 raport 91, IERiGŻ-PIB, Warsaw 2008.

Figure 4. Managers of individual farms in Poland and UE-28* according to agricultural qualifications' level



* In view of a different education system for farmers, data for Italy (IT) are incomparable, hence the chart includes them to a limited extent.

Source: Eurostat, 2013.

Throughout the period 2000-2011 the share of managers who completed agricultural schools did not change and remained at 23-24%. At the same time, there was a systematic decrease (from 27 to 17%) of the share of farmers with only course-based preparation for the occupation of a farmer. As a consequence, there was an increase (from 50 to 59%) in the group of managers who virtually have no formal qualifications.

Against the background of the countries of the European Union, Poland has a relatively favourable position when it comes to the level of professional preparation for the profession. The share of farm managers with professional preparation (agricultural school education) for the profession is higher than on average in the EU (figure 4).

Level of education together with the favourable age structure show a relatively high level of quality of human capital in the Polish agriculture compared to other countries. This is a prerequisite for pro-efficiency transformations, occurring in the agricultural sector.

2.5. Conclusions

In spite of symptoms of aging rural community, the age structure is still beneficial when compared to the population of the cities. A positive phenomenon observed over the years is the systematic increase in the educational level of rural residents. The largest increase was noted in respect of people with higher education, whose share more than doubled over 6 years However, the level of education in the rural population is significantly different from that recorded in the cities.

By analyzing changes in the level of economic efficiency indicator for the rural population, it can be seen that it increases systematically, but slightly. Given the inverse processes in the case of city dwellers, we can conclude that the two communities are increasingly similar at this level.

Deruralisation processes in the Polish village are not only changes in relationships of populations that do not have agricultural real estate and population related to a farm, but also changes in this part of the rural population, which is linked to a farm. In recent decades there has been acceleration of the pace at which the participation of the persons working on farms is becoming lower among all persons employed. There are also changes in the extent of their involvement in its activities. In the years 2000-2011 population working on the farm full-time decreased, but there was an increase in the number of those working only on a temporary basis. Hence there is a growing number of those we can classify as agricultural population that is not involved, or involved in agricultural work to a limited extent.

In the years 2005-2011 labour of family members was lower, both in per-farm terms, as well as in relation to 100 ha of agricultural land. However, there is still a huge variation in labour between farms of small and large acreage which shows large fragmentation of Polish farms.

Against the background of the countries of the European Union, Poland sits relatively favourably both in terms of the age structure of managers of individual farms, but also when it comes to their level of education, in particular professional preparation for their occupation of a farmer.

References

1. Becker G. S., (1993), *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, University of Chicago Press, Chicago.
2. Checchi D., Lucifora C., (2004), *Education, Training and Labour Market Outcomes in Europe,* Palgrave Macmillan,.

3. Chmieliński P., Karwat-Woźniak B., (2007), *Zmiany zasobów pracy w rolnictwie indywidualnym w latach 2000-2005,* Zagadnienia ekonomiki rolnej, 3/2007.
4. Dudek M., (2008), *Rola czynnika ludzkiego w rolnictwie indywidualnym na przykładzie gospodarstw emerytów i młodych rolników,* PW 2005--2009 raport 91, IERiGŻ-PIB, Warsaw.
5. *Generational renewal in EU agriculture (2012), statistical background*, Brief no 6, European Commission.
6. *International Encyclopedia of Social Policy,* (eds) T. Fitzpatrick, H. Kwon, N. Manning, J. Midgley, G., Pascall, Routledge, 2006.
7. Karwat-Woźniak B., Sikorska A., (2013), *Migracje ludności wiejskiej w latach 2005-2011,* IERiGŻ-PIB, Warsaw.
8. Karwat-Woźniak B., (2013), *Przeobrażenia w cechach społeczno-demograficznych kierowników rodzinnych gospodarstw rolnych w Polsce w warunkach nasilającej się konkurencji w świetle badań terenowych [in:] Cechy społeczno-demograficzne i aktywność ekonomiczna kierowników gospodarstw rolnych*, praca zbiorowa, Raport PW nr 84, IERiGŻ--PIB, Warsaw.
9. Klepacki B., (2005), *Znaczenie wiedzy i wykształcenia w rozwoju rolnictwa*, Zagadnienia Ekonomiczne, 2/2005.
10. Kowalski A., (1998), *Czynniki produkcji w agrobiznesie*, [in*:] Encyklopedia Agrobiznesu*, ed. A. Woś, Fundacja Innowacja, Warsaw.
11. Sikorska A., (2013), *Procesy przekształceń strukturalnych w wiejskiej społeczności i chłopskim rolnictwie. Synteza*, IERiGŻ-PIB, Warsaw.
12. Sikorska A., (2001), *Zmiany strukturalne na wsi i w rolnictwie w latach 1996-2000 a wielofunkcyjny rozwój obszarów wiejskich. Synteza.* IERiGŻ, Warsaw.
13. Sikorska A., (2001), *Zmiany w wielkości badanych wsi oraz mobilność rodzin* [in:] *Przemiany strukturalne we wsiach objętych badaniem IERiGŻ w latach 1996-2000*, IERiGŻ, Warsaw.

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3. Agriculture and climate change

3.1. Introduction

Climate change is one of the most common environmental problems mentioned. The dynamics of these processes is small, and the effects noticed with a lot of delay, at least a couple of years. Such a situation causes that implementing the strategy for adapting to the challenges of climate change should be done with at least over ten years in advance. In practice, this means that the analysis of the consequences of climate change should concern the period 2030-2050.

In such a distant perspective, it is difficult to provide concrete results, let alone solutions. However, costs to adapt to climate change will require long periods of action, meaning these already need to be included in research.

Climatic problems also apply to agriculture and rural areas functioning. Traditionally, it is believed that this sector is the largest victim of changes. Research on greenhouse gas emissions show that this also has significant responsibility for those processes. As a result, development strategies will require us not only adapt to the new conditions, but also to take initiatives to mitigate the pace of change.

The purpose of this article is to illustrate the likely impact of the effects of climate change on agriculture. It was developed on the basis of an analysis of literature from this field.

3.2. Climate change in the world

Conditions on different areas are subject to constant change, arising from the variability in the factors influencing climate. The most important of these include: Milankovic cycles, the activity of the Sun, clouds and dusting of atmosphere, and variability of greenhouse gas concentrations in the atmosphere. Typically, these processes are very slow, which means that adapting to them does not require extraordinary initiatives [cf. Prandecki & Sadowski 2010]. However, sometimes this is followed by a sudden imbalance, which is most often caused by external factors, for example explosions of supervolcanoes or space objects with a large size hitting our planet.

Today, we have to deal with another sudden climate change process. Its primary source is considered to be civilization transformation taking place on Earth; i.e. increased greenhouse gas emissions, which is the result of the industrial revolution and the growth of population.

According to the Intergovernmental Panel on Climate Change with 95% probability we can consider that the present changes are attributable to man who exploits the environment [IPCC 2013]. In 2012 34.5 billion tonnes of CO_2 were emitted globally, which represented an increase of 1.4% compared with 2011. [Olivier et al. 2013]. The growing trend has been seen for many years. Preliminary calculations suggest that in 2013 this trend also remained the same [Le Quéré et al. 2013]. Forecasts do not predict the occurrence of any relevant factor, which could reverse the situation in the coming years. This is confirmed by the report of UNEP [2013], in which it was found that the gap between the actual greenhouse gas emissions, and political assumptions is growing. Research also shows the existence of correlations between greenhouse gas emissions and GDP growth [Le Quéré et al. 2009] with the result that in the current economic system, it is difficult to expect a decrease in emissions.

As a result, it must be assumed that the objective adopted by the UN for limiting the temperature rise to plus two degrees Celsius by 2050 seems unlikely. This is confirmed by the analysis of carbon budget, that is, the amount of carbon compounds that can be found in the atmosphere, because the majority of emissions have already been used [IEA 2013]. Taking into account that technological change in the energy sector, which is the main issuer of greenhouse gases, has progressed very slowly and are counted in decades [Voser 2009], it is difficult to imagine achieving a significant share of energy coming from low-carbon sources.

The IPCC assumes that by 2050 the world's average temperature will rise by about 2 degrees Celsius [IPCC 2013]. In Europe, these changes will be more severe. In addition, they will be dependent on the time of year (cf. tab. 1.). In addition, with the shift to the East, i.e. into the land, the temperature rise is greater.

From the point of view of economics, the temperature change is not a serious threat. More worrisome are its effects. The estimates in this area are subject to even greater volatility than in the case of temperature forecasts. Among the most important of them we can mention threats caused by flooding of coastal areas, an increase in the intensity and impact of weather anomalies, population migration, loss of biodiversity, the spread of tropical diseases and the deterioration of the conditions of access to water, in particular, drinkable water. In the literature we can find attempts to estimate the scale of such losses and their calculation in cash [cf. Stern, 2006]. However, different methods of measurement

cause that the scale of the phenomenon and projected consequences are different, and the uncertainties are interpreted differently [Enserink et al. 2013]. This causes that they should be more regarded as guidelines for the direction and impact of individual trends rather than precise calculations.

Table 1. Prospects of increased temperature in Europe under a medium scenario (in degrees Celsius)

Period	December-February			June-August		
Area	Western Europe	Poland	Northern Europe	Western Europe	Poland	Northern Europe
Between 2015-2035	up to 1^{o}	up to 1,5^{o}	1,5-2^{o}	up to 1^{o} on the Baltic Sea coast, North Sea and Atlantic; The central part of the continent up to 1,5^{o}	up to 1^{o} Pomerania; the remainder of the country 1-1, 5^{o}	1-1,5^{o}
Between 2035-2065	up to 1,5^{o}	1.5-2^{o} Western Poland 2-3^{o} Eastern Poland	1.5-5 ° increase in easterly direction	2-3^{o} British Isles up to 2^{o}	2-3^{o}	2-3^{o}

Source: Own elaboration on the basis of [IPCC, 2013].

3.3. Climate change and agriculture

Agriculture plays an important role in the process of climate change; i.e. it is responsible for about 13% of global greenhouse gas emissions [IPCC 2007]. It is worth noting that in this sector, CO_2 emissions are often treated as comparable with the ability of crops to absorb this substance [IPCC 2006] and does not constitute a serious threat. What is of concern is the responsibility of the sector for about 60% of the N_2O emissions and for 50% of CH_4. The concentration of these substances in the air is a lot smaller than CO_2, but their individual impact on climate change is much larger.

Elevated CO_2 concentration causes larger plant growth and accelerates the growing process. However, this is not only due to an increase in yields, but mainly the earlier and greater increase in growth of leaves and prolonged period of flowering. Observations show that the increase of temperature by 1 degree causes a 4-5 fold growth of leaves and flowers. The consequence of these processes is the increased demand for water [Wolkovich et al. 2012] and enhanced

activity of insects. The latter process involves both positive phenomena, for example, increased pollination, and negative, for example, faster spread of diseases.

However, the increase in temperature also means other consequences. In the case of crops, it typically involves reduced productivity. Its scale is difficult to calculate because the estimates in this respect vary significantly depending on the species, and the methodology of the study. For example, it is estimated that a single temperature rise causes approx. a 10% decline in rice yields, which is one of the basic, global, nutrients [IPCC 2007]. In total, it is assumed that the combination of the two effects will not affect the efficiency of production or weaken it to a small extent [Randers 2012].

In addition, climate change is usually associated with earlier spring. In the case of the northern hemisphere estimates show that the acceleration is from 2.3 day [Parmesan & Yohe 2003] per decade to 5.5 [Root et al. 2003]. For Poland, it is assumed that for 2030, compared with 2000, the period will be about 16 days, i.e. up to 230 [MS 2013]. The consequence of this phenomenon is a time gap between the activity of predators and their prey. This affects the decline of biodiversity and ecosystems, including the deterioration of conditions for food production [Thackeray et al. 2010].

These developments will have a significant impact on food production, but a significantly higher risk is associated with the problem of access to water. It can be already felt quite strongly on a number of areas of the Earth [Chartres and Varma, 2010]. In 2009, its shortcomings affected approx. 2.8 billion people. In 2030, this may concern even 3.9 billion people [Lean 2009]. The UN Secretary General summed this up very emphatically. At the Global Water Forum in October 2013, he pointed out that the water deficit will affect half of mankind [RT 2013]. The cause is not only a physical lack of resources, but also the economic water poverty, i.e. the situation in which users cannot afford to supply this good [Parliamentary Office of Science and Technology 2002]. Both these issues should be taken into account in the context of climate change.

It is generally considered that the limitations in obtaining water will be the most important consequence of global warming processes [Stern 2006]. However, in most scenarios for the development of agriculture, we examine only the direct consequences, i.e. decline in production capacity, and completely ignore the loss resulting from the social aspects of this phenomenon, i.a. the impact of conflict on the productivity of agriculture.

In the case of agriculture, it is not only the issues of access to water and soil moisture, but also the amount of precipitation that are important. In the first case, in areas which are currently intensively agriculturally used, we may notice a decrease in water availability. In the future, this issue will be strongly felt in

Europe, where the effects of changes will be most noticeable. In addition, problems will affect the southern part of the United States and South America, mainly Brazil. In areas which are already suffering from water deficits water changes will not be as great, but in most cases the situation will also worsen. An exception to this rule may be the African Sahel area. Observations show that, contrary to the typical trends, along with increased temperature, humidity in this dry area is growing, creating a tropical [Tierney i de Menocal 2013] friendly to agriculture.

In the case of rainfall a similar situation is to be expected, i.e. the biggest changes will happen in the southern part of Europe, while in the northern and central parts of the continent, precipitation is expected to increase. This phenomenon will intensify in the East, which means that the greatest changes will be observed in Siberia. A significant increase in precipitation is also expected in Canada [IPCC 2013].

Factors associated with climate change and access to water resources are soil erosion and its salinity. In the event of an increase in temperature and decrease in soil moisture both of these processes have progressed much faster. Moreover, there is an increase threat of fires, which can cause losses in agriculture.

Climate issues also affect the availability of land area for use by agriculture. On the one hand, there will be the dryness and erosion in areas traditionally considered as farmland, and, on the other hand, new sites will be available, where climatic conditions have so far prevented such activities. In addition, along with a warming climate, there will be increased pressure on combating deforestation in other areas. As a result, it is estimated that globally, the area of agricultural land will not change substantially.

3.4. Agriculture in Poland and climate change

Even if we limit the temperature rise to the level of plus two degrees Celsius by 2050, there will be significant consequences for agriculture. This causes the first this sector should take action to adjust to change and possibly at the same time prevent further changes [Serrao-Neumann et al. 2013]. In practice, in spite of the prevailing opinion of the scientists about the need to take account of climate change in farming [Górski i Kuś 2003] this is treated as a secondary issue. This applies not only to national policies, but also to the activities of international organizations, including the FAO [Cowie 2009].

The problem of climate change also applies to Poland. As shown in table 1, the expected rise in temperature in the country will be higher than the European average. This causes the problem that climate change should be treated as seriously as in the case of the Mediterranean countries, and Scandinavia. In

particular, this applies to the north-eastern part of the territory of Poland, which will be exposed to much more extreme conditions than is the case at present.

The national effects of climate change will be only slightly different from Western European ones. This applies both to the direct factors; i.e. changes in terms of management conditions and indirect ones. The latter include changes in international and domestic environment, non-farm conditions.

Certainly, Poland is less vulnerable to flooding of low-lying coastal areas. Even in the case of Żuławy, the cost of protection against increased sea water levels should be much lower than in European countries located over the ocean or the North Sea, and Mediterranean Sea. Extreme weather, especially hurricanes and flooding, should also have a smaller scale. However, this does not mean that they should be ignored. With increasing temperature, we can expect to see a growing number of them. Data from the 1998-2010 show an increasing trend, resulting in an approximately four-fold rise in their incidence [Klimanda 2013].

Major threats include an increased risk of tropical diseases. Already now we notice the activity of immigrant species of insects spreading this kind of disease. However, the most dangerous phenomenon should be considered the risk of water deficits. Poland is now considered a country with limited water resources [Kaczmarek 2003]. A rise in temperature can cause the occurrence of its persistent shortfall in agriculture [OECD 2013]. In particular in the Western and central part of the country (mainly Greater Poland and Kuyavia).

Therefore, the consequence will be increased demand for irrigation systems. It is estimated that in Poland it will be at a similar level as is currently the case in Western Europe. In addition, it is worth noting the variation in precipitation, resulting in periods of drought alongside prolonged downpours, with floods and flooding. In total, it is expected that the annual volume of rainfall in Poland will increase [IPCC 2013].

In addition, changes in global agriculture, i.e. decline in the importance of the existing powers and the expected increase in the position of Russia and Canada will give rise to new conditions of competition for Polish farmers. Analysts predict that an increase in the importance of Northern countries in agricultural production would be so large that, in the case of Canada, this can lead to achieving the status of a superpower [Smith 2010]. Poland could still play an important role in food production. Forecasts indicate that the country will have relatively better conditions for agriculture than in the countries of Northern and Western Europe, which will cause a local competitive advantage. A skilful use of the knowledge and organisational capabilities gives us hope that Poland might be able to compete even with a much cheaper Eastern European products.

However, this requires changes in infrastructure, in particular to provide systems for water retention and field irrigation.

In conclusion, in view of climate change, we may distinguish the following opportunities for Polish agriculture:

- improved competitive situation, by the deterioration of conditions in many areas, including those that are significant for agriculture: USA, Brazil;
- extension of the growing period;
- accelerated plant growth as a result of a higher concentration of CO_2;
- the possibility of the introduction of new crops, typical for warmer areas.

Climate warming also includes such threats as:

- deterioration of the competitive position of Poland due to the possibility of the development of agriculture in Russia, Canada and other countries of Northern Europe;
- growing number and scale of sudden adverse weather conditions (torrential downpours, hurricanes, storms);
- water deficits and the need to enhance the management of water resources;
- an increase in the risk of soil erosion;
- costs of adaptation infrastructure to the new conditions;
- lack of financial resources.

The balance of these phenomena is difficult to quantify. A very general literature analysis leads to the conclusion that Poland will still have considerable opportunities to play a significant role in agriculture, provided that adaptation activities are taken. They include a wide range of initiatives. The first and primary one is education to increase awareness of the likely risks and long-term trends in agriculture. The research to date [cf. Gwiazda and Kolbowska 2009] shows that the level of awareness is low, and Poles mainly expect institutional solutions, rather than think about the action taken at micro level, for example at the level of farms. In practice it is these units that will incur the cost of changes introduced. Often they will be associated with minor changes; i.e. the necessity of changing the crops into those more suited to the conditions (including the greater resistance to high temperatures and reduced need for water). It is important, however, to note that fine-tuning practices can be much more expensive. One of the key aspects should be to adapt infrastructure to new challenges. In particular, we must take into account the possibility of the occurrence of heavy rainfall and resulting flooding and the occurrence of hurricane winds. Building new structures, especially of permanent nature, should take into account not only the modern standards of construction, but also requirements that may arise in connection with the spread of extreme phenomena. We should also assume that

the cost of insurance against weather will grow gradually. This is due to the growing amount of damage and the resulting payment of compensation. This should also be taken into account.

Apart from farms, a considerable responsibility falls on State institutions. We may note that long-term development strategies in most cases do not include agriculture. The issue of the effects of climate change, is also being marginalised. The only exception is the Ministry of Environment "Strategic plan of adaptation for the sectors and areas susceptible to climate change until 2020 with a perspective until 2030", prepared in October 2013, [MS 2013], in which a few pages are dedicated to agricultural issues. Other activities, for example, agri-environmental and climatic programmes have a completely different action horizon, with the result that they serve more the implementation of current than long-term climate policy.

This issue described should be the subject of strategic research, but it is also hard to find positive examples in this area. One of the exceptions in the area of agricultural and climatic domain is the Monitoring System for Agricultural Drought in Poland run by IUNG, but this tool is not intended to create long-term predictions.

It is worth noting that Poland as a member of the European Union may be forced to take account of climatic conditions in agriculture. The above Ministry of the Environment strategy referred is the result of fulfilling EU commitments. Furthermore, new proposals on energy and climate policy for 2020/2030 years, assume including the agricultural sector in the system for reducing greenhouse gas emissions, which will entail increased costs of food production. The European system assumes the need for emissions trading, i.e. their purchase by emitters (farmers). Research shows, however, that in this sector the opposite approach would be more effective. The introduction of additional payments to farmers contributes to the increase of CO_2 [De Pinto, Ringler, & Magalhaes 2012].

One of the first actions should therefore be to draw up an analysis for the long-term effects of climate change in the Polish agriculture and possibilities to adapt to the new situation. Such an analysis and a strategy based on it should take into account not only the issues pertaining to agriculture, but also a broader approach to climate change, for example, water management. This would make it possible not only to secure production capacities in agriculture, but also to reduce the risk of flooding and flood. It is worth noting that in Germany, a country much better equipped with water, a broad plan to build water retention reservoirs was undertaken under the influence of the analysis for future water management. Only on the basis of such documents we can expect that farmers take adaptation activities.

3.5. Conclusions

Taking into account the progress of the international arrangements on climate change, the temperature rise should be considered inevitable. The effects of this phenomena are difficult to identify, but the basic trends are foreseeable. Changes will also apply to Poland. The strength of the impact of certain factors, for example changes in the period of vegetation, erosion processes and the availability of water resources, will most likely have a significant impact on the shape of agriculture. The effects of climate change in the Polish agriculture will be visible in the 2020-2030 decade, resulting in the need to take account of these phenomena in the country's development strategies and, in particular, the Polish agriculture.

A thorough analysis of the economic aspects of climate change is not possible. This applies to both the costs of adjusting to the new requirements and the assessment of the potential benefits that may result from the transformations in the world market. Many areas that provide food for the world can find themselves in a situation that will be more difficult than that of Polish agriculture. In parallel, we will be able to observe the development of new agricultural powers, i.e. mainly Canada and Russia. This means different conditions of competition and the need to seek new markets. The transformation will not occur abruptly, but we should be aware of the existence of such trends.

Long-term nature of climate change does not mean that adjustment processes should be deferred over time. Their complexity and capital intensiveness may require substantial and long-term planning. In addition, it is worth noting that the effects of climate change will not only affect agriculture. Effective adaptation activities must therefore be comprehensive in nature, i.e. in addition to agriculture, they should take into account initiatives for infrastructure, water management, spatial policy, education and finance.

In the sector of agriculture and food economy the first stage should be information activity concerning the most likely effects of the predicted changes. In this way, the person related to agriculture will be able to realize the risk of further activities and take the most appropriate steps.

References

1. Chartres C. J., Varma S., (2010), *Out of water: from abundance to scarcity and how to solve the world's water problems*, Pearson Education, Upper Saddle River.
2. Cowie J., (2009), *Zmiany klimatyczne. Przyczyny, przebieg i skutki dla człowieka*, Wydawnictwa Uniwersytetu Warszawskiego, Warsaw.

3. De Pinto A., Ringler C., Magalhaes M., (2012), Economic Challenges Facing *Agricultural Access to Carbon Markets* [in:] *Climate Change Mitigation and Agriculture*, cf. collection edited by E. Wollenberg, A. Nihart, M.-L. Tapio-Bistrom, M. Grieg-Gran, Earthscan, London, New York, p. 61-68.
4. Enserink B., Kwakkel J. H., Veenman S., (2013), Coping with uncertainty in climate policy making: (Mis)understanding scenario studies. *Futures*, (53), 1-12.
5. Górski T., Kuś J., (2003), *Wpływ zmian klimatu na rolnictwo*, [in:] *Czy Polsce grożą katastrofy klimatyczne?*, Polska Akademia Nauk Komitet Prognoz "Polska 2000 Plus", Warsaw, p. 66-81.
6. Gwiazda M., Kolbowska A., (2009), *Polacy o zmianach klimatu,* Centrum Badania Opinii Społecznej, Warsaw.
7. IEA, *World Energy Outlook 2013*, International Energy Agency, Paris 2013.
8. IPCC, *2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4: Agriculture, Forestry and Other Land Use,* National Greenhouse Gas Inventories Programme, Kanagawa 2006.
9. IPCC, *Climate Change 2007: Impacts, Adaptation and Vulnerability*, Intergovernmental Panel on Climate Change, Cambridge 2007.
10. IPCC, *Climate Change 2013 The Physical Science Basis. Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, New York 2013.
11. Kaczmarek Z., *Wpływ zmian klimatu na gospodarkę wodną*, [in:] *Czy Polsce grożą katastrofy klimatyczne?*, Polska Akademia Nauk Komitet Prognoz "Polska 2000 Plus", Warsaw 2003, p. 32–52.
12. KLIMADA, *Tendencje zmian klimatu*, 2013, Pozyskane z: http://klimada. mos. gov.pl.zmiany-klimatu-w-polsce/tendencje-zmian-klimatu/[Data: 12.02.2014].
13. Le Quéré C., Peters G. P., Andres R. J., Andrew R. M., Boden T., Ciais P., Yue C., *Global carbon budget 2013*, *Earth System Science Data Discussions*, *6*(2)/2013, s. 689–760, doi:10.5194/essdd-6-689-2013.
14. Le Quéré C., Raupach M. R., Canadell J. G., Raupach M., Marland G., Woodward, F. I., *Trends in the sources and sinks of carbon dioxide*, *Nature Geoscience*, *2*(12)/2009, s. 831–836, doi:10.1038/ngeo689.
15. Lean G., *Water scarcity now bigger threat than financial crisis*, *The Independent*, 15.03.2009.
16. MS, *Strategiczny plan adaptacji dla sektorów i obszarów wrażliwych na zmiany klimatu do roku 2020 z perspektywą do roku 2030*, Ministerstwo Środowiska, Warsaw 2013.
17. OECD, *Water and Climate Change Adaptation. Policies to Navigate Uncharted Waters*, OECD Publishing, Paris 2013.

18. Olivier J.G., Janssens-Maenhout G., Muntean M., Peters J.A., *Trends in Global CO_2 Emissions. 2013 Report*, PBL Netherlands Environmental Assessment Agency; Joint Research Centre, The Hague; Ispra, 2013.
19. Parliamentary Office of Science and Technology, *Access to Water in Developing Countries,* Postnote No 178, London 2002.
20. Parmesan C., Yohe G., (2003), *A globally coherent fingerprint of climate change impacts across natural systems*, *Nature*, (421), p. 37–42.
21. Prandecki K., Sadowski M., (2010) *Międzynarodowa ewolucja ochrony środowiska*, LAM - Wydawnictwo Akademii Finansów, Warsaw.
22. Randers J., *2052 A Global Forecast for the Next Forty Years*, Chelsa Green Publishing, White River Junction 2012.
23. Root T.L., Price J.T., Hall K.R., Schneider S.H., Rosenzweig C., Pounds J.A., *Fingerprints of global warming on wild animals and plants*, *Nature*, (421)/2003, p. 57–60.
24. RT, *Water scarcity by 2030: True for every second person on earth, UN says*, *RT News* 8.10.2013, Accessed: http://rt.com/news/water-shortage-un-population-901/ [Date: 16.10.2013].
25. Serrao-Neumann S., Di Giulio G. M., Ferreira L. C., Low Choy D., *Climate change adaptation: Is there a role for intervention research?*, *Futures*, (53)/2013, p. 86–97.
26. Smith L. C., (2010), *The world in 2050: four forces shaping civilization's northern future*, Dutton, New York.
27. Stern N., (2006), *The Economics of Climate Change (The Stern Review)*, Cambridge University Press, Cambridge.
28. Thackeray S.J., Sparks T.H., Burthe S., Bacon P.J., Bell J.R., Botham M.S., Wanless S., *Trophic level asynchrony in rates of phenological change for marine, freshwater and terrestrial environments*, *Global Change Biology*, *16*(12)/ 2010, s. 3304–3313, doi:10.1111/j.1365-2486.2010.02165.x.
29. Tierney J.E., de Menocal, P.B., *Abrupt Shifts in Horn of Africa Hydroclimate Since the Last Glacial Maximum*, *Science*, *342*(6160)/2013, p. 843–846.
30. UNEP, *The Emissions Gap Report 2013*, United Nations Environment Programme, Nairobi 2013.
31. Voser P., *Energy transition: not for the faint-hearted*, *The Globe and Mail*, 17.09.2009, Accessed: http://www.shell.com/global/aboutshell/media/speeches-and-webcasts/2009/voser-globe-and-mail-17092009.html
32. Wolkovich E.M., Cook B.I., Allen J.M., Crimmins T.M., Betancourt J.L., Travers S.E., Cleland E.E., *Warming experiments underpredict plant phenological responses to climate change*, *Nature*, 485/2012, p. 494–497, doi:doi:10.1038/nature11014.

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4. Political rent and agricultural producers' investments

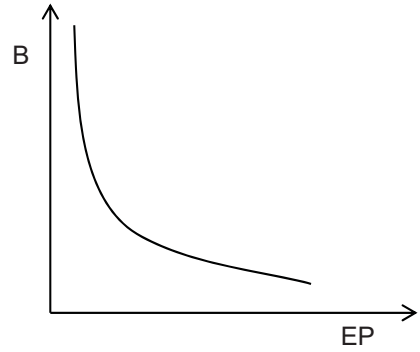
The aim of the work is to investigate the relationship between political rent and political investments of agricultural producers. This is a follow-up on the research, the results of which are presented in [Bezat-Jarzębowska et al. 2013a][37]. We use the analytical approach supported by empirical evidence drawn up on the basis of FADN data. First, we state a problem, then we frame it analytically and verify empirically.

4.1. Outline of the problem

Assuming rationality of the agricultural producer's action, their effort to maximize income and assuming the existence of two sources of income, namely political rent (*B*) of the exogenous nature associated with the occurrence of agricultural policy[38] and economic rent as well as of the endogenous nature, resulting from the characteristics of the production processes[39], the topic of the existing research was the nature of the relationship between the two rents [Bezat-Jarzębowska et al. 2012, Bezat-Jarzębowska et al. 2013a, 2013b]. According to the results obtained, the relationship between these rents can be considered as a substitute relationship. Schematically this is illustrated by Figure 1.

[37] In this cited publication, the reader finds a direct reference and development of the presentation "*Political rent and investment of agricultural producers*" presented at the Conference PW IERiGŻ-PIB in Jachranka on 09.12.2013.
[38] Cf.[Wilkin 2005]. Jak wskazuje Kosior [2011] zjawisko „pogoni za rentą" (*rent-seeking*) jest również często przywoływane w pracach dotyczących trudności w reformowaniu WPR (patrz także [Furtan et al. 2009, Schmitz et al. 2010]).
[39] As economic rent we defined production efficiency (PE) in value terms as the difference between the revenue and the cost of involving manufacturing factors.

Figure 1. Substitutability of political and economic rent



Source: Own work.

In analytical terms, the results obtained indicate that, in accordance with the manufacturer's goal function described by formula (1), the manufacturer makes a choice on the basis of a substitution rate defined by formula (2), deciding to get more benefit from that source of income, whose use is relatively cheaper and more efficient. Since improving the efficiency of using manufacturing factors when with given pricing relationships[40] is a harder task, we used the effects of agricultural policy.

$$\boldsymbol{m_t = f(EP_t, B_t) \rightarrow max} \tag{1}$$

where:

t – time index,

m – income.

$$\boldsymbol{S_{EP/B} = \frac{\Delta EP}{\Delta B} = -\frac{\partial U_R^{EP} / \partial EP}{\partial U_R^{B} / \partial B}} \tag{2}$$

Where:

U_R^{EP} – utility of improving the efficiency of agricultural producer incomes,

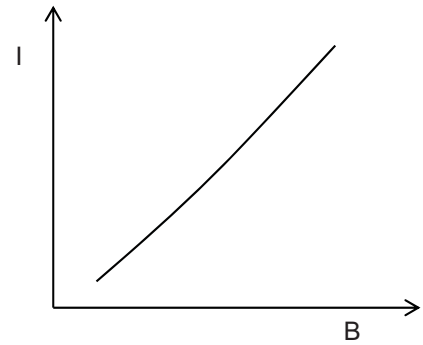
U_R^{B} – usefulness of political rent for incomes of agricultural producer .

[40] The relationship of prices obtained for products to prices paid for inputs of manufacturing factors.

This choice is optimal in the short term. In the long term where it is possible to change the technical relationship, this issue takes on a different character. Beneficial modifications of the technical relationships can lead to improved efficiency of production, including - what is particularly important - increased efficiency of work [Bezat-Jarzębowska et al. 2013a, Rembisz et al. 2013]. What becomes important in this perspective is the investment in durable manufacturing factors, owing to which these technical changes (which could also be called changes in manufacturing techniques) can take place. In the case of the agricultural producer, this concerns in particular the ratio of physical capital factor, i.e. machinery and equipment and land factor to labour factor.

For this reason, the subject and the purpose of the comments in this paper is the role of a political rent in shaping the investments in fixed assets, or more generally, in the physical capital of agricultural producers. We put a hypothesis according to which political rent acts as a catalyst for investment in fixed assets for agricultural producers. This means that the relationship that occurs between the investments and income obtained from the political rent is complementary, as shown schematically in Figure 2.

Figure 2. Complementarity of the political rent and investment



Source: Own work.

Due to the complexity of the issue addressed in this paper, we focus only on the analysis of the dynamics of these two phenomena.

Relationship of savings, investment and income

In the analysis, we make the following assumptions:

1. Decisions on the farm are taken by the owner.
2. Decisions on the farm are taken in a rational way.

3. Agricultural producer's household (farm owner) spends its income on consumption, savings and taxes.
4. An increase in income is effected by payment received in the framework of the CAP.
5. The basis for investment are the savings [41] of the decision maker (farm owner).

According to the final objective, we can write the investment function as:

$$\boldsymbol{I_t = f(S_t)} \tag{3}$$

where:

I – investment.
S_t – savings,

Basic relations testifying to the role of investment for productivity as a source of revenue can be written as follows:

$$\boldsymbol{S_t \Rightarrow I_t \Rightarrow K_t \Rightarrow \frac{K_t}{L_t} \Rightarrow \frac{Y_t}{L_t}} \tag{4}$$

where:

I – investment,
K – capital,
L – labour,
Y – production.

Savings (both *ex-post* and *ex-ante*) are the source of investment financing, which in turn improves the relationship of capital factor (including land) to labour and eventually leads to a higher efficiency of labour factor and thus ultimately increases revenue.

In considering the further distribution of income in accordance with the third assumption, it can be seen that:

[41] It does not matter whether they are ex-post or ex-ante savings (credits), it is essential that the level of these savings is increased thanks to CAP payments (e.g. creditworthiness increases).

$$\boldsymbol{m_t = C_t + S_t + T_t} \tag{5}$$

where:

C – consumption,

T – taxes.

Political rent is the source of additional income, savings and investments.

Taking into account the income from political rent (assumption 4) we get:

$$\boldsymbol{B_t + m_t = C_t + S_t + T_t} \tag{6}$$

Using additional income from political rent depends on the preferences of the decision maker. The additional revenue can be used for consumption, but may also become the basis for future investment. In accordance with the relationship (6), the effects of political rent can, in fact, influence the evolution of consumption and savings when they are part of revenue of the manufacturer:

$$\boldsymbol{m_t = C_t + (S_t + B_t) + T_t} \tag{7}$$

$$\boldsymbol{m_t = \left(C_t + \frac{c_B}{C_t} B_t\right) + \left(S_t + \frac{s_B}{S_t} B_t\right) + T_t} \tag{8}$$

where:

c_B – propensity to consume out of income from political rent,

s_B – propensity to make savings out of income from political rent.

In this context, taking into account the relationship (4), the existence of the impact of political rent on investment policy seems obvious. At the assumed investment function (3) the role of savings in respect of the effects of political rent and its relationship with income increase in future periods can be shown as follows:

$$\boldsymbol{B_t \frac{s_B}{S_t} \uparrow \Rightarrow I_t \uparrow \Rightarrow \frac{K_t}{L_t} \uparrow \Rightarrow \frac{Y_t}{L_t} \uparrow \Rightarrow w_L \uparrow \Rightarrow c_L^{t+1} \uparrow} \tag{9}$$

where:

w_L – labour factor productivity,

c_L – compensation of labour factor.

As we can see there is a beneficial catalysing effect of political rent on the level of investment, which could lead to an increase in the efficiency of work and increased income in subsequent periods. This defines the concept of "catalization" used in this work.

Model of the dependence of political rent savings and income

When taking into account the inter-period relations, the above relations of savings (current and future) and the payment out of political rent (current and future) and investment can be written as the following model:

$$\boldsymbol{S_{t-1} + S_{t+1} \Rightarrow I_t} \tag{10}$$

$$\boldsymbol{(S_{t-1} + S_{t+1}) + (B_t + B_{t+1}) \Rightarrow S_t \Rightarrow I_t} \tag{11}$$

$$\boldsymbol{S_t < I_t} \tag{12}$$

$$\boldsymbol{\Delta B_t \Rightarrow \Delta I_t} \tag{13}$$

$$\boldsymbol{\Delta I_t > \Delta S_t \Leftarrow \Delta B_t} \tag{14}$$

$$\boldsymbol{\Delta m_t \Rightarrow \Delta I_t} \tag{15}$$

$$\boldsymbol{\Delta(m_t + B_t) \Rightarrow \Delta I_t} \tag{16}$$

$$\boldsymbol{\Delta m_t < \Delta I_t} \tag{17}$$

$$\boldsymbol{\Delta m_t > \Delta I_t} \tag{18}$$

The relations between these values have a kind of recursive and dynamic character. We may have noticed that in a situation where there is inequality (12), a too low level of savings can be a problem in the long run, hindering the ability to make appropriate investments, which could contribute to an increase in the performance of labour factor on which income is based. If we assume that political rent income has an impact on the political development of savings ($s_B \neq 0$), they may be a factor that leads to the reduction of this limit (14). This is an important dimension of the concept of catalizing impact of political rent on investments of agricultural producers.

Through the propensity for consumption and savings (also for income derived in respect of political rent), the investments are dependent on the amount of income gained (15 and 16). So it seems that it can be concluded that the relationship between income and investments has a two-fold nature, related to the fact that agricultural producers can be treated as entities that are described in sufficiently good way by the macroeconomic producer theory, i.e. by focusing on the aspect of their production activities as well as households whose goals are met thanks to the functioning of the farm. In the first perspective, we can bring up the relationship with the level of investment (desired by the decision maker) of resource of capital factor[42] or profit level[43] [Weersink, Tauer 1989].

In the latter perspective, the relationship of investment and income is associated with variation, seen in the amount of income obtained in farm life [Burfisher, Hopkins 2003]. It can also be influenced by the changing objectives of farms as pointed out by Wallace and Moss [2002].

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[42] We present the conditions for the savings and payments out of rent for achieving target with an index of proportionality of production to the capital in [Bezat-Jarzębowska et al. 2013a]. At this point, we will only cite the condition of profitability of investments (marginal income from investments):

$$\frac{\Delta Y_{t+1}}{\Delta K_t} - \delta = r \tag{19}$$

$$K^* = \nu Y \tag{20}$$

where:

δ – capital factor depreciation,
r – real interest rate,
K^* – target capital factor resource,
ν – proportion between increase in production and increase in capital factor.

There are two aspects in dynamic relations to this, describing the growth rate for investment necessary to maintain K^*:

$$\frac{\Delta I}{I} = \frac{\Delta K}{K} = \nu \frac{\Delta Y}{Y} \tag{21}$$

$$\left(\frac{\Delta S}{S} + \frac{\Delta B}{B}\right) \Rightarrow \frac{\Delta I}{I} = \frac{\Delta K}{K} = \nu \frac{\Delta Y}{Y} \tag{22}$$

[43] In the case of farms we indicate the income as the right category.

Statistical perspective of the relationship of income and investment

To investigate whether political rent income can have catalytic effects on investment it therefore becomes essential to examine the relationship of investment growth and income growth (including the income derived by the producers from political rent). The source of funding for investment is also important, given the dynamics of obligations. On this basis, we defined three indicators.

The first of the proposed indicators is defined by formula (23) and it is directly related to the fundamental problem addressed in the work, i.e. the issue of the possible induction of investments undertaken by agricultural producers in relation to political rent. In order to be able to talk about positive (development) effects of political rent, investment growth must exceed the rate of growth of income in respect of political rent. Hence the indicator is defined in such a way as to take the value of 1 for farms where:

$\Delta I > \Delta B$:

$$\boldsymbol{m_{IB}} = \begin{cases} \mathbf{1} & ; \quad \dfrac{\Delta \boldsymbol{I}}{\Delta \boldsymbol{B}} > 1 \\ \mathbf{0} & ; \quad \boldsymbol{wpp.} \end{cases} \tag{23}$$

The second indicator reflects the relationship of investment and income. It is defined by formula (24).

$$\boldsymbol{m_{Im}} = \begin{cases} \mathbf{1} & ; \quad \dfrac{\Delta \boldsymbol{I}}{\Delta \boldsymbol{m}} > 1 \\ \mathbf{0} & ; \quad \boldsymbol{wpp.} \end{cases} \tag{24}$$

m_{Im}takes a value of 1 for farms in which investment growth exceeds the rate of growth of income and 0 otherwise.

The last of defined indicators (26) refers to the relationship between investments undertaken by the agricultural producer and obligations[44]. This indicator takes the value of 1 for the farms in which investment growth exceeds the rate of increase and 0 otherwise, in accordance with the formula:

[44] Obligations can be recognised as the relationship between the savings that need to be made in future periods and political rent:

$$\boldsymbol{Z_t} = (\boldsymbol{S_{t+1}} + \boldsymbol{B_{t+1}}) \tag{25}$$

$$m_{IZ} = \begin{cases} \mathbf{1} & ; \quad \dfrac{\Delta \boldsymbol{I}}{\Delta \boldsymbol{Z}} > 1 \\ \mathbf{0} & ; \quad \boldsymbol{wpp}. \end{cases} \tag{26}$$

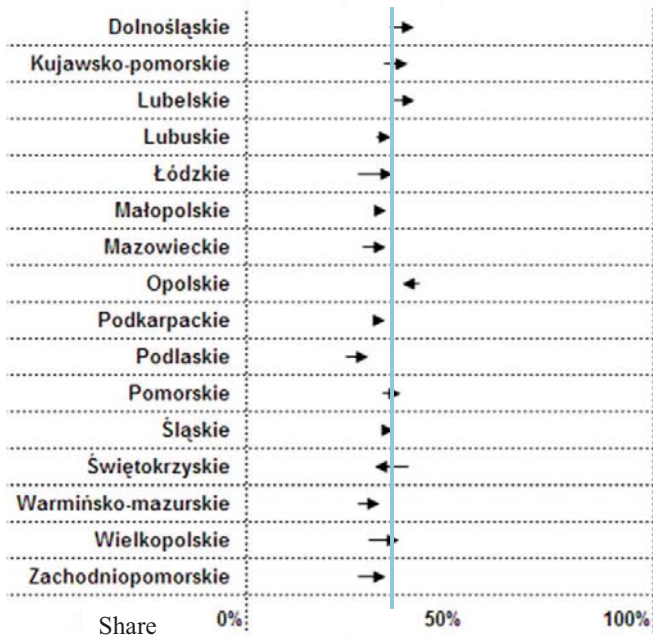
The value of indicators referenced here which are equal to 1 may be indicative of the impact of political rent on investments by agricultural producers. The basis for inference are relative values.

4.2. Empirical analysis of the relationship between political rent and investments

The data used in the work of comes from the database of the Polish FADN. Observations from 2004-2011 were used, showing changes in the value of indices (24-26) for this period at regional level. For indicator m_{IB} observed changes are small. The difference in share of agricultural income changed little for which investment growth rate exceeded the rate of growth of income from political rent was not greater than 0.10. In the trend analysis of the indicator m_{IB} in 2011 compared to 2004, at regional level, it can be seen that in all provinces the shares of farms for which investment growth rate is higher than the growth rate of income from political pensions were similar. This indicates that the share of agricultural producers using income effects of agricultural policy primarily for investment has probably stabilized. The share is close to a half. We can see a marked increase in these shares in Łódzkie, Wielkopolskie and Zachodniopomorskie, and declines in Świętokrzyskie and Opolskie. Although the changes were minor, except for those two exceptions, we saw an increase in the shares of farms for which the investment growth rate was higher than the growth rate of political rent income. It is a kind of confirmation of the hypothesis about the impact of political rent on investment of agricultural producers. Change in shares is shown in Figure 3.

Farms, for which it can be considered that political rent has a catalizing effect on investments represent, as mentioned, and as can be seen from the above figure, a little less than half of the sample analyzed. However, during the analyzed period their share increased, which appears to be a positive phenomenon. This may implicitly indicate, that, in accordance with the formula (6) these producers allocate, to a lesser extent, the additional income from agricultural policy on increase in consumption.

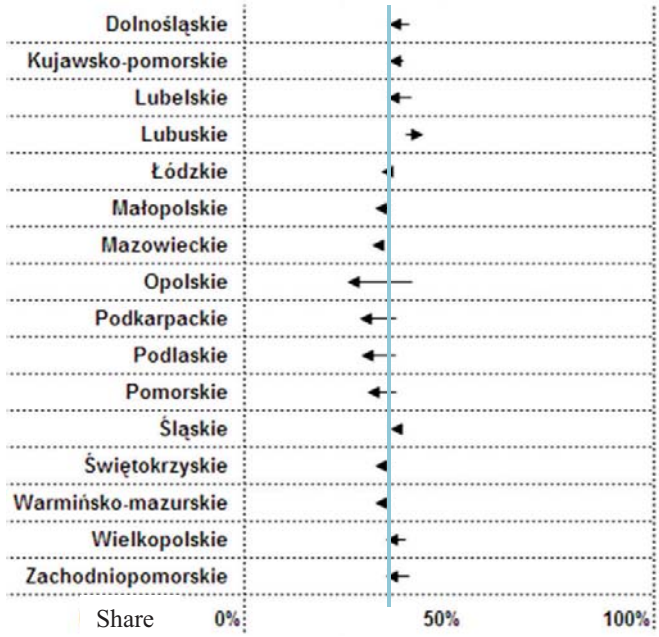
Figure 3. Share of farms for which the investment growth rate is higher than the growth rate of political rent income and changes in this share between 2010/2011 to 05/2004 by provinces (voivodeships)



Source: Own compilation based on FADN data.

For m_{Im}, describing the dynamics of investment in relation to the growth of income, increasing the share of farms for which the value of that indicator exceeds unity has been reported only in Lubuskie Voivodeship (see fig. 4), which is not a positive phenomenon in the sense of our hypothesis. On the other hand, what is positive for this hypothesis, it is worth noting that in most provinces (voivodeships), the share of farms for which investment growth exceeds the rate of growth of income are on the same, almost fifty per cent level.

Figure 4. Share of farms for which the investment growth rate is higher than the growth rate of income and its changes in the time period from 2001/2011 to 2004/2005, by provinces (voivodeships)

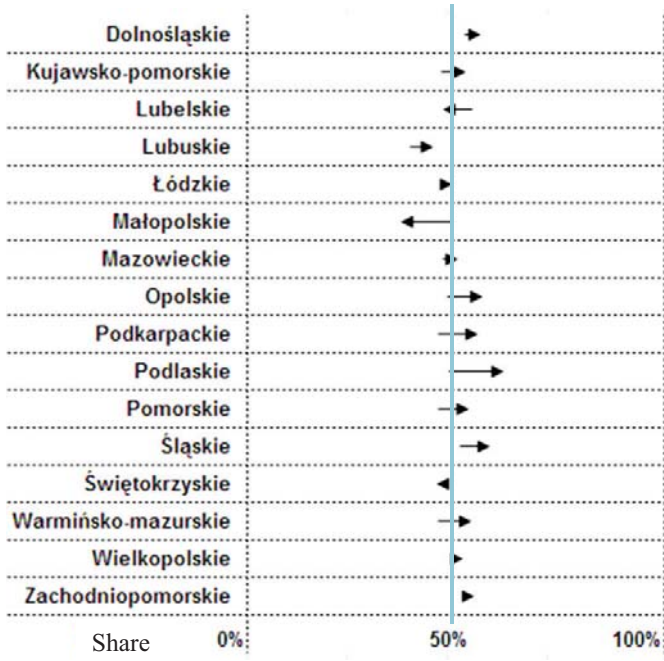


Source: Own compilation based on FADN data.

When analysing the shares of farms for which m_{IZ} takes a value of 1 (i.e., for which investment growth exceeds the growth rate of obligations), we will notice that they, too, are close to 0.5, but remain higher than the analogous values for previously discussed indicators. This of course is another argument in favour of the confirmation of the hypothesis about the catalyzing impact of rent on agricultural producers' investment. Also their changes are marginally higher than in previous cases. At regional level, we can highlight one region characterised by clear (compared to others), growth of this indicator (Podlaskie). An equally distinct change (decline in the share of farms for which investment growth exceeds the growth rate of obligations) has been reported in the case of Małopolskie Voivodeship. In most other provinces, the share of farms in which investment growth exceeds the growth rate of obligations or increased slightly over the period, or remained at the same level (e.g. in Łódzkie). Despite the fact that, on the basis of the research conducted, there is no conclusive reason to conclude that the existence of political rent can reduce the role of obligations, as a source of financing investment, it seems that it can be considered that the fact of an increase in the share of farms, in which investment grew faster than obli-

gations is a manifestation of a (positive) political rent income effect on agricultural producers' investment.

Figure 5. The shares of farms, for which investment growth exceeds the growth rate of obligations and changes in this regard between 2010/2011 in relation to 2004/2005, by provinces



Source: Own compilation based on FADN data.

A summary is shown in Table 1. Its includes average rates of change in shares of farms for which the analyzed indicators take a value of 1, i.e. for which the investment growth rate is higher than the growth rate of payments, income and obligations. It is worth noting that none of the indicators presented are characterized by a high rate of change. This means that, although the share of farms in groups listed by us evolved from 2004 to 2011, average changes were not significant.

Table 1. Average rate of change in m_{IB}, m_{Im} and m_{IZ} by voivodeships

Index / Voivodeship	m_{IB}	m_{Im}	m_{IZ}
Dolnośląskie	0.0188	-0.0160	0.0096
Kujawsko-pomorskie	0.0193	-0.0116	0.0162
Lubelskie	0.0166	-0.0186	-0.0188
Lubuskie	0.0127	0.0129	0.0179
Łódzkie	0.0318	-0.0090	0.0074
Małopolskie	0.0087	-0.0126	-0.0375
Mazowieckie	0.0215	-0.0089	0.0101
Opolskie	-0.0128	-0.0553	0.0221
Podkarpackie	0.0038	-0.0319	0.0258
Podlaskie	0.0231	-0.0299	0.0329
Pomorskie	0.0152	-0.0246	0.0204
Śląskie	0.0082	-0.0013	0.0179
Świętokrzyskie	-0.0273	-0.0049	-0.0056
Warmińsko-Mazurskie	0.0204	-0.0051	0.0219
Wielkopolskie	0.0265	-0.0158	0.0059
Zachodniopomorskie	0.0258	-0.0185	0.0039

Source: Own compilation based on FADN data.

4.3. Conclusions

The subject of the work is the role of political rent in shaping farm investment. The hypothesis set says about the catalyzing impact of political rent on investment or, to put it differently, about complementary relationship occurring between the income obtained from political rent and investments. Based on the results obtained thanks to the FADN data analysis from the period 2004--2011, this hypothesis can be verified positively, albeit ambiguously. Despite the fact that the share of farms, in which investment growth exceeds the rate of growth of income including from political rent, is not prevalent, it concerns almost half of the tested population and increased in the period analyzed. It should be added that for the vast majority of provinces there was an increased share of farms where investments were faster than obligations. This conclusion may also indicate a positive catalytic effect of income from political rent on investment of agricultural producers. Deepening the analysis of the impact of political rent on the choices of agricultural producers is planned as a matter of further research.

References

1. Bezat-Jarzębowska A., Rembisz W., Sielska A., (2012), *Wybór polityki i jej wpływ na decyzje producentów rolnych w ujęciu analitycznym z elementami weryfikacji empirycznej*, Raport PW issue 49, IERiGŻ-PIB, Warsaw.
2. Bezat-Jarzębowska A., Rembisz W., Sielska A., (2013), *Wpływ polityki rolnej na decyzje producentów rolnych odnośnie dochodów i inwestycji*, Raport PW nr 97, IERiGŻ-PIB, Warsaw.
3. Bezat-Jarzębowska A., Rembisz W., Sielska A., (2013), *Substytucyjność źródeł dochodu producenta rolnego*, Wieś i rolnictwo, 3 (160), p. 28-52.
4. Burfisher M.E., Hopkins J. (ed.), *Decoupled Payments: Household Income Transfers in Contemporary U.S. Agriculture*, Market and Trade Economics Division, Economic Research Service, U.S. Department of Agriculture, Agricultural Economic Report No. 822, 2003.
5. Furtan H., Sauer J., Jense M.S., (2009), *Free-riding on rent seeking—an empirical analysis*, Public Choice, 140: 479–500.
6. Kosior K., (2011), *Koncepcje reform Wspólnej Polityki Rolnej*. *Unii Europejskiej* po 2013 roku, Gospodarka Narodowa 5-6, p. 85-104.
7. Rembisz W., Bezat-Jarzębowska A., (2013), *Ekonomiczny mechanizm kształtowania dochodów producentów rolnych,* , IERiGŻ-PIB, Warsaw.
8. Schmitz A., Moss C. B., Schmitz T. G., Furtan H. W. Schmitz H. C., (2010), *Agricultural Policy, Agribusiness, and Rent-seeking Behavior*, Toronto.
9. Wallace M. T., Moss J. E., (2002), *Farmer Decision-Making with Conflicting Goals: A Recursive Strategic Programming Analysis*, Journal of Agricultural Economics, Vol. 53, No. 1, pp. 82-100.
10. Weersink A. J, Tauer L. W., (1989), *Comparative Analysis of Investment Models for New York Dairy Farms*, American Journal of Agricultural Economics, Vol. 71, No. 1, pp. 136-146,.
11. Wilkin J., (2005), *Pogoń za rentą przy pomocy mechanizmów politycznych*, [in:] tenże (ed.), *Teoria wyboru publicznego: Wstęp do ekonomicznej analizy polityki i funkcjonowania sfery publicznej*, Wyd. Naukowe Scholar, Warszawa, p. 204-219.

III. The new Common Agricultural Policy from the perspective of third countries

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1. The role of government in building the competitiveness of rural areas in Serbia[45]

The authors, based paper work on secondary research, reflect and assessment of current competitiveness and development rural areas of the Republic of Serbia. Considering the numerous advantages of the factor that rural areas have, proposed measures and activities for the greater prosperity of these areas, which are the responsibilities of the governmental, regional and local authorities. The main objective of the paper work is to show ways of the economic empowerment of the region through increased employment and higher living standards, as well as their social progress and sustainable development.

1.1. Introduction

In great part of its rural areas, Serbia has all prerequisites for promotion and successful implementation of the concept of multifunctional agriculture and integrated rural development: richness of diversity in rural areas, significant natural resources, preserved natural environment of rural areas, great potential for development of wide range of non-agricultural activities in the countryside.

On the other hand, there are many limitations and weaknesses in the field of rural development: unfavourable production and ownership structure in agriculture, unfavourable business environment for SMEs and entrepreneurs, little support for farmers from agricultural budget, underdeveloped physical and market infrastructure, lack of entrepreneurial spirit, lack of linkage between farmers, high government centralization and limitations of local self-government in implementation of rural development projects.

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Given the poor rural poverty of numerous constraints for the development of rural regions, the authors propose measures and actions required to improve the competitiveness of rural regions in Serbia. The implementation of the proposed measures will have a direct impact on the reduction of expressed socio-economic differences between the regions in Serbia, especially between rural-urban areas. Besides, balanced regional development and revival of rural areas in Serbia indirectly lead to the achievement priorities defined in the document Europe 2020: A strategy for smart, sustainable and inclusive growth [EU, 2010]: (1) Smart growth: developing an economy based on knowledge and innovation; (2) Sustainable growth: promoting a more resource efficient, greener and more competitive economy; (3) Inclusive growth: fostering a high--employment economy delivering social and territorial cohesion. The Law on Regional Development (Official Gazette of RS No. 51/2009 and Official Gazette 30/10), for the purpose of encouraging regional development determined by the following regions in Serbia, in accordance with the Nomenclature of Territorial Units for Statistics (1) Region of Vojvodina, (2) Belgrade region, (3) Region Šumadije and Western Serbia, (4) Southern and Eastern Serbia, (5) Region of Kosovo and Metohija. These regions used in Table 1 and in the analysis of indicators of Gross Domestic Product by Regions.

Regarding the rural regions, it is important to emphasize that the Serbia there is no official definition of rural areas. The criteria applied by the Statistical Office do not include the standard rural indicators, which can be found in international practice (population density, population, the share of agricultural population, etc.) and division between urban and other settlements is based on municipal decisions, by which the city status is granted to a settlement that has made the Master Plan. Therefore, urban settlements are those that are proclaimed as urban by the decision of the local self-government, and the rest of settlements is classified as „others", that is rural settlements.

Such an approach to the definition of rural areas makes difficult to statistical analysis and interpretation of indicators of rural areas. Thus National Rural Development Programme 2011 (abbreviated NRDP), provided an amended / modified strategical categorization, until the NUTS regionalisation is fully implemented (Official Gazette No. 15/2011, page 6). According to NRDP, 2011 rural areas are all inhabited territories except cities, which granted that status according to the Law on territorial organization of the Republic of Serbiaand have more than 100.000 inhabitants.

Also, within the EU project *„Support toRural Development Programming and Payment System for the Republic of Serbia and Montenegro"*, by cluster

analysis of more than forty indicators, defined next homogeneous rural regions of Serbia (Official Gazette No. 15/2011, page 22-24);

1. Region of highly productive agriculture and integrated economy:
2. Region of small urban economies with labour intensive agriculture;
3. Mountain region with economy based on natural resources;
4. Region of high tourism capacities with poor agricultural structure.

It is important to emphasize that this division of rural areas is not officially recognized, nor is it present in the statistical reports of the National Bureau of Statistics, Serbia.

1.2. Regional inequalities and urban rural inequalities in Serbia

According to NRDP data (Official Gazette No. 15/2011, page 11), size of the rural areas in Serbia (without the Kosovo and Metohija) is 65.952 km², which makes 85% of total territory of the country. About 83% of the total number of settlements is located in rural areas, and the average population density in the Republic of Serbia is 97 inhabitants/km^2 and is much lower in rural (63 inhabitants/km^2) compared to urban areas (289 inhabitants/km^2).

Characteristics of rural areas of Rep. of Serbia are given in NRDP, 2011 (Official Gazette No. 15/2011, page 16-18) and indicating the following: rural areas are characterized by high level of differentiation in terms of demographic trends, natural, economic and market conditions (availability of the market and conditions for marketing), then the conditions for agricultural production, rural and social development.

Economic structure of rural areas in the Republic of Serbia is highly dependent from the primary sector (agriculture, mining industry, power supply). According to data of the National Program for Rural Development 2011-2013 (Official Gazette No. 15/2011, page 9), a share of the sector Agriculture, Forestry and Water Management in domestic product of rural areas (data for 2004) amounts around 30%, which is considerably higher than in the other countries in transition. This role in the economic structure of the country agriculture has, primarily due to favorable factor for the development of a variety of conditions and intensive agriculture: a favorable geographical location of the country, the availability and quality of agricultural land, water resources, raspoloživost and low labor costs, low land prices [Paraušić, Potrebić, Simonović 2013].

However, despite of all factors and trade advantages (signed free trade agreements with the EU and a numerous of important countries), the competitiveness of the agricultural and food sector of the Republic of Serbia and rural areas in the domestic and international markets is extremely low. In the

opinion of the European Economic and Social Committee (Stantič, 2011, page 2), the only competitive advantages of rural areas in the Western Balkans are: (a) low labor costs and (b) high-quality natural resources. On the absence of the competitiveness of agro-food sector and rural areas of the Republic of Serbia point out the following indicators: [Paraušić, Potrebić, Simonović 2013]

- Although in the GDP of rural areas a dominant share has agriculture activity, the realized BDP per capita in rural areas (data for 2004) is lower for one fourth than the national average of the Republic of Serbia (Official Gazette No. 15/2011);
- Low productivity of agricultural production, first of all, due to its extensive character, leads to low salaries and low life standard of agricultural producers. Statistical data show that poverty in rural areas is more than double in regard to urban areas. That is to say, the statistical data for 2010 point out to a fact that 5.7% of poor people is in urban areas and 13.6% in rural areas (Poverty in the Republic of Serbia, 2008-2010).
- According to the WTO data, export of agricultural-food products per a hectare of agricultural area for the Republic of Serbia is significantly less in comparison to the EU-15 countries, but also in regard to the surrounding countries Bulgaria, Hungary, Croatia, Slovenia;
- Small number of products in which exchange the Republic of Serbia realizes a high surplus. Those are, primarily, cereals (especially maize), soft fruits (dominantly frozen raspberry and sour cherry), refined sugar and beverages.

The group of authors [Živkov, et al. 2012] point out that Serbia belong the group of countries among most rural countries in Europe (based on demographic trends and their projections), regardless of the methodology of defining rurality, space in Serbia emphasized rural, with unfavorable parameters for development. According to these authors, a village in Serbia is characterized by difficult access to the infrastructure, the more expensive and less quality education of population, less likely to come to work and earn. These authors [Živkov, et al. 2012] indicate that rurality of Serbia is not only a consequence, but also is a cause of the economic situation in the country and it could be improved in the future through overall economic developement, which administration want to see, but also where industry and business are ready and want to invest.

In the document, UNDP from 2010. gave a strong warning about the unfavorable situation in the rural areas in different aspects, and the necessity that in Serbia develop and implement effective policies which can be relevant for

inclusion rural population and for sustainable rural development. The main findings related to rural areas in this study are as follows [UNDP, 2010]:

1. Poverty and material deprivation are highly represented;
2. The financial market is not structured according to the needs of farms and the specifics of Agriculture;
3. The differences in the standard of family farms stems from the possibility of achieving earnings in other sectors outside of agriculture and of social benefits, and the diversification of income;
4. Poverty is significantly associated with the characteristics of the employment of the rural population;
5. Educational characteristics of the rural population are favorable, and chance to improve human resources in this aspect of the limited number of obstacles.
6. Coverage of the rural population by social security is not satisfactory.
7. Access of rural population to social services is extremely weak.
8. Socijalni kapital seoske populacije je nizak, a kulturna participacija pasivna i slabo diversifi kovana.

Regional inequalities

In addition to the adverse performance of rural areas, Serbia is characterized by pronouncedly regional differences. Authors [Mijačić, Paunović 2011] present a legislative and institutional framework of regional development in Serbia, as well as the analysis of regional disparities across different geography, elaborated through six selected indicators: Population and population density (analyzed as a single indicator), Regional GDP, Employment, Unemployment, Business Demography and Budgetary Revenues per capita. Results of these authors [Mijačić, Paunović 2011] shows that regional disparities in Serbia are among the largest inEurope, reflected in the high ratio between developed Serbia-North and lagging behind Serbia-South. Inter and intra-regional disparities are also high, especially at the local level, as well as along the urban-rural division. In historical terms, out of 45 undeveloped municipalities of Serbia, 30 of them have not changed their development status for about four decades. Even more, regional disparities have been drastically accelerated in the transitional period 2001-2010, when peripheral regions were not able to address their developmental needs in asufficient way. This further caused extreme imbalancesin demography, income, unemployment, social welfare and living standards in general.

Table 1. Gross Domestic Product by Regions, 2011

	GDP - total		GDP – per capita	
	Mil. RSD	Share, %	Thous. RSD	Level index, RS=100
Republic of Serbia	3,208,620.2	100.0	442	100.0
Belgrade region	1,271,690.6	39.6	772	174.6
Region of Vojvodina	859,808.1	26.8	442	100.0
Region of Šumadije and Western Serbia	610,143.0	19.0	301	68.2
Region of South and East Serbia	466,978.5	14.6	285	64.4
Region of Kosovo and Metohija	-	-	-	-

Source: Statistical Office of the Republic of Serbia, p.131.

Data of the National Bureau of Statistics (Table 1) on the amount of GDP per capita by regions, indicating that the regions Šumadije and Western Serbia, as well as Southern and Eastern Serbia are significantly behind the Belgrade region, according to the purchasing power of the population, and the amount of living standards.

1.3. Measures and actions to improve rural development and reducing regional disparities in the Republic of Serbia

In the forthcoming period, it is indisputable that the great need for adequate support for rural development which must be provided. Crucial will be state support towards the elimination of restrictions on the development of SMEs sector, which is primarily found in the microeconomic business environment. In order to promote rural development, the state needs to create a favorable and stimulating environment for:

(a) the business sector and SMEs family agricultural holdings,
(b) law enforcement and sanctioning of illegal business,
(c) investitions and create new jobs.

In the segment of creating a stimulating business environment, the crucial will be the role of the state as follows:

- Providing stimulating and predictable agricultural policy, with increased support for rural development from the agricultural budget (it is necessary to allow budget allocation to increase the investment in agricultural or non-agricultural activities, rural infrastructure, etc.).
- The development of an institutional framework for the business sector SMEs (effective legal and judicial framework, effective law enforcement, protection of property rights and intelectual ownership);

- Develop incentive investment, innovation, and tax policy for companies operating in the field of agribusiness, artisan food production according to traditional recipes, organic farming etc.;
- Development of financial markets, with favorable sources of financing and provision of loans for investment in innovation technology, primary production, in export business, etc.;
- An effective competition policy in the market (regulation of monopolies, companies with a dominant market position, punishing the informal economy, etc.)
- The development of all elements of business infrastructure (business incubators, science and technology parks, etc..).In paper work the business infrastructure includes [Mijačić 2011] the networking institutions and organizations that provide services to potential entrepreneurs, entrepreneurs and SMEs to develop their business capacity and provide physical space for commercial activities. Research of authors [Vojnovic, Cvijanović, Lazić 2011] indicates the needs of potential entrepreneurs for the existence of business incubators to facilitate the first steps in the business;
- Improving coordination and cooperation between the various partners in the government, as well as between different levels of authorities in implementing economic and social reforms (in the area of poverty reduction, social inclusion, etc.).

The previous assumptions based on the publication [Union of Employers of Serbia 2013], and based on extensive experiences that authors have in the preparation of regional and rural development of numerous municipalities and cities in the Republic of Serbia. In the context of the foregoing, it can be pointed out and research about rural development assumptions which were made by numerous authors [Živkov, et al. 2012]. These authors suggest that the signals sent by the agrarian, and/or overall economic policy in Serbia so changeable, unstable and erroneous, that even if their changes in the near future, this policy will crucially influence the direction of the activities of rural areas.

Group of authors argues that the village and the villagers in Serbia have a chance, and that this chance will be taken as advantage, they suggest following proposed strategic actions, which is in the context of creating a stimulating business environment for rural development [Živkov et al., 2012];

1. Change the mentality and the rules of the game. It is necessary to leave the the misconception that the village is the same as agriculture, that agriculture can take development of the country and that rural development can be implementing without an overall, including an

urban development. Changes rules of the game involves law enforcement, budget allocations, building the necessary institutions and everything that involves a change in the environment;

2. Diversify the rural economy, which requires that farmers and villagers to become entrepreneurs or entrepreneurial least (work in industry or the service industry, tourism and related service industries);
3. Develop institutions and procedures;
4. The future integration of Serbia into the EU can take beneficial to the development of the village. One of the important policies and values of the EU is the rural development policy, which, although is not perfect, takes care of the countryside, more than any other model in the world;
5. Make good use of EU pre-accession funds, which directly depends on: (a) the willingness of the administration to adapt to the EU system of planning and implementation of measures for the development of rural areas and (b) training of the rural population to the extent and capabilities use it. The question of whether the administration in Serbia is ready and qualified citizens to take advantage of EU funds for rural development (EU funds), the authors do not give a positive response;
6. Strengthening the socio-economic cohesion in rural areas and the preservation of social capital;
7. Ensure equitable and fair social policy.

1.4. Conclusion

Rural areas in Serbia (without the Kosovo and Metohija) makes 85% of total territory of the country and rural areas are characterized by high level of differentiation in terms of demographic trends, natural, economic and market conditions (availability of the market and conditions for marketing), then the conditions for agricultural production, rural and social development.

A numerous of authors and institutions stand out as a major problem expressed in rural poverty and regional inequality in Serbia. In this paper authors point out the need to solve this issue by creating **a stimulating and supportive business environment for business enterprises, associations, family farms.** The crucial role of the state will be as follows:

- Providing stimulating and predictable agricultural policy, with increased support for rural development from the agricultural budget (divide assets from budget is necessary to increase the investment in agricultural or non-agricultural activities, rural infrastructure, etc.).

- The development of an institutional framework for the business sector SMEs (effective legal and judicial framework, effective law enforcement, protection of property rights and intelectual ownership);
- Development incentive investment, innovation, and tax policy for businesses and family farms operating in area of agrobusiness and / or the craft of food production;
- Development of financial markets, providing favorable sources of financing and provision of loans for investment in innovation of technology, primary production, in export business and so on;
- An effective competition policy in the market (regulation of companies with a dominant market position, punishing the informal economy, etc.)
- The development of all elements of business infrastructure (business incubators, science and technology parks, etc.).
- Improve coordination and cooperation between the various partners in the government, as well as between different levels of government in implementing economic and social reforms (in the area of poverty reduction, social inclusion, etc.).

References

1. European Commission (2010), Europe 2020: *A strategy for smart, sustainable and inclusive growth.* Communication from the Commission, COM(2010) 2020 final, Brussels, 3.3.2010.
2. Mijačić D., (2011), *Analysis of Business Support Infrastructure in the Republic of Serbia*. National Agency for Regional Development.
3. Mijačić D., Paunović B., (2011), Regionalne razlike u Srbiji, Ekonomika preduzeća, vol. 59, br. 7-8, 2011, strane 379-389.
4. Official Gazette of the Republic of Serbia No. 51/2009 and No. 30/10. *Zakon o regionalnom razvoju.*
5. Official Gazette of the Republic of Serbia No. 15/2011. *National Rural Development Programme 2011-2013.*
6. Parausic Vesna, Velibor Potrebic, Zoran Simonovic (2013), *„Factor Advantages of the Republic of Serbia in Agricultural Production and a Need for Accomplishment of Sustainable Competitive Advantage in the Market"*, page 63-80, u monografiji: „Sustainable Technologies, Policies, and Constraints in the Green Economy", editors: Andrei Jean-Vasile, Adrian Turek, Jonel Subic, Dorel Dusmanescu. Izdavač: Information Science Reference (IGI Global), USA.

7. Statistical Office of the Republic of Serbia (2011), Anketa o potrošnji domaćinstava, Siromaštvo u R. Srbiji 2008-2010, Saopštenje broj 117, 29.04.2011.
8. Stantič C.(2011), *Opinion of the European Economic and Social Committee on Rural development and employment in the Western Balkans.* Brussels, 21.09.2011, REX/322.
9. Živkov G., Marković, D., I., Tar, D., Božić, M., Milić, B., Paunović, M., Bernardoni, P., Marković, A., Teoflović, N., (2012), *Budućnost sela u Srbiji*, Tim za socijalno uključivanje i smanjenje siromaštva, Kabinet potpredsednice Vlade za evropske integracije, Beograd,Srbija.
10. Vojnović B., Cvijanović, M. J., Lazić, J. (2011), *Preduzetnici u poslovnim inkubatorima*. Industrija Vol. 39, No. 2/2011, Economics Institute, Belgrade.
11. Union of Employers of Serbia (2013), *The views of employers on the business environment*, Belgrade, May 2013.
12. UNDP (2010), Social Exclusionn in Rural Areas in Serbia.

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2. Some issues of resource management in terms of food shortage and energy gap

Problem of efficiency in resource management are not new for agriculture. Land, labor and capital – classical postulates, well known and well researched. For nowadays World (where population increasing extremely fast), the problem of food security is one of the main issues. Along with land (growing population use more land to provide infrastructure for life) and labor (depends on the country – growing population will ensures such number as may be required) now we also faced the problem of water and energy resources. Both of them now play the marin role for economic not only in agriculture, but also in other part of society life. And this problem is also important for Ukraine, which is eight of biggest arable land keeping countries, and potentially one of the biggest agrifood suppliers.

The main hypothesis of our research is to find the optimal combination of agricultural production for both food and energy security for big producing countries (such as Ukraine) as well as for World.

Problem of renewable energy development now together with natural resources is also means various crops. And here we do propose to evaluate the reasons and effects of agricultural crops using as the resource for renewable energy industry. By the FAO statistics during last few years the four main crops (soybean, rapeseeds, sunflower and corn) cover more than 20 per cent of World arable lands. Also we still remember that any alternative energy sources program influents to market demand and supply. On the other hand every country has to provide the energy security as well. Here the most important point is to use the all available resources (water, sun, wind, land, etc.) with the maximum effect.

We consider three levels of food security – national, regional and global. In our paper we will concentrate on first two of it, because the global level depends on national food security of producing and consuming countries, as well as consist on regional food securities of different parts of the World. The problem of food security is actual for the World economy since early ‘90s, when the food supply were faced on society together with huge increasing of population in some parts of the world. There are a lot of different approaches and definitions we can found in literature. Here is the most frequently used of them:

- the capacity at all times to provide the world with staple products to support increased food consumption, while controlling price fluctuations;
- the capacity to reach the desired levels of consumption on an annual basis;
- a given capacity to finance import requirements to meet the desired consumption levels;
- assuring every individual at all times of physical and economic access to the food they need;
- access at all times by all people to the food they need for an active and healthy life (World Bank, 1994);
- a country and a people have food security when the food system works in such a way that no-one is afraid of not having sufficient food;
- when every person has, at all times, physical and economic access to meet their basic food needs. A national food security strategy cannot be contemplated without guaranteeing food security at the level of the home;
- the capacity to ensure that the food system provides the whole population with nutritionally adequate food supplies over the long term (Staatz D'Agostino & Sundberg 1990);
- food security exists when the viability of the household, defined as both a production and a reproduction unit, are not threatened by a food deficit.

Two commonly used definitions of food security come from the UN's Food and Agriculture Organization (FAO) and the United States Department of Agriculture (USDA):

- Food security exists when all people, at all times, have physical, social [1] and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life [2];
- Food security for a household means access by all members at all times to enough food for an active, healthy life.

Food security includes at a minimum (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability of acceptable foods in socially acceptable ways (with the exception of resorting to emergency food supplies, scavenging, stealing, or other coping strategies – USDA) [3].

All the definitions emphasize four types of development:

- from macro-level to the micro-level concern; from the notion of evaluating national food stocks, the concept has developed to the household level based on the perception of means of access (Sen 1981) to the food resources created by the population;
- from concern to ensure an adequate level of supply, towards concern to meet the demand. Are the physical and economic conditions of access adequate? In this stage, there is a shift away from a perception of food as such, towards a consideration of household living standards;
- the breakdown of household consumption reveals the vulnerability of certain sections of the population (women, children, the old) and have driven the search for household level security through the individual's food security;
- from a concern for short-term food security (one year) towards long-term food security (permanent). This development is the consequence of the emergence of the concept of sustainability linked to respect for the environment. [4]

Over these years, most of the definitions have converged towards a number of key words: satisfaction, access, risk, sustainability.

Food requirements must be met in both quantitative and qualitative terms. The concept of sufficient food can be defined in terms of a given number of calories, the quantity needed the quantity needed for survival and leading an active and healthy life, by measuring the consequences of undernourishment (genetic, physiological or behavioural changes), or in terms of an estimated need by household or by individual. The quality of nutrition has to be measured not only by the balanced diet (proteins, fats and carbohydrates) but also through the sufficient intake of micronutrients. Furthermore, food must meet to the certain health and hygiene standards. There is therefore some ambiguity about what constitutes the optimum level of satisfaction.

The level of risk for a household or a community depends on the modalities of access to food and on available capital. To minimize risks, the people use adaptation or reaction mechanisms at three levels:

- production (diversification, staggering, storage) for the rural population, changing the structure of the diet in case of urban dwellers (buying cheap food items);
- economic activities: increasing revenues by working in the formal, but above all the informal sector, or investing in non-productive assets (jewellery, clothing, livestock, liquid cash), exchanging humanitarian aid products for liquid cash or other assets;

- social relations: borrowing in cash or kind, mutual aid and support, multiple registration of the family with humanitarian aid agencies.

When these adaptation mechanisms are inadequate and threaten the household's food security, various things are done to deal with this unfavourable situation, in three stages:

- minimized risk strategy: informal activities by children, changing feeding patterns (urban gardening, reducing food rations, reducing the number of people that eating at home, consumption of cheap food away from home (Akindès, 1995), seeking support (from the family, relations, the community), selling unproductive assets;
- selling productive capital assets: tools, livestock or land in case of the rural population, and selling reserves, renting or selling house relating to urban dwellers;
- temporary migration of certain family members, followed by the permanent migration of the whole household.

The vulnerability of a population in a region suffering from crises depend both on the measures that can be implemented in a given context and on the households capacity to be able to respond to these events. The vulnerability of a population may be estimated by analysing the adaptation and reaction mechanisms and the way of they responding to a difficult situation. When the mechanisms are not effective the household becomes chronically vulnerable.

Sustainability: insecurity is temporary when the household is temporarily incapable of meeting the food requirements of the members of the family. It may be due to unexpected events occurring (insecurity for political reasons) or be seasonal because of logistical difficulties or high prices.

RESEARCH. We do propose to measure the natioanl and regional food security level proceeding from two main conditions, mentioned above. For first condition – ready availability – we propose to evaluate the quantity of produced and imported products (market capacity) at the national and regional level. Differenciation for national and regional level gives us an opportynity to estimate the level of diversity and colmplementary for single product market.

Definitely, it is impossible to evaluate the full list of products, FAO make it accordingly to the quantity of grain storage. In our opinion in this research it would be useful to enlarge the number of products due to nutrition preferences for analysed region or country. The list of items is: cereal, potatoes, sunflower seeds, rice, sugar beet, vegitables, meat, cow milk.

It is also important to answer the question about the country-exporter's social responsibility for forming a stable proposition on the national, regional and world industrial markets. There exists a priority to supply the domestic mar-

kets with available and quality food products. Balance of interests of different countries-suppliers of resources and benefits is rather important. It is necessary to develop energy renewable resources. It could influence on the industry proposition formation.

We need to estimate the market situation, poverty and habits of consumers to define the ability on acquire foods in socially acceptable ways.

Here we also have to distinguish the availability, accessibility (wich depends on supply) and necessity (wich affects on demand).

The problem of self-reliant food security strategy was a key for many countries, especially in the last decade. Food strategy was perceived as an ideal way of attaining a high degree of self-sufficiency by adopting an approach guaranteeing consistency, integration and synergy between actions that had hitherto been piecemeal (Bencharif 1990).

Food self-sufficiency can be achieved in two ways: through self-reliant development, or development with an opening-up to the international market. The former is a protectionist approach, because it aims at meeting national needs through selective imports and a policy to set prices independently of world markets. The latter is based more on the theory of comparative advantages, and has given rise to the concept of food security. It is founded on three principles:

- each country must seek to establish an agrifood trade balance by encouraging international specialization;
- each country must encourage national food production under sound economic conditions;
- each country must ensure that the disadvantaged sections of the population retain adequate access to food.

The gained results will be of great importance from the side of social value (considering the food security problem that is becoming more crucial for the world community); political importance (considering the existing tendency for transformation of the world political view for joint responsibility in making important decisions and selection of direction for the further development of economical and social relations and meeting the social demand); and economical grounding (solving an important problem of counting the interests of consumers, producers, state, and in our situation also separate regions, and the respective influence on the world stability).

Here is one of examples of social-oriented activity of main food producing countries. Developed by regional economic integration organizations in response to the World Food Summit, with support from FAO, Regional Programs for Food Security promote integration and agricultural development among neighboring countries. Regional programs seek to:

- support food security activities in participating countries;
- promote investment to improve rural infrastructure; and
- harmonize food quality standards and trade regulations to enable local producers and traders to gain access to cross-border and global markets [8].

The shifting of self-reliant self-sufficiency strategies towards free market strategies can be put down to three causes (Padilla 1995):

- loss of financial independence by governments, which was an essential condition for implementing a self-sufficiency policy. Export revenues have fallen back while the prices of foodstuffs and goods and services bought on the international market have soared. This upheaval in the terms of trade has had serious repercussions on governments' financial equilibrium;
- subsidies and demographic growth led to an increase in demand, but the inelasticity in the supply of agricultural products and the failure to control technology have pushed up food and technology imports. This has entrenched another kind of dependency, with repercussions on the national debt;
- the difficulty of managing a self-sufficiency policy, which requires a consensus between the conflicting interests of different social groups. "Nothing could be further from the truth than the idyllic image of African societies based on community and mutual support and aid. These are certainly societies based on redistribution and on relationships, but they are run through with a number of oblique strategies, family, ethnic or personal rivalries and clan in-fighting, as well as unspoken opposition between the young and the old" [Engelhard 1996].

As of now food production is one of the most essential global problems requiring solution not only on the level of a separate country or region, but also on the global level. Combination of such factors as increase of population in some countries or some regions, increase of purchasing power, decrease of land usage for agricultural purposes, decrease of water resources tend to make production of the necessary amount of food products problematic. At the same time number of countries, net-exporters ("large" countries) are rather limited. Therefore value for each of these countries is gradually growing on the world food production market.

At the same time the issues of food security production, provision of enough amount of food products, of the relevant quality and for relevant price are becoming more and more important for every country in the world. Very often, during the period of rapid increase of the world prices, some countries in-

troduce export reduction instruments, namely quotas or export taxes (mainly for grain) with the aim to stabilize the domestic prices.

The primary stage is generalization of the existing data base and selection of the research instruments. The next stage is a consequent analysis of the proposition formation in Ukraine, in Central and Eastern Europe and in the world containing the influence on consumption indexes, prices and availability of Ukrainian food industry. Furthermore, it is necessary to calculate the potential amount of industry production, coordinate the amount with the world demand production prognosis and calculate the amount of the resources necessary for the food industry production. Comparing the potential amount with the existing and potentially available in Ukraine it is possible to analyze the necessity and practicality of selecting the diversification and specialization of Ukraine's agri-industrial production and estimate the relevant economic effects for both producers and consumers.

Table 1. The main exporting countries (by 6 main crops), 1999-2008

Countries	(US$ '000)				
	1999-2001	2003-2005	2006	2007	2008
United States of America	10.039.729	11.798.336	13.575.475	21.255.229	29.096.897
France	4.151.339	4.980.965	5.015.145	6.686.403	10.025.642
Canada	2.971.431	2.924.720	3.982.985	5.602.992	8.577.653
Argentina	2.375.862	2.608.085	2.993.295	4.914.761	7.216.026
Thailand	1.758.139	2.365.300	2.659.948	3.597.938	6.350.902
Australia	2.886.061	3.085.593	3.522.895	4.560.333	4.571.315
Germany	1.514.356	1.585.853	1.893.585	2.483.345	3.870.204
Ukraine	472.084	878.392	1.356.697	1.066.807	3.828.273
India	863.587	1.744.283	1.706.547	3.588.086	3.493.220
Russian Federation	169.336	1.078.979	1.595.427	4.178.160	3.455.644
Viet Nam	774.468	1.033.454	1.276.265	1.490.208	2.900.400
Kazakhstan	421.032	513.394	741.313	1.635.086	2.483.075
Brazil	183.527	481.042	608.775	2.044.428	1.933.427
Hungary	291.783	476.049	756.906	1.636.071	1.855.557
Pakistan	579.872	817.279	1.247.384	1.331.729	1.738.998
Belgium	406.758	590.414	627.938	955.970	1.418.398
Italy	516.872	576.990	640.850	783.732	1.235.182
United Kingdom	549.288	649.637	554.552	746.580	1.117.467
World	**36.009.771**	**44.585.839**	**51.913.148**	**79.283.905**	**108.542.060**

Source: www.fao.org, FAO Statistical Yearbook 2010.

The following research will need applying different instruments depending on the stage and achievement of a separate task. Modeling is used to determine Ukraine's influence on the regional and world agri-industrial markets. The

modeling stipulates analysis of separate countries' markets and specifically the world market; a set of products (both complementary and substitute goods); trade terms or conditions, presence and amount of tax, quotas, export subsidies, application of interventions and either existing or planned level of state support.

As the research is based on the necessity of influence on the proposal formation, the results of this research will be applied for the following stage: determining the level of effective resources usage, the main criterion of which will be non-economic efficiency.

Determination of the advantages of either specialization or diversification of the country's agri-industrial production exclusively relates to considering producers and consumers' interests. The following aspect of the research should use economic estimate of each of the directions of strategy formation and their influence on the social well-being.

Agriculture is an important economic sector for most East-European countries. Such countries as Romania, Hungary, Poland, Slovakia, Moldova, Belarus and Ukraine heavily depend on the level of agricultural production and rural development in the structure of the economy. Some of these countries produce similar types of agri-food products and, therefore, compete in the European and World markets. In addition, most of these countries have a similar structure of agricultural production, and similar educational levels among employees in agriculture, percent of rural population, and government programs implemented in the last ten years. However, nearly every country has unique characteristics concerning agricultural production and place within the world market.

We expect that our results will be conducive to determination of the most efficient production patterns according to regional specifics and specialization. During the last 10 years, the level of specialization in different countries has changed in different directions. The new members of the EU start to differentiate the structure of the economy. On the contrary, Ukraine, Moldova and Belarus change the structure of their economies not so fast and continue to consider agriculture as one of the main sectors. On one hand, this tendency is quite negative relative to the pace of development of the neighbouring countries. On the other hand, the agricultural specialization gives Ukraine the chance to become a big player in some segments of the world market (cereal, corn, rapeseeds, etc.) and use the actual tendencies in the world market for own development of agriculture and rural areas based on business opportunities (as opposed to the supported agriculture in Europe).

Table 2. The main importing countries (by 6 main crops), 1999-2008

Countries	(US$ '000)				
	1999-2001	2003-2005	2006	2007	2008
Japan	3.753.506	4.721.895	4.729.272	6.636.852	10.366.315
Mexico	1.642.497	1.929.275	2.442.928	3.106.248	4.563.281
Korea, Republic of	1.509.461	1.973.381	2.073.722	2.854.524	4.370.049
Iran, Islamic Republic of	1.397.523	884.016	785.122	1.069.568	4.054.894
Saudi Arabia	1.077.861	1.523.270	1.978.735	3.266.150	4.040.148
Spain	949.182	1.786.860	2.015.545	3.106.985	3.884.051
Algeria	990.848	1.310.094	1.385.953	1.829.017	3.623.707
Netherlands	873.582	1.278.531	1.588.185	2.780.442	3.584.093
Italy	1.317.013	1.771.605	1.893.495	2.803.324	3.523.666
Egypt	1.268.680	1.290.307	1.550.840	2.541.672	3.509.878
United States of America	994.594	913.042	1.218.715	1.734.667	2.934.005
China	1.627.809	2.661.436	2.150.668	2.229.982	2.831.137
Germany	622.985	928.210	1.102.182	2.039.088	2.754.144
Belgium	818.122	1.100.685	1.199.962	1.957.414	2.701.933
Brazil	1.284.900	1.174.551	1.491.186	2.007.410	2.672.114
Indonesia	1.219.599	1.125.625	1.372.348	1.985.046	2.471.205
Morocco	686.439	728.998	614.152	1.727.639	2.253.767
Turkey	324.383	468.515	167.492	973.273	2.137.842
Malaysia	625.803	732.952	975.821	1.315.944	2.009.613
United Arab Emirates	462.214	434.667	657.931	971.601	2.007.471
Iraq	931.035	749.549	1.090.419	1.147.005	1.915.482
United Kingdom	722.027	842.312	878.946	1.343.258	1.732.320
Colombia	411.536	605.582	868.657	1.192.858	1.654.349
Philippines	628.627	705.927	1.150.867	1.393.966	1.581.808
Yemen	278.825	433.861	587.125	910.127	1.320.004
France	457.365	581.662	560.847	978.804	1.286.437
Tunisia	293.005	353.040	433.234	932.034	1.216.742
Portugal	435.146	571.368	599.487	863.481	1.176.326
Peru	339.752	440.716	523.939	817.275	1.159.319
Venezuela	317.355	364.041	417.870	564.947	1.156.435
Canada	339.287	471.371	451.726	732.708	1.035.639
World	40.467.071	50.482.238	58.660.047	85.187.634	120.091.261

Source: www.fao.org, FAO Statistical Yearbook 2010.

Ukraine has its own commodities and market shares at the European and World markets and has very favorable conditions to improve its position. We have also obtained some positive trends in agricultural specialization of Ukraine relatively to its main competitors – neighboring countries (including Post-Soviet countries). Our research also shows that as far as long-term trends in comparative advantage are concerned, Ukraine will have a larger advantage in the production of unprocessed products (wheat, corn, sunflowers, rapeseeds, sunflower oil and rapeseed oil). Regional specialization of the Ukrainian agriculture heavi-

ly depends on the level of employment (in some regions more than 30% of capable people employed in agriculture) and on the historical trends (in some regions agriculture is the main industry, but GDP is extremely low). The same tendencies we observe in the other analyzed countries (Romania and Poland), but in Ukraine they are less observable than in other post-Soviet countries (Belarus and especially Moldova). Finally, as Ukraine is a large country with substantial differences in regional conditions, it would be useful to conduct the competitiveness analysis with regard to regions.

Ukraine has also developed standards physiological needs of the population of Ukraine in key nutrients and energy. Equally important are indicators of food security, quantitative and qualitative description of the state, dynamics and prospects for physical and economic access to food for all social and demographic groups, the level and structure of consumption, quality and food safety, durability and degree of independence of domestic food market, level of development of agriculture and related industries, as well as effective use of agricultural natural resources.

The whole research divided in several stages due to the fact that the study of this particular problem contains different aspects of agrarian economy and various agrarian economy instruments influence on the industry proposition in a separate country, region and in the world. The research is also related to the analysis of resources usage and analysis of economical effects depending on the country's diversification or specialization, along with the estimation of influence of a separate market on the external surrounding.

By the FAO statistics during last few years the four main crops (soybean, rapeseeds, sunflower and corn) cover more than 20 per cent of World arable lands (table 3).

Table 3.World area harvested, 2006-2009, by items and total, ha

Commodity	2006	% in total	2007	% in total	2008	% in total	2009	% in total
Maize	148340.84	10,07	158358.33	10.75	160814.58	10.92	158628.75	10.77
Rapeseed	27441.40	1.86	29887.78	2.03	30659.71	2.08	31120.57	2.11
Soybeans	95308.37	6.47	90155.97	6.12	96480.63	6.55	99501.10	6.76
Sunflower seed	23975.18	1.63	21280.72	1.44	25031.41	1.70	23716.84	1.61
Wheat	211835.82	14.38	216704.93	14.71	222740.35	15.12	225622.45	15.32
Barley	56373.89	3.83	55730.91	3.78	56281.08	3.82	54059.71	3.67
Total	1472853.00	38.24	1472853.00	38.84	1472853.00	40.19	1472853.00	40.24

Source: www.fao.org, FAO Statistical Yearbook 2010.

As we can see from the table 5, six main crops absorb more than 40 per cent of world arable land in use. It meant that exactly the same crops have to occupy at least 50 per cent in diet. And three of them (maize, soybeans and wheat) take over 33 per cent of arable lands. Another part of this problem appears in usage of crops in animal husbandry, means decreasing of food supply.

Also we still remember that any alternative energy sources program influents to market's demand and supply. On the other hand every country has to provide the energy security as well. Here the most important point is to use the all available resources (water, sun, wind, land, etc.) with the maximum effect.

Table 4. Actual and Potential arable land in World

	Total area	Potential arable land	Actual arable land	% of potent. arable land actually in use
Area	'000 km²	'000 ha	'000 ha	%
Europe	6806.00	384220.00	213791.00	55.64
North America	19295.00	479632.00	233276.00	48.64
South and Central America	20541.00	1028473.00	143352.00	13.94
North Africa and Near East	11545.00	49632.00	71580.00	144.22
North Asia	20759.00	297746.00	175540.00	58.96
Sub-Saharan Africa	24238.00	1109851.00	157608.00	14.20
Asia and Pacific	28682.00	777935.00	477706.00	61.41
World	131866.00	4127489.00	1472853.00	35.68

Source: http://www.wri.org/publication/content/8426.

Here is important to explain the results of table for North Africa and Near East – where the percentage of potential arable land in use more than 100 per cent – we do account the number of natural arable lands without usage of specific equipment (drop irrigation, etc.). Also we can see that the most potential ids the South and Central America region, but we have to mettioned that those territories in agricultural usage can cause damage to ecological balance in the region.

Following the data of World Resource Institute the potential arable land exceeds the actual arable land in use more than three times. It means that land resources can be used for development for further global food balance achivment. It is also important to consider the main World food producers and exporters, as far as both group of countries influent for world food balance.

CONCLUSIONS. Our researches shows that in modern conditions of social development, financial and food crisis, level of agri-food production doesn't depend on renewable energy. But in nearest future this problem will become to influent for food supply. So we have to evaluate the necessity of increasing the

number of arable lands and balance the production of crops for food and for energy production. The main resources have to be used accordingly to the interest of country and region, but also considering the global stability.

For Ukraine it is extreamly important to run own agricultural policy basing the principles of political trust, macroeconomic stability, sustainable agrifood production, infrastructure and stable trade policy.

In the longer run the present situation will most likely have a positive effect on the level of earnings in the sector. This might keep the agricultural workers from migrating to other regions or sectors. As a result, working conditions of those employed will also improve which is another reason for not migrating. The restructuring of Ukraine's agriculture – that has already been initiated and will be further encouraged – can be seen as a necessary phase in Ukraine's transition and development that involves – often painful – adjustments for industries, regions and/or groups of people. Mitigating measures and development plans have to address these issues to bridge the gap between the short run pains and long run benefits.

There may be no economies that absolutely satisfy the condition of a "small" country assumption in a standard trade model. The terms of trade effects are relatively significant for determining the overall welfare improvements in partial trade liberalization like that from a bilateral FTA.

References

1. "*Chapter 2. Food security: concepts and measurement"*. http://www.fao.org/docrep/005/y4671e/y4671e06.htm. Retrieved 2011-03-16.
2. "*FAO Practical Guide: Basic Concepts of Food Security"* (PDF). http://www.fao.org/docrep/013/al936e/al936e00.pdf. Retrieved November 13, 2011.
3. *"Food Security in the United States: Measuring Household Food Security"*. USDA. http://www.ers.usda.gov/Briefing/FoodSecurity/ measurement.htm. Retrieved 2008-02-23.
4. Aiginger K. et al. (1999), '*Specialization and (geographic) concentration of European manufacturing'*, Enterprise DG Working Paper No 1, Background Paper for the 'The competitiveness of European industry: 1999 Report', Brussels.
5. Akindès F., (1995), *Impact de la dévaluation du franc CFA sur la consommation alimentaire à Abidjan*. In Economies et sociétés, AG22, n°3-4/1995.

6. Atkinson S. J., (1992), *Food for the Cities: Urban Nutrition Policy in Developing Countries,* Department of Public Health and Policy, London School of Hygiene and Tropical Medicine, n°5.
7. Atkinson S. J., (1995), *Approaches and Actors in Urban Food Security in Developing Countries,* Habitat Intel. Vol. 19, n° 2. University of Manchester, United Kingdom.
8. Azoulay C. & Dillon J-C. 1993. *La sécurité alimentaire en Afrique*. Karthala, Paris.
9. Banque Mondiale, (1994),. *L'ajustement structurel en Afrique, réformes, résultats et chemin à parcourir*. Washington D. C.
10. Bencharif A., (1990), *Les mutations dans les pays en développement: autosuffisance et/ou internationalisation?* In Actes 5e Rencontres Internationales Agropolis, Montpellier, December 1990.
11. Bencharif A., (1996), *Le blé en Algérie*. Karthala, Paris.
12. Berman W.B., & Carter S., 1993. *Structural Adjustment and Trade Liberalization, its Effect on Marketing Institutions and Social Life*. Published by Network and Centre for Agricultural M Marketing Training in Eastern and Southern Africa. FAO.
13. Bricas, N. & Thuillier-Cerdan, C. 1996. *Organisation alimentaire de Cotonou.* CIRAD-SAR, Montpellier, April 1996.
14. Bricas, N. 1996. *Cadre conceptuel sur l'analyse de la dynamique de la consommation alimentaire urbaine en Afrique*. Montpellier CIRAD-SAR.
15. Brilhart M., (2001), '*Growing Alike or Growing Apart? Industrial Specialisation in EU Countries'*, in C. Wyplosz (ed.), The Impact of EMU on Europe and the Developing Countries, Oxford, Oxford University Press, pp. 169-194.
16. *Bulletin semestriel d'information sur le marché céréalier du Burkina Faso, 1996.* Ministère de l'agriculture et des ressources animales, SONAGESS, SIM. August 1996.
17. Byé P. & Frey J-P., (1995), *Destructuration productive et recomposition sociale en Centrafrique*, in Economies et Sociétés, n° 3-4, PUG, Grenoble.
18. Campbell D.J., (1990), *Community Based Strategies for Coping with Food Scarcity; a Rôle in Africa Early Warning Systems in Sahel and Horn of Africa*.. A review of the literature. IDS research report, n° 221, vol. 2 et 3, Brighton.
19. Chenery H., Ahluwalia M-S., Bell C-L., Duloy J-H. & Jolly R., (1977), *Redistribution et croissance*. Eds PUF, Paris.
20. Cheyns E., (1996), *Les pratiques d'approvisionnement alimentaire des consommateurs de Ouagadougou*, CIRAD-SAR, Montpellier, March 1996.
21. Claassen E. M. & Salin P., (1991), *The Impact of Stabilization and Structural Adjustment Policies on the Rural Sector: Case-Studies of Côte-*

d'ivoire, Senegal, Liberia, Zambia and Morocco, FAO, Economic and social development paper n° 90.
22. Cour J-M., (1994), *Analyse démo-économique rétrospective et esquisse d'image démo-économique à long terme de la région Afrique de l'ouest.* Club du Sahel/OCDE.
23. Courade G., (1996), *Libéralisation et ajustement structurel*. In Agricultures, Cahiers d'études et de recherches francophones, vol. 5, n° 4, July/August 1996.
24. DCGTX, (1988), Réseau National de marchés de gros. *Définition du programme national et termes de référence pour le choix de la localisation, la conception, l'étude de faisabilité des marchés de réseau.* Ministère du Commerce, Office d'aide à la Commercialisation des Produits Vivriers (OCPV), Côte-d'Ivoire, April 1988.
25. De Garine I., (1991), *Les changements des habitudes et des politiques alimentaires en Afrique: aspects des sciences humaines, naturelles et sociales*, CISS/CIPSH/CIUS, Ed Publisud.
26. De Lardemelle, L., (1996), *The role of local authorities in food supply in Ghana.* FAO, Rome.
27. Delisle H., (1989), *Urbanisation, demande alimentaire et production agricole: interrelations et implications.* Etude de cas: Zaïre, Cameroun, Sénégal, FAO, Rome.
28. Delorme, H., Kroll, J.C., Mehier, C. & Valeschini E., (1995), *Multilatéralisme et organisation économique régionale en Afrique francophone*. Economie Rurale, April 1995.
29. Devereux M., Griffith R. and Simpson H., (1999), '*The Geographic Distribution of Production Activity in the UK'*, Institute for Fiscal Studies Working Paper, W99/26.
30. Diop M-C., (1996), *La lutte contre la pauvreté à Dakar*. Bureau Régional pour l'Afrique, Programme de gestion urbaine. Accra, Ghana.
31. Douzant-Rosenfeld, D., Grandjean, P., (1995), *Nourrir les métropoles d'Amérique Latine: approvisionnement et distribution.* L'Harmattan.
32. Egal F., (1997), *Le comportement alimentaire des consommateurs urbains défavorisés en Afrique francophone*: *un rôle pour les SADA*? Programme FAO "Approvisionnement et distribution alimentaires des villes", Revue "Aliments dans les villes", vol. 01 - juin 1997, Rome.
33. Engelhard P., (1996), *L'Afrique peut-elle se nourrir*? In Les problèmes alimentaires dans le monde, Cahiers Français n° 278, octobre-décembre 1996, La Documentation Française, Paris.
34. Englis P., Hénault G., (1996), *Petites entreprises en Afrique: clés du changement*. Centre de recherches pour le développement international, Ottawa, Canada.
35. Etude sur la connaissance du marché céréalier, (1994),. *Enquête commerçants,* GOPA, Burkina Faso, January 1994.

36. FAO/OMS, (1992), *Amélioration de la sécurité alimentaire des ménages*. Document thématique, Conférence Internationale sur la Nutrition. FAO/OMS PRECOM/ICN/92/INF/6.
37. Frey J-P, (1995), *La chaîne alimentaire et la dévaluation en Centrafrique*, Université de Bangui.
38. FUDECO, (1996), *Guida metodológica para la elaboración del diagnóstico del sistema de distribución de alimentos en centros urbanos.* Venezuela.
39. Ghersi G. & Martin F., (1996), *Pour une approche renouvelée et intégrée de la sécurité alimentaire*. In Agroalimentaria n° 2, juin 1996, Merida, Venezuela.
40. Gnammon-Adiko A., (1997), *Le rôle des autorités locales dans les systèmes d'approvisionnement et de distribution alimentaires d'Abidjan.* AGSM-FAO, Rome.
41. Godeau R., (1995), *Le franc CFA, pourquoi la dévaluation a tout changé*. Ed Sépia, Saint-Maur.
42. Grégoire E., Labazée P., (1993), *Grands commerçants d'Afrique de l'ouest: logiques et pratiques d'un groupe d'hommes d'affaires contemporains,* Karthala-ORSTOM.
43. Griffon M., (1996), *Eviter le pire*, In La sécurité alimentaire à long terme, Courrier de la Planète/Food for Development, April 1996.
44. Griffon M., Henry P., Lemelle J-P, (1991), *Les politiques agricoles et alimentaires en Afrique, méthodes et outils d'analyse et d'aide à la décision.* Ministère de la Coopération et du Développement, Collection Méthodologie n° 29.
45. http://ec.europa.eu/agriculture/healthcheck/index_en.htm, accessed on October 27, 2008.
46. http://ec.europa.eu/food/food/intro/white_paper_en.htm.
47. http://www.fas.usda.gov/psdonline/psdHome.aspx.
48. http://www.wto.org/english/tratop_e/tariffs_e/tariffs_e.htm.
49. IFPRI, (1995), *A 2020 Vision for Food, Agriculture and the Environment*, Washington D. C.
50. Jonsson, U. & Brun, T. 1978. *The Politics of Food and Nutrition Planning in Nutrition Planning*. The state of the art, Joy L, Wood C (Eds). IPC Sciences and Technology Press Limit for USAID, London.
51. Kawasaki K., The Impact of Free Trade Agreements in Asia // RIETI Discussion Paper Series 03-E-018, September, 2007// http://www.rieti.go.jp /jp/publications/dp/03e018.pdf.
52. Kane, H. 1995. *Feeding the World's Cities.* Worldwatch Institute, Washington, October 1995.
53. Kouyaté K., Terpend N., (1996), *Contraintes des acteurs*. AGSM-FAO, Rome, May 1996.

54. Kracht U., (1995), *Short and Long Term Food Security*. Economies et Sociétés, 22 (3-4), 67-75.
55. Krugman P., (1991a), Geography and Trade, Cambridge: MIT Press.
56. Krugman P., (1991b), 'Increasing returns and economic geography', Journal of Political Economy, vol. 99, pp. 484-499.
57. Le Forestier A., (1977), *Le plan nutritionnel, solution pour demain?* Dossier Jeune Afrique, juin 1977, Paris.
58. Le Normand I., (1996), *Les facteurs de sécurité alimentaire*. In Les problèmes alimentaires dans le monde, Cahiers Français n°278, octobre-décembre 1996, La Documentation Française, Paris.
59. Malassis L., Ghersi G. (Coord.), (1992), *Initiation à l'économie agroalimentaire.* Hatier/AUPELF-UREF.
60. Malassis L., (1992), *L'économie agroalimentaire: une discipline en développement.* In Economies et Sociétés, AG 21.
61. Maxwell S., Frankenberger T. R., (1995), *Household Food Security: Concepts, Indicators, Measurements*. A technical review. UNICEF, IFAD.
62. Midelfart-Knarvik K. H., Overman F. G., Redding S. J. and Venables, A. J., (2000), 'The Location of European Industry', Economic Papers no. 142 – Report prepared for the Directorate General for Economic and Financial Affairs, European Commission.
63. Mittendorf H-J., (1978), *The challenge of Organizing City Food Marketing Systems in Developing Countries.*
64. Mittendorf H-J., (1992), *External assistance in agricultural and food marketing to developing countries: a review of the last three decades,* (shortened version for the DES workshop).
65. Montigaud J-C., (1992), *L'analyse des filières agroalimentaires: méthodes et premiers résultats.* In Economies et Sociétés, AG 21.
66. Moustier P., David O., (1996), *La dynamique du maraîchage périurbain en Afrique Subsaharienne.* CIRAD-FLHOR, Montpellier.
67. Moustier P., Leplaideur A., (1996). *Cadre conceptuel sur l'analyse des acteurs commerciaux en Afrique*. CIRAD-FLHOR/CA, Montpellier.
68. Padilla M., (1995). *Trente ans de politiques alimentaires dans la région, échecs et succès.* In Les politiques alimentaires en Afrique du Nord. Karthala, Paris.
69. Padilla M., (1996), *Les politiques alimentaires*, Traité d'économie agroalimentaire, tome 4, Ed Cujas.
70. Padilla M., Delpeuch F., Le Bihan G., Maire, B. (Eds), (1995), *Les politiques alimentaires en Afrique du Nord*. Karthala, Paris.
71. Pérennes J-J., (1994), *Villes du Nord, villes du Sud: regards sur la relation ville-campagne*. In Mondes en développement, n° 85.
72. Pinstrup Andersen P., (1995), *The supply side of global food security.* In Economies et Sociétés, AG 22, n°3-4/1995, PUG, Grenoble.

73. PNUD, (1996), *Rapport mondial sur le développement humain*. Economica, Paris.
74. Rastoin J-L., (1996), *Les systèmes alimentaires urbains en PVD*. In Agroalimentaria n° 2, juin 1996, Merida, Venezuela.
75. Report *2005/S 89-085795 by CEPS, IFW and ICPR and http://www.fao.org/docrep/005/y4671e/y 4671e00.htm.*
76. Savané M-A. (Ed), (1992), *Populations et gouvernements face aux problèmes alimentaires: regards sur des zones de l'Afrique de l'ouest*, UNRISD 92/1, Geneva.
77. Sen A., (1981), *Poverty and Hunger: Issues and Options for Food Security in Developing Countries*. World Bank Policy Study, Washington.
78. Snrech S. *et al.,* (1994), *Pour préparer l'avenir de l'Afrique de l'ouest: une vision à l'horizon 2020,* synthèse de l'étude, December 1994, p. 65.
79. Snrech S. *et al.,* (1995), *Une réflexion régionale sur les politiques de développement*, OCDE/CILSS/Club du Sahel, September 1995, p. 27.
80. Staatz J.M., D'Agostino V.C., Sundberg S., (1990), *Measuring food security in Africa: conceptual, empirical and policy issues*. American Journal of Agricultural economics, December, 1311-1317.
81. Stren R-E., White R-R. et la collaboration de Coquery M., (1993), *Villes africaines en crise: gérer la croissance urbaine au sud du Sahara,* L'Harmattan.
82. Terpend N., (1993), *Les échanges régionaux de produits et la sécurité alimentaire en Afrique de l'ouest*. FAO-AGSM, January 1993, p. 41.
83. Terpend N., (1995), *Etude de la filière cuirs et peaux au Sénégal et en Côte-d'Ivoire*, FAO, May 1995, p. 80.
84. Thomson A., Terpend N., (1993), *Promouvoir la participation du secteur privé à la commercialisation des produits agricoles en Afrique.* Bulletin des services agricoles de la FAO n°106.
85. Tickner V., (1995), *Employment and food crop/food marketing.* Food Policy, vol. 20, GAMCO-UK.
86. Touré T., (1988), Réseau National de marchés de gros, juin 1988. *Enquête sur la distribution primaire des produits vivriers à Abidjan (fiches produits, fiches marchés, fiches communes, fiches magasins)*, Côte-d'Ivoire, p. 128.
87. Wolfmayr-Schnitzer Y., (1999), '*Economic integration, specialization and the location of industries: A survey of the theoretical literature*, WIFO Working Paper No. 120, WIFO-Austrian Institute of Economic Research, Vienna.
88. World Bank and OECD, (2004), *Achieving Ukraine's Agricultural Potential: Stimulating Agricultural Growth and Improving Rural Life.* OECD and the ESCCD, Europe and Central Asia Region, the World Bank.
89. Zhemoyda O., Pavlenko O., (2008), *Place of Ukraine at the European economic integration processes// Konkurencieschopnosť a ekonomický*

rast: Európske a národné perspektívy// Zborník vedeckých prác /Slovenská poľnohospodárska univerzita v Nitre – CD, 2008 pp. 375-381 (ISBN 978-80-552-0061-3).

90. Zhemoyda O., (2007), *Prospects of regional development of agrarian production in Ukraine according to the integration processes// Annals of the Polish Association of Agricultural and Agribusiness Economists*, 2007, Vol. IX , No 1, Pp. 580-584.

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3. Exploring linkages between the Common Agricultural Policy and food security in the Mediterranean region

The Common Agricultural Policy (CAP) remains a central component of the internal policy of the European Union (EU). However, the CAP has long been criticised for its damaging effects on developing country agriculture. This paper attempts to explore the linkages between the CAP and food security in the Mediterranean region with a specific focus on southern and eastern Mediterranean countries. Even if EU's food security at short run is not threatened, the real food security challenge affects the poor and smallholders in developing countries including the Mediterranean ones. The CAP should respond to this challenge by promoting an open and stable trade regime for agricultural products. A major step would be the removal of its own agricultural tariffs and all subsidies that are not efficiently targeted at clearly defined public goods. This should be accompanied by additional support for enhancing agricultural productivity and food security in developing countries.

3.1. Introduction

Food and agricultural policy is under scrutiny. Questions are being asked about both past and present public policy and strategy. The motives for reassessment are various, including food insecurity, trade wars, health impact, ecological concerns, population growth, citizens' rights [Stephens *et al*. 2000; Lang 1999; Dyson 1996]. After decades in which policy was centrally concerned with raising productivity and production, the need for a more complex model for food and farming is becoming clear [Waltner-Toews and Lang 2000]. In a context of global competition and economic crisis, the Euro-Mediterranean agricultural sector is facing increasingly complex completive pressure arising not only from the World Trade Organisation (WTO) negotiations and from the recent enlarge-

ments of the European Union (EU), but also from the recent EU's participation in free trade areas (FTAs) [Scarpato and Simeone 2013].

According to Boysen and Matthews [2012], the *Common Agricultural Policy* (CAP) is a European policy whose *raison d'être* is to support European farmers. The CAP remains a central component of the EU's internal agricultural and social development policy. The policy's primary stakeholders (European farmers and related agricultural industries) have strong incentives to maintain its focus, budget and clarity of objectives as an internal EU policy instrument. The CAP accounts for a substantial proportion, 41% in 2009, of the EU budget. It is divided into two main categories: income support (Pillar I) and rural development (Pillar II).

The Commission, the Council and the European Parliament (EP) have reached a political agreement on the reform of the CAP. Most elements were agreed in trilogue on June 26 and the last remaining issues were finalised on September 24. Based on the Commission proposals from October 2011, the greement relates to four basic European Parliament and Council regulations for the CAP on i) Direct Payments, ii) the Single Common Market Organisation (CMO), iii) Rural Development and, iv) a Horizontal Regulation for financing, managing and monitoring the CAP. The new rules can enter into force in 2014 or from January 2015 for most of the new Direct Payment arrangements. Separate "transition rules" will be applied in 2014. The new CAP can represent a good opportunity for the development of Mediterranean agriculture (Box 1).

Box 1. CAP reform and Mediterranean agriculture.
According to De Castro and Di Mambro [2013] the CAP reform represents an opportunity for the countries of the Mediterranean side of Europe. The framework of the European support for agricultural sectors accentuates the characters of flexibility and modularity. This means that the new CAP is no longer a centralized and monolithic policy, but it will increase the "room for manoeuvre" for Member States in a support model aiming to adapt to the various European agricultures. The new CAP represents also a call to take responsibility. It will be up to the national and local governments to gear up to the best use of the new "toolbox" of the CAP, in the interests of Mediterranean agriculture.

The two main instruments of the CAP are farm income support (through the Single Farm Payment and the Single Area Payment) and market price support (through tariffs, export refunds and other subsidies). It is unclear whether these instruments have a positive or a negative impact on short-term food security. They are generally credited for keeping land and labour in agricultural production [Zahrnt 2011]. However, the CAP has long been criticised for its damaging effects on developing countries, and developing countries' agriculture in particu-

lar and, consequently, also their food security and sovereignty [e.g. Boysen and Matthews 2012].

The rules applied at the level of the European Union especially in terms of quality and safety standards influence the trade of agricultural products and commodities between the non-EU Mediterranean countries and the EU countries. With existing subsidies at the EU's level, including export subsidies, European producers have a competitive advantage with respect to Mediterranean countries that create a market distortion which is unfavourable to local producers especially smallholders that assure a high share of commodities production thus contributing to food security and poverty alleviation in non-EU Mediterranean countries.

That being said, agricultural systems both in Europe and in the Mediterranean region are facing major economic and social challenges. A central objective in both developed and less developed Mediterranean countries is to promote public goods by preserving agricultural potential. In addition, agricultural policy has the ethical commitment to ensure the world population's access to food through sustainable production processes and technologies and to improve food nutritional quality [Malorgio and Solaroli 2012].

Food security (Box 2) is built on four pillars [CFS 2012; UN-HLTF 2011]: (i) Food availability: sufficient quantities of food available on a consistent basis; (ii) Food access: having sufficient resources to obtain appropriate foods for a nutritious diet; (iii) Food use: appropriate use based on knowledge of basic nutrition and care; and (iv) Stability in food availability, access and utilization.

Box 2. Food security.
The concept of food security has been developed during the last thirty years reflecting the changes in official policy thinking [Clay 2002]. Nowadays, new dimensions have been entering into the concept of food security including the ethical and human rights dimension of food security [FAO 2006]. A widely-accepted definition of food security is that of the World Food Summit held in 1996 [FAO 1996].
According to FAO [2002], "*Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life*".
This definition implicitly includes the multidimensional nature of food security by considering more profoundly the four main dimensions (food availability, access, use and stability) required to be guaranteed in order to assure food security.

Food security remains, in both quantitative and qualitative terms, a fundamental human requirement. The cost of malnutrition is both direct and indirect. Overnutrition, like undernutrition, not only has an immediate deficit impact

on public health systems but also an indirect impact on the gradual deterioration of human capital and the inevitable loss of productivity [Hassan-Wassef 2012].

Food consumption is variably affected by a whole range of factors including food availability, food accessibility and food choice, which in turn may be influenced by geography, demography, disposable income, socio-economic status, urbanization, trade liberalization, globalization, religion, culture, transnational food corporations and food industry marketing, and consumer attitude and behaviour. These drivers have produced several social, economic, health and environmental consequences on food consumption patterns such as increase in nutrition-related diseases, social inequalities, loss of biodiversity, climate change, fish stocks depletion, etc. [Kearney 2010].

The issue of access to and availability of food on a global basis has been making headway on the political and media agenda since the start of the twenty-first century. What now gives cause for concern is the increase in food prices levels and volatility. Since the mid-1990s we are observing sharp peaks in farm commodity prices (e.g. 2007/2008 and 2010/2011). The most recent forecasts indicate a sizeable rise in prices for the coming years. Most academics agree that the long era of abundant food, available at low prices, is over and has given way to an era of new scarcity. Food availability is fundamentally dependent on food production, but this can be local or distant. If distant, local food availability also depends on trade systems, and on packaging, transport and storage [Ingram 2011].

In tackling the issue of security in the food supply the analysis of population dynamics has given way to examination of distribution dynamics. The problem, as posed in recent years, is not scarcity but the inequitable distribution of food resources, which has ended up penalizing vast populous areas in the world [De Castro *et al.* 2012]. Such a problem has recently been aggravated, leading the number of undernourished people worldwide to exceed one billion. Though inter-related with the broader issue of natural resource depletion, food scarcity assumes connotations of greater or equal urgency compared with numerous delicate problems, such as market instability and price volatility, conveyed more loudly by public opinion. The international markets for agricultural commodities are the stage on which the new scarcity is shown in all its clarity.

One of the main drivers of food market instability is the headlong growth in food consumption, associated with population growth but, especially, with the higher purchasing power among increasingly broad ranges of the population in emerging countries. As early as the mid-1990s, major increases were being witnessed in the demand for some strategic agricultural commodities, such as wheat. The current period of structural food scarcity manifested in a progressive

widening of the scissors between food availability and demand against a trend of price rises.

Government reactions to price booms have aimed to stabilize domestic supply as rapidly as possible by adopting protective measures (such as bans on exports or incentives for imports), to alleviate the impact of increases upon its citizens. Yet these initiatives have had the sole result of exporting instability, taking it from national to international markets [Tangermann 2011], amplifying price oscillations and triggering a vicious circle which made the markets even more precarious. The scenario is further complicated by the state of reserves of strategic agricultural products. Today, the level of food reserves is much lower than in the past. This actually made the agricultural supply even more inelastic than it is naturally, further restricting the capacity to respond to price increases
Recent events around the globe in general and in the Middle East and North Africa (MENA) region in particular (cf. the Arab Spring) have put more attention and pressure onto food security. Therefore, it appears necessary to engage even more in strengthening and furthering research and political actions in sustainable food consumption and production in the Mediterranean region [Hassan-Wassef 2012].

In such a complex, evolving, and risky context, the analysis of interconnections between food security and agricultural policies is to be conducted for deepening the understanding of structure of current risk management strategies.

The EU has committed itself to greater policy coherence for development in its non-aid policies, including agricultural policy. To evaluate its success in moving towards policies that are more coherent with its development cooperation objectives, estimates of how the CAP currently affects food security in developing countries are needed.

The work aims at exploring linkages and relations between the CAP and food security in the Mediterranean region with a specific focus on southern and eastern Mediterranean countries (SEMCs).

3.2. Material and Methods

The paper is mainly based on a secondary data review. Sources of secondary data include: International Food Policy Research Institute (IFPRI), FAO - FAOSTAT, International Centre for Trade and Sustainable Development (ICTSD), European Commission, Overseas Development Institute (ODI), European Centre for International Political Economy (ECIPE), International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), Barcelona Centre for International Affairs (CIDOB), European Institute of the Mediterranean (IEMED), The Economist, World Bank, etc.

The trends of different direct and proxy indicators of food security were analysed: Global Food Security Index (GFSI); Global Hunger Index (GHI); cereals import dependency ratio (CIDR).

The Global Food Security Index (GFSI), developed by the Economist Intelligence Unit, considers the core food issues of affordability, availability, quality and safety across a set of 105 countries [The Economist 2012].

The Global Hunger Index (GHI) is a multidimensional statistical tool developed by IFPRI to describe the state of countries' hunger situation. The GHI measures progress and failures in the global fight against hunger. It is updated once a year since 2006 [IFPRI and Welthungerhilfe 2006].

The paper analyses trade of agro-food products between the EU and non-EU Mediterranean countries. Moreover, there was a special focus on agricultural situation and agro-food trade in three southern Mediterranean countries (SMCs): Egypt, Morocco and Tunisia. The paper provides also an overview on types of trade agreements existing between the EU and developing countries and their expected and potential impacts on poverty in general and food security in particular.

The analysis of imports dependency in non-EU Mediterranean countries focuses on cereals as most of the Mediterranean countries are net cereal importers and also given the importance of cereals, especially wheat, for the food security status of the population in these countries. The cereals imports dependency ratio (CIDR) allows knowing how much of the available domestic cereal supply has been imported and how much comes from the country's own production [FAO 2001]. Data source is the Food security indicators [FAO 2013] based on elaboration of original LABORSTA data.

As far as non-EU Mediterranean countries are concerned, the geographical coverage of this study is similar to that of the Mediterranean Strategy for Sustainable Development including 3 Balkan countries (Albania, Bosnia and Herzegovina, and Montenegro) and 9 Southern and Eastern Mediterranean countries (Algeria, Egypt, Lebanon, Libya, Morocco, Palestinian territories, Syria, Tunisia and Turkey).

3.3. Result and Discussion

Linkages between the CAP and food security in developing countries

The CAP has long been criticised for its damaging effects on developing countries' agriculture and food security [Boysen and Matthews 2012]. In fact, when world prices increase, mechanisms such as EU quotas (e.g. milk) reduce the production of EU farmers and further increase prices. When prices are decreasing, CAP mechanisms such as export subsidies increase EU farmers' pro-

duction and further accelerate such price decreases. CAP instruments thus stabilise EU farmers' income but accentuate price volatility at world level [Cantore 2012]. Even if EU food security is not threatened, it is still possible to argue that the EU should massively invest in agricultural production as it has a moral responsibility to help feed the world. However, the current subsidy and tariff levels result in massive direct costs and indirect impacts, via trade, on food security in developing countries [Zahrnt 2011].

By fostering competitiveness and exports of the European agribusiness, the EU ignores the main challenge for food insecure countries today: the reduction of their import dependency. In fact, since the 1980s, the majority of developing countries switched from net exporters to net importers of food. Nowadays, two thirds of them suffer from food trade deficits and growing expenses for purchases of cereals, dairy products and vegetable oils on the world market. In order to reduce their vulnerability against price spikes and recurrent food crises, these countries urgently need a policy shift that fosters domestic agricultural production and limits import dependency. Given Europe's international responsibility in the fight against hunger, the EU should make every effort to support such a shift. But, unfortunately, the CAP in its present form heads in the opposite direction. It deepens import dependency in the South to secure export markets for the European food industry [Fritz 2012].

Trade has an important role to play in improving food and nutrition security as lowering trade barriers reduce domestic food prices and afford consumers a greater variety of food products [WHO and FAO 2003]. However, some critics argue that trade liberalization may reduce a country's food security by impacting domestic agriculture [WHO 2012]. Policies of trade liberalization over the past two decades have facilitated the "nutrition transition" [Kearney 2010]. In high-income countries, food production subsidies and related interventions act as a disincentive to efficient global food production, raise consumer prices in protected countries, and are ultimately harmful to global food security [Foresight 2011a].

Agricultural trade liberalization has complex ramifications for low-income countries, depending on whether they are currently net food producers or food consumers, and on the state of their agricultural, economic and physical infrastructure. Where a country has access to world markets and favourable factors of production it may be an immediate beneficiary of further multilateral liberalization. Where these conditions do not exist or where the country has been a historical beneficiary of 'preferential trade agreements', the effect is more uncertain. As prices in global markets are generally lower, the urban poor usually benefit. However, an uncontrolled and rapid influx of imports may also suppress investment in local food production. Indeed, the poorest countries that have

failed to establish a productive agricultural sector may find it very hard to catch up with other low-income countries that have capitalized on cheap labour and their natural capital and can now export low-cost food. Export subsidies leading to the dumping of food surpluses by high-income countries is a further problem [Foresight 2011].

All trade agreements are aimed to speed up trade liberalization. This liberalization should, on the long run, increase productivity and thus reduce poverty. A result of trade liberalization is the improvement of agricultural inputs and equipments and the strengthening of international competition. As a result, the domestic agricultural sector will become more efficient and, therefore, competitive. This in turn enforces small-scale farmers to improve their performance or to give up. Nevertheless, it might be remarked critically that such a selection process brings the agricultural sector, or the smallholder's subsector, ahead but not necessarily all the involved smallholders as they might be driven out of the market [Winters 2005].

Different kinds of trade agreements regulate trade of agro-food products between the EU and developing countries (Box 3). It can be noticed that the stated utmost objective of all types of trade agreements is, also, to achieve food security in these countries either directly (by improving food availability, food access and/or food utilisation) or indirectly by fostering socio-economic development and poverty reduction.

It would be worthwhile to think about improving agriculture performance in developing countries without forcing some of smallholders to leave their farms. As the poorest households, especially rural ones, may be less able than richest ones to protect themselves against adverse effects or to take advantage of positive opportunities created by policy reform, the relevant governments will have to play an important role for complementary policies to accompany trade reforms [Winters 2005]. Governments should be aware that for most developing countries both Doha and EU- agricultural trade liberalisation are likely to affect income distribution between urban and rural areas [Winters 2005]. Moreover, the largest poverty reduction impact of agricultural trade liberalisation, in both absolute and relative terms, are in countries with agricultural export potential to the markets that liberalize most; that is, East Asia and Europe [Hertel and Winters 2006].

Box 3. Trade agreements established by the EU with developing countries.
The EU's *Generalised System of Preferences* (GSP) is a trade arrangement through which the EU provides preferential access to the EU market to 176 developing countries and territories, in the form of reduced tariffs for their goods when entering the EU market. There is no expectation or requirement that this access be reciprocated. GSP covers separate preference regimes: the standard GSP and the special incentive arrangement for sustainable development and good governance (known as GSP+). Preferential tariff rates when exporting to the EU market enable developing countries to generate additional export revenue to support them in developing jobs and reducing poverty.
Everything But Arms (EBA) is an EU initiative to open borders without restrictions to exports originating in the Least Developed Countries (LDCs). EBA provides Duty-Free and Quota-Free access for products from the LDCs. This trade agreement was set up based on the insight that increased trade with developing countries enhances their export earnings, promotes their industrialization and encourages the diversification of their economies.
Economic Partnership Agreements (EPAs) between the EU and African, Caribbean and Pacific (ACP) group of countries are aimed at promoting trade between the two groupings and - through trade development - sustainable growth and poverty reduction. The EPAs intend to integrate ACP countries into the world economy and share in the opportunities offered by globalization. EPAs go beyond conventional free-trade agreements, focusing on ACP development, taking account of their socio-economic circumstances. Since first January 2008 EPAs opened up EU markets fully.
There is some evidence that the EU‘s GSP preferences can be effective in increasing LDC exports and welfare. Furthermore, there are some significant trade and output effects for a sub-set of agricultural commodities and regions (e.g. sugar products, oils and fats in North African EBA beneficiaries) [Gasiorek *et al.* 2010].

Trade aspects need to be considered in the context of improving diet, nutrition and the prevention of chronic diseases. Equitable trade has an important role to play in achieving food and nutrition security [WHO and FAO 2003]. Trade policies need to be modified to ensure also socially and environmentally responsible use and trade of land (and water), thereby ensuring that communities that are dependent on local natural resources can retain access to land and other natural resources in order to sustain their livelihoods [GLOBAL 2000 *et al*. 2013].

Food security in southern and eastern Mediterranean countries: a critical analysis

In September 2000, 189 nations approved the “United Nations Millennium Declaration” (UNMD), which calls for halving by 2015 the number of people who live on less than one dollar a day. The Millennium Development Goals (MDGs) pointed out by the UNMD include eight priorities. Eradicating extreme

poverty and hunger is the first millennium development goal to be achieved. Poverty affects food affordability thus overall food security. That's shown in a particular way by the multifaceted relations between food prices and poverty [De Hoyos and Medvedev 2009; Bussolo *et al.* 2009].

What emerge applying the upgraded $1.25-a-day poverty line, which is used to measure progress toward the first MDG, is that official poverty rates in most south Mediterranean countries are lower than in many other low- and middle-income countries (LMICs). Extreme poverty affects less than 3% of the population. But going depth in the analysis of non-income MDG indicators the situation change and the difference between South Mediterranean countries and other LMICs appears less pronounced [Breisinger *et al.* 2012; World Bank 2012].

Poverty and food security are strongly linked. Food and nutrition security in SMCs today is not so much a problem of calories, but of lacking vitamins and other micronutrients [CIDOB 2012]. In most Mediterranean countries, food security seems assured for now in quantitative terms, as less than 5% of the population is in a chronic malnourished state (in terms of energy intake), although this apparent security relies on imports. According to FAO's criteria, based mainly on a serving's calorie content, Mediterranean countries are not in critical condition nowadays. Indeed, less than 5% of the population in these countries is below 2400 kcal/day/person [Rastoin and Cheriet 2010]. However, the countries in the eastern and southern Mediterranean are only just overcoming food insecurity or still have pockets where the food situation is precarious [Padilla *et al*. 2005]. The main issue of food and nutrition security in SEMCs is undoubtedly a public health issue. The drift in the food consumption pattern caused by the globalization of agro-industrial products causes a slow emergence of true pandemic potentially very costly in human, social and economic terms [Rastoin and Cheriet 2010].

Food security is affected by food availability so agricultural production. Although SEMCs have made considerable efforts to improve their agricultural conditions, they continue to struggle with a poor endowment of cultivable land and water. In spite of the building of dams, grain yields remain low in Morocco, Tunisia and Algeria. Yields are higher under irrigation. Agriculture is still the main livelihood of a substantial part of the poor in the region. Though the share of agriculture in total employment is declining, agricultural employment still accounts for over 30% of the total labour force in Egypt and almost 30% in Morocco. About 70% of the poor in SEMCs live in rural areas. Agricultural production has increased in the region due to the efforts to enlarge the irrigated agricultural area. Nevertheless, it is variable due to harsh weather conditions. Food consumption continues to grow in a context of demographic change and

urbanization. However, demography in the region is quite varied, with populations in the Maghreb countries growing a little over 1% annually, and significantly higher growth, about 2% annually, in Egypt.

There is an increasing consensus on the need to pay greater attention to the agricultural sector to enhance food security and development in SEMCs. Countries in the region have applied a range of programs that continue to include market interventions such as the management of food reserves, export restrictions, changing tariffs, taxes on fuel use and cash programs to keep food prices relatively low. Beyond short-term policies, strategic options can be considered in order to achieve food security and alleviate rural poverty. A policy brief prepared by García Álvarez-Coque [2012] calls for a policy agenda with a egional perspective, very different from the fragmented approaches that have dominated the history of Euro-Mediterranean policies. In SMCs, policies to protect Mediterranean products and to promote traditional products are not well implemented, nor do they devote significant attention to the nutritional aspects of diet. Trade policy in these countries is geared to improving quality standards for products intended for the export market in order to ensure greater market access [Malorgio and Solaroli 2012].

The agricultural situation is not the same for all countries in the Mediterranean Southern shore. Let us consider three cases: Egypt, Morocco and Tunisia (Box 4).

Box 4. Agricultural situation in Egypt, Morocco, and Tunisia.
In *Egypt*, over the period 2007-2011, the agricultural exports decreased from 2887 million US$ in 2010 to 2774 million US$ in 2011, associated with a decrease in its share in total exports from 11% to 9%, respectively. It seems that the onset of 25th of January 2011 revolution had negative impact on agricultural exports. The coverage of exports earnings to the imports bill (either total or agricultural) also decreased over the period 2011-2012. About 91% of the farm holdings in Egypt are of less than 2 ha which hinders agricultural development [Soliman and Bassiony 2012].

Box 4. (cont.)

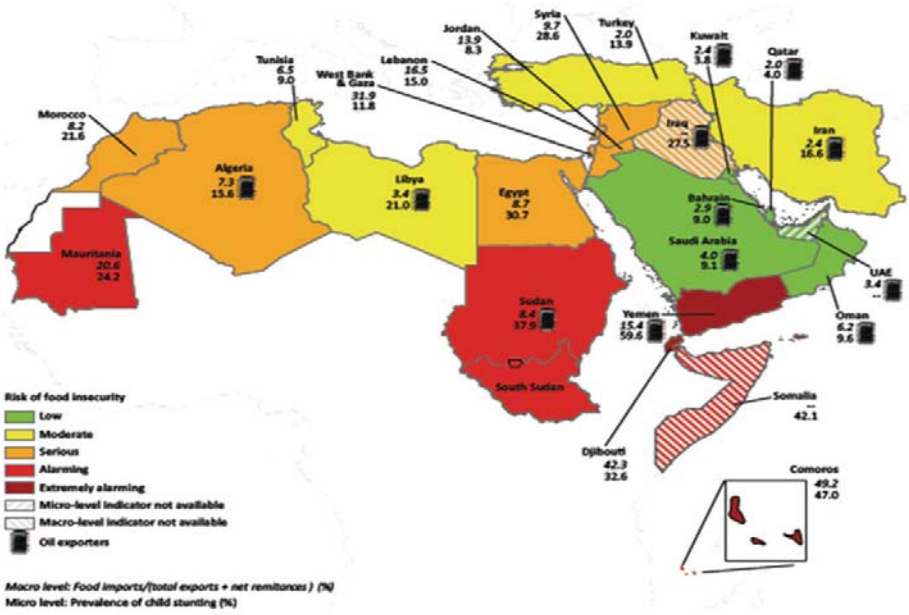
Morocco has relied on agriculture for its economic development but its performance has been below expectations. Morocco's agriculture has clear advantages in land and labour, a long producing season, relative proximity to EU markets, and trading relationships with European countries, especially France. A dynamic exporting cluster is combined with a traditional agriculture [Ministère de l'Agriculture et de la Pêche Maritime 2011; García Álvarez-Coque 2012; Akesbi 2012]. Morocco's agricultural potential is restricted by severe dry conditions in many regions, over-exploitation of water resources, inadequate irrigation techniques, weak farm structures, complexity of the land tenure system, illiteracy, unequal land property, weak institutional capacity, insufficient extension, research and marketing services, weak farming structures and high dependency on few export commodities and export destinations [Channing and Tyner 2003; Azzouzi and Abidar 2005; García Álvarez-Coque 2012]. Since 2008, Morocco is implementing the Green Morocco Plan (GMP) as a major tool to reduce poverty and to improve agriculture competitiveness [African Development Bank 2012].

In *Tunisia*, significant deep reforms have already been undertaken in the agricultural sector. Among the reasons which are frequently advanced by public authorities to justify their intervention in agriculture, some are economic in nature aiming at enhancing growth and development in the sector such as the support to investment in irrigation infrastructure. Other reasons have to do with strategic considerations to bring about social stability, such as the search of food security by maintaining low consumer prices of basic food commodities and providing support to farm income. Therefore, the intervention of the public administration is still heavy in Tunisia.

The results of a study conducted by IFPRI in 2012, point out how poverty and income inequality in the SEMCs' context are likely higher than official numbers have long suggested[46]. The main result of the study is a classification of SEMCs into five food insecurity risk groups (Figure 1). This approach goes beyond the traditional micro aspects put at the basis of the Global Hunger Index (GHI), calculated each year by IFPRI. Combining the number of times that total exports cover food imports with the food production per capita, the GHI, and Gross National Income per capita, Breisinger and other authors have proposed a food security countries classification in which all the South Mediterranean countries considered are included in the category of countries facing a food security challenge [Breisinger *et al.* 2012].

[46] In the study a new indicator of food insecurity risk is developed, merging a macro-level and a micro-level measure of food insecurity. The first one is defined as the share of food imports divided by total exports plus net remittance inflows [Food imports/(total exports + net remittance inflows)], while the prevalence of child under nutrition is used for representing the micro-level measure of food insecurity.

Figure 1. The risk of food insecurity in SEMCs



Source: Breisinger et al. [2012].

The scores for some selected North Africa and Middle East countries, in comparison with the six countries at the bottom of the world list in 2010, show that the situation of SMCs is relatively good and widely differs from the situation of those Sub-Saharan African countries that suffer the most from food insecurity. All SMCs are classed, in 2010, in the category of countries with low hunger levels, with the exception of Morocco and Syria, which appear with moderate hunger levels. The best scores among the SMCs correspond to Tunisia, and the worst to Morocco[47].

Although SEMCs do not appear as a priority on the global map of hunger, they remain as hotspots of unrest. It would be excessive to describe as bread riots the Arab revolutions but social unrest have surely something to do with food prices and dependence. Budgetary social transfers have been usual in the region but largely ineffective and expensive. Subsidies frequently fail to stabilize food prices and do not seem sustainable [Abis 2012]. Defining a coherent agricultural development strategy remains necessary in order to promote food security with-

[47] This is to a large extent explained by the fact that the prevalence of underweight children under five years of age has increased in Morocco between the periods 1988-92 and 2003-08 to reach 9.9%.

out resorting to a blind subsidization of food consumption. Universal subsidies could be replaced by targeted food subsidy programs that make food more available to selected households located in poor areas, school food programs, food-for-work programs, and focused cash transfer programs. The agricultural sector would also benefit from regulatory reforms to reduce constraints on the land market, the capital requirements for starting business and the access to credit. Priority has to be given to building capacities to provide farmers with adequate information and training.

The *Global Food Security Index* (GFSI) - considering the core issues of affordability, availability, quality and safety - shows that food security is still a challenge in SEMCs (Table 1). That is shown by the low values of the different components of the score as well as the bad ranking of SEMCs.

Table 1. Global Food Security Index (GFSI) in some SEMCs (2012). Best score is 100

Countries	Overall score	Affordability	Availability	Quality and safety	GFSI Rank/105
Algeria	40.1	38.2	39.1	47.6	72
Egypt	50.4	38.1	59.8	55.3	52
Morocco	49.1	49.5	47.5	52.6	57
Syria	40.9	33.6	44.9	47.9	70
Tunisia	52.2	52.0	48.6	63.0	49
Turkey	62.2	55.6	66.6	66.2	33

Source: The Economist [2012].

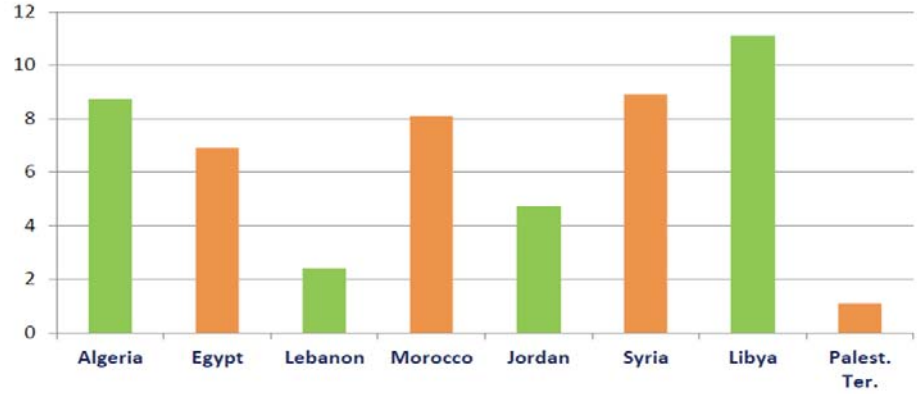
A factor that is becoming more and more crucial in measuring the multiple dimension of the concept of food security is the exposure to food import. The South Mediterranean region is one of the most food import-dependent areas in the world, with net food imports accounting for 25-50% of national consumption. This result is a consequence of a very rapidly demographic growth in the last few decades combined with the change in consumption patterns linked to the increasing average income. A direct consequence of this development has been the rising external food trade deficits, that if in general should not mean self-sufficiency deficit[48], in the cases of some SMCs rises some concerns, relat-

[48] Food trade deficits may be an acceptable way of guaranteeing the availability of food supplies but only under the condition that deficit-prone countries are able to generate enough foreign currency to pay for their imports.

ed to the high ratio of food imports over total exports. In particular, in those countries characterized by a high dependence on export earnings from oil, the exposure to food security risks is directly related with the oil price fluctuations. The quota of total exports used to pay for imports is in SMCs higher than the world average. The food dependence is more pronounced for Palestinian Territories, Lebanon and Egypt than in the other countries of the region (Figure 2).

Food dependency in SEMCs has a lot to do with the agricultural constraints especially low yields in rainfed areas. In addition, lack of transport infrastructure makes it difficult for any surplus to be sold in cities. Trade reforms have also increased the pressure on traditional production systems. The region is exposed to the increasing world market volatility. The dependency problem is paradoxically aggravated by the emergence of the middle classes, prone to change their diets and consumption patterns. This has been a consequence of economic growth and, at the same time, a reflection of the failure of agriculture to meet the food needs of the population. The direct consumption of cereals has been declining and is being replaced by an indirect consumption of products of animal origin.

Figure 2. Total export/food import in selected SEMCs (2012).



Source: Breisinger et al. [2012].

Nevertheless, cereals consumption is still relevant in all Mediterranean countries especially in southern and eastern Mediterranean ones. In fact, according to FAOSTAT data in some Mediterranean countries as high as 50%, and even more, of the dietary energy comes from cereals, especially wheat: 64% in Egypt, 62% in Morocco, 56% in Algeria, 49% in Turkey, 49% in Tunisia, 48% in Palestine, 43% in Libya, 42% in Albania, 34% in Lebanon, and 30% in Bosnia and Herzegovina.

Cereals imports dependency ratios give an idea about the level of exposure to global food price changes, which is strongly linked to food affordability and accessibility. Cereals imports dependency ratios (CIDRs) are high in SEMCs (Table 2). The average cereals imports dependency ratio in the Mediterranean countries was 61% in the period 2007-09; that is much higher than the world average in the same period (15.7%). In the period 1990-92/ 2007-09 the ratio ranged between 4.0% recorded in Turkey (2004-06) and 99.1% recorded in the Palestinian territories (1994-96). CIDRs are particularly high in North Africa (49.9%), with respect to a developing countries' average of 15.5% in the period 2007-2009.

Table 2. Cereals imports dependency ratios in selected SEMCs

Regions/countries	1990-92	1992-94	1994-96	1996-98	1999-01	2001-03	2004-06	2007-09
Albania	35.2	45.5	35.1	42.1	45.7	49.2	51.1	45.4
Algeria	62.4	76.1	68.5	3.7	9.7	71.5	66.4	70.7
BiH	-	-	24.1	26.0	33.6	33.0	36.0	37.1
Egypt	37.9	37.0	37.9	36.9	35.6	35.0	32.8	35.5
Lebanon	89.4	90.9	89.7	90.3	88.2	87.9	85.3	88.5
Libya	89.9	91.9	91.4	90.5	91.3	90.2	91.5	91.8
Montenegro	-	-	-	-	-	-	-	94.7
Morocco	27.2	35.6	27.8	32.2	59.5	44.0	36.8	53.6
PT	-	-	99.1	95.8	96.1	92.1	93.9	96.1
Syria	30.3	16.5	10.2	12.5	21.7	16.8	33.1	49.1
Tunisia	35.0	44.5	58.8	49.6	66.9	70.8	56.9	60.2
Turkey	5.3	4.5	7.7	10.7	7.6	8.5	4.0	13.8
World	14.6	14.3	14.2	13.8	15.2	15.7	15.3	15.7
DC	13.2	13.5	13.9	13.7	15.2	15.5	15.4	15.5
North Africa	43.2	47.7	44.9	43.6	52.8	48.8	44.7	49.9

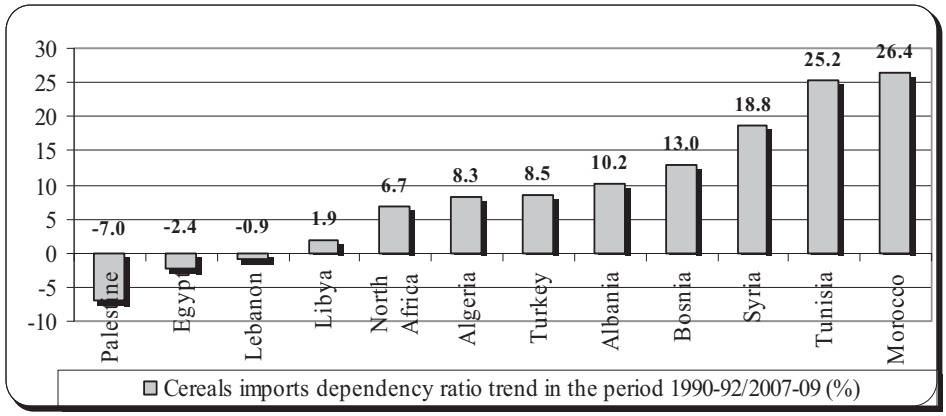
BiH: Bosnia and Herzegovina; PT: Palestinian Territories; DC: Developing countries.
Source: FAO [2011].

The Middle East and North Africa (MENA) region is the most food import-dependent region in the world, and net food imports are projected to rise even further in the future. With less than 5% of world population, the region accounts for more of 12% of cereal global trade [Rastoin and Cheriet 2010]. North Africa's share in total world imports of cereals is around 16-17% whereas its share of total population is only 2% [Petit 2009]. This high reliance on imported food can be attributed to both demand- and supply-side factors. Demand-side factors include rising population and changing consumption patterns due to higher income, whereas supply-side factors include limited natural resources such as land and water [Breisinger *et al*. 2010]. Not surprisingly - given their population - Algeria, Egypt and Turkey have the largest consumption (a total of

more than 110 million tons for those three countries) but whereas Turkey is practically self-sufficient, Algeria imports more than 80% of its domestic consumption, while Egypt is in an intermediate situation since domestic production contributes about 40% of domestic needs [Petit 2009].

What is more alarming is the fact that cereals imports dependency ratios are increasing in the majority of SEMCs. The only exceptions are the Palestinian Territories, Egypt and Lebanon, where the ratios slightly decreased in the same period. Nevertheless, these results should be taken with caution as the cereals import dependency ratios remain high to very high in these three countries (35.5% in Egypt, 88.5% in Lebanon, and 96.1% in the Palestinian Territories in the triennium 2007-09). Increases were higher than 20% in Tunisia and Morocco. Therefore, cereals, especially wheat, prices increase can have dramatic impacts on southern and eastern Mediterranean consumers as cereals per capita consumption is significant (Figure 3).

Figure 3. Cereals imports dependency ratios trend in SEMCs, period 1990-92 / 2007-09. Trend in Bosnia refers to the period 1994-96/2007-09



Source: Authors' elaboration based on FAOSTAT data.

CAP and food security in SEMCs: focus on Egypt, Morocco and Tunisia

Agricultural negotiations are presented as an open question in the Mediterranean area. When the Euro-Mediterranean partnership was launched in Barcelona in 1995, agriculture was afforded special treatment. The creation of a free trade area between the EU and SMCs envisaged its implementation through the progressive elimination of commercial barriers [Scarpato and Simeone 2013].

Agricultural trade liberalization policies may help reduce food prices to consumers but might hurt producers' welfare. This is exemplified by the differentiated impacts of the Euro-Mediterranean Free Trade Area on the different SEMCs and even single sectors within the same countries [Ahmad *et al*., 2007] (Box 5).

Box 5. Sustainability Impact Assessment of the Euro-Mediterranean Free Trade Area [Ahmad *et al*. 2007].

A sustainability impact assessment (SIA) study undertaken to assess the economic, social and environmental impacts of the evolving Euro-Mediterranean Free Trade Area (EMFTA) indicated that the EMFTA can help to deliver large economic benefits to both the EU and Mediterranean Partner Countries (MPCs), but only if carried out as part of a comprehensive development strategy in each of the partner countries, in combination with measures to achieve fuller economic integration across the region as a whole. In the absence of such strategic measures, the economic benefits of the EMFTA are small, and may be accompanied by significant adverse social and environmental effects.

The potential economic benefits of fuller regional integration can in principle help partner countries adapt to globalisation and deliver significant gains to businesses and to all sections of society, without jeopardising the natural environment. In terms of direct effects on consumer welfare the economic impacts in MPCs are generally positive and larger than in the EU, although a small short term negative effect is possible in some countries. For agriculture gain averages about 0.5% of GDP with a small additional impact from south-south liberalization.

Some social impacts in MPCs are beneficial in the short term as well as the long term and others may be significantly adverse unless effective mitigating action is taken. In the absence of appropriate preventive and mitigating measures, the potential negative social impacts of greatest concern are: a significant short term rise in unemployment; a fall in wage rates associated with increased unemployment; a significant loss in government revenues in some countries; greater vulnerability of poor households to fluctuations in world market prices for basic foods; and adverse effects on the status, living standards and health of rural women, associated with accelerated conversion from traditional to commercial agriculture.

Trade of agro-food products between the EU and the Mediterranean area is quite fluctuating. However, in general the EU's exports are higher than its agro-food imports so it has a positive food trade balance. This is particularly true in the case of cereals (Figure 4).

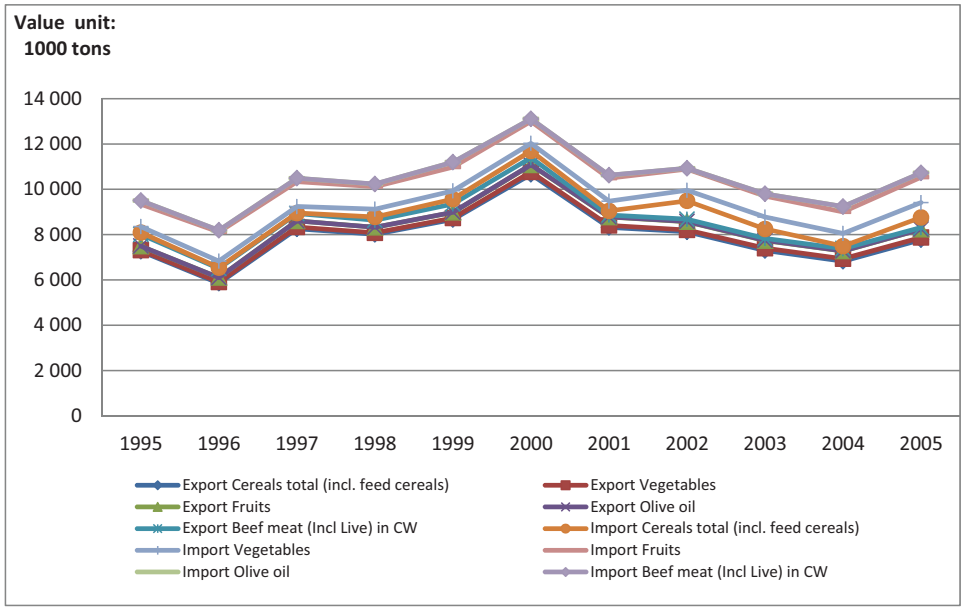
EU exports to Mediterranean Partner Countries (MPCs) are much more diversified than the reverse trade flow from MPCs to the EU. Petit [2009] reported that admittedly cereals, dairy product and sugar represent 44% of EU exports but the three leading categories in MPCs' exports to the EU, namely fruits,

vegetables and preparations based on these two fresh products, represent 54% of MPCs' exports, oils and fats as well as fish and seafood representing 10% each. Furthermore, the great differences among products in these two trade flows illustrate a great degree of complementarity between the two trading blocks, trade being thus the result of specialization. But it also reflects a low degree of economic integration across the two sides of the Mediterranean region.

The fragmentation of trade flows between EU and MPCs affects the cereal supply/use balance in each one of the MPCs. The extreme diversity of situations for a very important category of products [Petit 2009].

The fragmentation of trade also affects MPCs' exports of fruits and vegetables giving the main fruits and vegetables exported by each MPC and the share of that product in the country's agricultural exports. Another cause of fragmentation is linked to the bilateral nature of the trade arrangements between MPCs and the EU, which takes a large share of their exports. For the European Union, the politically sensitive sector is that of fruits and vegetables. This is reflected in the level of protection and, more importantly, in the diversity and complexity of the protection instruments used (e.g. Seasonal quotas and tariffs, threshold prices, and a host of preferential arrangements, often country by country, related to individual instruments, etc.) [Chevassus-Lozza *et al.* 2005].

Figure 4. EU15-Mediterranean area trade in values and quantities



Source: Our elaboration from European Commission - Directorate-General for Agriculture and Rural Development agricultural trade statistics [2012].

Although the agricultural Euro-Mediterranean trade agreements have established progressive liberalization, the presence of numerous technical barriers imposed by EU on SMCs represents a strong limitation to the liberalization process. The process of Euro-Mediterranean integration in agriculture has been very complex. The main reason is that agriculture, especially the fruit and vegetables sector, has been, and still is, one of the main sources of conflict in the relations between the EU and the SMCs [Scarpato and Simeone 2013]. The trade regulations of the fruits and vegetables sector, with particular reference to the entry price scheme which is aimed to prevent low-priced imports and to stabilize the EU internal market. As pointed by Cioffi *et al*. [2011] and Santeramo and Cioffi [2012], the entry price system barely helps to stabilize the EU's internal market, therefore its removal might be desirable. Moreover, the entry price removal would boost rural employment in SEMCs (especially in Morocco) by offering them easier access to the EU market.

Egypt, Morocco and Tunisia have evolved from a preferential trade status towards an Association status, with advanced status for Morocco and Tunisia. All of them enjoy duty free access to the EU market for industrial products and preferential market access for agricultural products.

During last decades *Morocco* has gradually opened up its domestic agriculture to international markets, either through unilateral trade liberalization, or through bilateral or multilateral free trade agreements. Conflicts regarding agricultural Euro-Mediterranean trade agreements related to fruits and vegetables are very clear in the case of Morocco. An emblematic case is represented by the bilateral agreement between Morocco and the European Union in the vegetables sector [Cioffi *et al.* 2011]. The EU stance towards Morocco has been affected by the debate on the cost of the trade agreements on particular groups, in particular, fruit and vegetable growers. This debate reappeared during the last agricultural negotiations with Morocco. The extended EU-Moroccan Free Trade Agreement faced strong opposition in the European Parliament, though the final vote was favourable in February 2012. This can be understood as a clear step towards further trade integration. However, trying to offer something to the opponents, in an accompanying resolution, the Parliament called on the Commission to monitor strict application of border measures, such as the tariff quotas applied on tomato imports, and the controls on the entry price system. The resolution also requested an assessment of the impact on European farming [Cioffi *et al.* 2011].

The case of *Tunisia* clearly shows the dilemma faced by SMCs when dealing with trade liberalisation and the peculiarity, as well as the high socio-economic sensitiveness, of the agricultural sector (Box 5).

The EU is the world's biggest market for imports of agricultural products from *Egypt*. More than 80% of these products benefit from duty-free and quota-free access to the EU market. The main agricultural products exported by Egypt to the EU are fresh table grapes, potatoes, sweet oranges, beans, onions and strawberries. To join the sustainable development and rural development with agro-food exports development, some agricultural subsectors should be identified to be the core of such program. Tomato, orange and dairy industries are promising. However, regional marketing companies with vertical integrated stages should be established. It is preferable to have joint venture with EU's investors to overcome the non-tariff barriers of standards and quality that block expansion of these products to EU. Moreover, integration rather than competition between SEMCs (Morocco, Tunisia, Egypt and Turkey) in exporting oranges and vegetables to EU would strengthen their terms of trade, either quantity-wise or price-wise [Soliman 2002].

In the South of the Mediterranean the scope of further intra-regional liberalization exists, following a gradual approach. SEMCs and Turkey could base their trade relationship on comprehensive agreements covering a full range of regulatory areas of mutual interest, following the approach of Association Agreements. As far as agriculture is concerned, the Deauville Partnership launched in 2011 an agenda that covers different priorities: improving market access for agricultural products, encouraging investment, upgrading standards, promoting agricultural research and extension, and delivering efficient and sustainable irrigation services. Partnerships should also help establishing strong links among farmers and value chains.

None of the association agreements between the EU and SMCs refer to restrictions on agricultural subsidies in the EU, beyond what is required by the multilateral framework of the WTO. For the SEMCs, giving direct aid to producers is beyond their reach. The 45 billion Euros in decoupled direct payments in the EU are considered as "green box", not limited by the WTO. Nevertheless, this CAP payment system represents a clear example of the asymmetry of agricultural policies in the North and South of the Mediterranean basin. Consolidating the Euro-Mediterranean common market requires eliminating ad-hoc import measures that make trade less predictable.

Box 5. Agro-food trade liberalisation in Tunisia.

Tunisia has over the years committed itself to a series of international agreements aiming at the gradual liberalization of agricultural products trade. This commitment to the process of integration into the global economy has two main components. On one hand, there is the willingness to further strengthen the Euro-Mediterranean trade partnership given the major place that the European market occupies in the overall external trade of Tunisia. On the other hand, there is the general context of the world market globalization, in line with the WTO guidelines, for the sake of reducing economic inefficiencies thus promoting growth.

Significant reforms have already been performed particularly in the agricultural sector, consisting of partially removing border protection, to reducing subsidies on inputs to more generally relying on market forces in determining the value of goods. These reforms remain, however, incomplete and government intervention in a number of markets and farm structures remains important.

Agricultural trade in Tunisia is marked by a high degree of rigidity due mainly to the existence of several public companies involved at all levels of the import and the marketing of agricultural produce (*e.g.* the Office of Cereals, the Office of Oil). However, since 1994, exports of olive oil are open to private traders. Besides, there is a preferential trade agreement with the EU to export up to 56000 metric tons of Tunisian olive as of the month of March free of duties.

The state also sets the margins of retail sales, negotiates with wholesalers to keep their prices low, makes imports when prices are raising (vegetables), pays bonuses for quality cereals and sets ceiling prices for processed foods. This suggests that the intervention of the public administration is still heavy in Tunisia, in spite of the public rhetoric about government disengagement.

The gradual general opening up of Tunisia to the world market has resulted in the implementation of the structural adjustment program and the signing of regional and bilateral trade agreements, including with the European Union, relating to reductions in border barriers. In the agricultural sector, this trend has been slowed down in view of some fears about full liberalization of agricultural trade and their social consequences. The degree of agricultural protection remains high and is characterized by a system of tariff quotas, adoption of a mix of quotas and tariffs, where tariffs increase when imports exceed a prespecified amount, and high tariffs in other cases.

The need to strengthen agricultural cooperation between the EU and SMCs is urgent. However, trade liberalization alone is not sufficient to alleviate the urgent need for new jobs for the rural youth in SEMCs, which lacks infrastructure, education and sanitation. Therefore, it is necessary to support more effective partnerships. Trade liberalization with SEMCs must be accompanied by increased development aid.

3.4. Conclusions

Mediterranean developing countries are threatened by climate change and population growth could make a bad situation worse. However, SEMCs can be a breadbasket with investment in infrastructure, increased irrigation, input use, improved technology and removal of trade barriers between countries. Recent international socio-economic and structural changes show a trend towards greater convergence and complementarities between the EU and SMCs in the definition of agricultural policies, despite socio-economic and structural differences. The CAP's initiatives should be seized by SEMCs for promoting structural changes in agriculture (land policy reform, productivity improvement, technological and social innovation promotion, sustainable soil and water resources management) for achieving food security.

Nevertheless, the EU, by fostering agricultural competitiveness and exports through the CAP, increases food dependency of food insecure countries including many eastern and southern Mediterranean ones. These countries suffer from food trade deficits and growing expenses for purchases of food especially cereals. They urgently need a policy shift that fosters domestic agricultural production and limits import dependency. Therefore, the EU should make every effort to support such a shift. Unfortunately, the CAP seems heading in the opposite direction thus deepening import dependency and aggravating the problem of food insecurity in the South to secure export markets for the European agrofood industry.

The CAP should respond to food security challenge through the promotion of an equitable food trade regime by removing all market-distorting agricultural tariffs and subsidies and, additionally, supporting sustainable agricultural intensification in developing countries.

There is also a need to evaluate the external multifaceted impact dimension of CAP on global food market and food and nutrition security in developing countries in general and SEMCs in particular. Monitoring the consequences of agricultural liberalisation agreements between the EU and SEMCs and designing and implementing appropriate contingency strategies will be essential. Family farmers destabilisation, food dependency aggravation, rural areas crisis and heightened pressure on natural resources are often mentioned as the potential risks of the Euro-Mediterranean agricultural trade liberalisation. As a matter of fact, and as shown by the present paper, available data on the Euro-Mediterranean agricultural liberalisation and the CAP impacts on food security in non-EU countries are quite fragmented, partial and incomprehensive.

SMCs are experiencing profound changes that will have a strong impact on rural economies. It is difficult to dissociate the ongoing reform of the EU's

CAP from socio-economic development, especially of rural areas, throughout the Mediterranean region. Managing food insecurity in the Mediterranean region will become a geostrategic issue for the EU in the years to come.

However, the assumption that Euro-Mediterranean free trade alone would lead to a strategy which would boost the socio-economic development expected in the SEMCs is increasingly challenged. Issues on food security in the Mediterranean call for integrated Euro-Mediterranean cooperation to foster dynamics to meet food, rural, territorial, social and environmental challenges. Promoting a long-term regional food security vision is vital. The EU can no longer ignore certain critical agricultural and rural realities in SMCs thus underestimating the geopolitical threats that could stem from food insecurity. Quantitative and qualitative food security in SEMCs must be sustained as the principal thrust of Euro-Mediterranean cooperation initiatives promoted by regional organisations such as the Union for the Mediterranean, CIHEAM, etc. in collaboration with the European Commission and EU's Member States.

References

1. Abis S., (2012), *Wheat in the Mediterranean Region: Societies, Trade and Strategies*. European Institute of the Mediterranean (IEMED), Barcelona.
2. African Development Bank, (2012), *The political economy of food security in North Africa.* African Development Bank Economic Brief. http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications.
3. Ahmad B., Alessandrini S., Altomonte C., Bouchard M., Cherfane C. Ch., Colley R., Flichman G., Franz J., George C., Hebblethwaite L., Jaidi L., Kirkpatrick C., Nafti R., Richardson L., Velde D. W., (2007), *Sustainability Impact Assessment of the Euro-Mediterranean Free Trade Area. Final Report of the SIA-EMFTA Project:* The European Union's Sustainability Impact Assessment (SIA) Study of the Euro-Mediterranean Free Trade Area (EMFTA). http://trade.ec.europa.eu/doclib/docs/2008/february /tradoc_137777.pdf.
4. Akesbi A., (2012), *Une nouvelle stratégie pour l'agriculture marocaine.* Le "Plan Maroc Vert". New Medit, Vol. 11, Nº. 2, June 2012, pp. 12-23.
5. http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets /publications- opinion-files/7889.pdf.
6. Breisinger C., van Rheenen T., Ringler C., Nin Pratt A., Minot N., Aragon C., Yu B., Ecker O. and Zhu T., (2010), *Food security and economic development in the Middle East and North Africa: current state and future perspectives.* IFPRI, Washington D.C.

7. Breisinger C., Ecker O., Al-Riffai P., and Yu B., (2012), *Beyond the Arab Awakening: Policies and Investments for Poverty Reduction and Food Security.* International Food Policy Research Institute (IFPRI) Food Policy Report, Washington DC.
8. Bussolo M., De Hoyos R., Medvedev D, (2009), *Global income distribution and poverty in absence of agricultural distortions*. in: Anderson K. (ed.), Distortions to Agricultural Incentives: A Global Perspective. London: Palgrave Macmillan and Washington DC: World Bank.
9. Cantore N., (2012), *Impact of the Common Agricultural Policy on food price volatility for developing countries*. Overseas Development Institute (ODI), London, UK. http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7891.pdf.
10. Chevassus-Lozza E., Gallezot J., Harel M., Persillet V., (2005), *The protection of the European Market in the Fruit and Vegetable sector. The agreements between EU and Mediterranean Countries. Impacts of agricultural trade liberalization between the EU and Mediterranean countries (EU-MED AgPol) project.* http://eumed-agpol.iamm.fr/html/publications/prj_report/d13_rapport1_english.pdf.
11. CFS, (2012), *Coming to Terms with Terminology: Food Security, Nutrition Security,* Food Security and Nutrition, Food and Nutrition Security. Committee on World Food Security (CFS), Thirty-ninth Session, 15-20 October 2012, Rome.
12. Channing A. and Tyner W.E., (2003), *Policy and progress in Moroccan agriculture: a retrospective and perspective.* Food and Agriculture in the Middle East. Research in Middle East Economics, Vol. 5, 2003, pp. 231-56.
13. CIDOB (2012), Middle East: the food security issue. Barcelona Centre for International Affairs (CIDOB). Available at: http://www.cidob.org/en/publications/queestions_cidob/n1_15/middle_east_the_food_security_issue.
14. Cioffi A., Santeramo F.G., Vitale C.D., (2011), *The price stabilization effects of the EU entry price scheme for fruits and vegetables.* Agricultural Economics, 42: 405-418.
15. Clay E., (2002), *Food Security: Concepts and Measurement.* Paper for FAO Expert Consultation on Trade and Food Security: Conceptualising the Linkages, 11-12 July 2002, Rome. Published as Chapter 2 of Trade Reforms and Food Security: conceptualising the linkages. Rome: FAO.
16. De Castro P. and Di Mambro (2013), *The European CAP Reform and the Mediterranean area.* CIHEAM-Watch Letter n° 27, December 2013. http://www.ciheam.org/images/CIHEAM/PDFs/Publications/LV/WL27.pdf

17. De Castro P., Adinolfi F., Capitanio F., Di Pasquale J. (2012). *The future of European agricultural policy. Some reflections in the light of the proposals put forward by the EU Commission.* New Medit, Vol. 11, Issue 2, pp. 4-11.
18. De Hoyos R. and Medvedev D. (2009), *Poverty effects of higher food prices: a global perspective.* World Bank policy research working paper 4887. Washington D.C.
19. Dyson T., (1996), *Population and Food: Global Trends and Future Prospects.* Routledge, London.
20. European Commission - Directorate-General for Agriculture and Rural Development (2002-2011). *Market sectors. Agricultural trade statistics*. http://ec.europa.eu/agriculture/index_en.htm.
21. FAO (1996), Rome Declaration on World Food Security and World Food Summit Plan of Action. *World Food Summit* 13-17 November 1996. Rome.
22. FAO (2001), *Food Balance Sheets*: a handbook. Rome.
23. FAO (2002), The State of Food Insecurity in the World 2001. Rome.
24. FAO (2006), *Policy brief on Food security*. June 2006, Issue 2. ftp://ftp.fao.org/es/ESA/policybriefs/pb_02.pdf.
25. FAO (2011), *The State of Food and Agriculture 2010-2011*. Rome.
26. FAO (2013), *Food security indicators*. http://www.fao.org/economic /ess/ess-fs/fs-data/en.
27. Foresight, (2011), *The Future of Food and Farming.* Final Project Report. The Government Office for Science, London
28. Foresight (2011a), *The Future of Food and Farming: challenges and choices for global sustainability*. Executive Summary. The Government Office for Science, London.
29. Fritz Th (2012), *Globalising hunger: food security and the EU's Common Agricultural Policy (CAP)*. EU funded project Just Trade. http://www.tni.org/files/download/CAPpaper-draft_0.pdf.
30. García Álvarez-Coque J.M., (2012), *Agriculture in North Africa: a chance for development.* Policy Brief, The German Marshall Foundation Mediterranean Policy Programme – Series on the Region and the Economic Crisis, October 2012. http://www.gmfus.org/wp-content/blogs. dir/1/files_mf /1349356066Garc%C3%ADaAlvarezCoque_NorthAfrican Ag_Oct12.pdf.
31. Gasiorek M., Gonzalez J. L., Holmes P., Parra M.M. Rollo J., Wang Z., Maliszewska M., Paczynski W., Cirera X., Willenbockel D., Robinson S., Dawar K., Foliano F. and Olarreaga M., (2010), *Mid-term Evaluation of*

the EU's Generalised System of Preferences. Final Report; CARIS, University of Sussex.
32. GLOBAL 2000, SERI, Friends of the Earth Europe (2013), *Hidden impacts: how Europe's resource overconsumption promotes global land conflicts*. Umweltschutzorganisation GLOBAL 2000, Sustainable Europe Research Institute (SERI), Friends of the Earth Europe. Vienna.
33. Hassan-Wassef H., (2012), *Food security in the Mediterranean*: Public health concern. http://www.ipemed.coop/en/our-projects-r16/agriculture-and-rural-development-c86/-sc68/food-security-in-the-mediterranean-public-health-concern-a1485.html.
34. Hertel T. and Winters A, (2006), *Poverty impacts of a WTO agreement: synthesis and overview*. In Hertel T., Winters A. (ed.), Poverty and the WTO. Impacts of the Doha Development Agenda. The World Bank and Palgrave Macmillan, Washington DC.
35. IFPRI and Welthungerhilfe, (2006), *The Challenge of Hunger – Global Hunger Index: facts, determinants, and trends.* October 2006, Bonn.
36. Ingram J.S.I., (2011), From food production to food security: developing interdisciplinary, regional-level research. PhD Thesis, Wageningen University.
37. Kearney J., (2010), *Food consumption trends and drivers.* Phil. Trans. R. Soc. B, 27, 2010, vol. 365/1554, pp. 2793-2807.
38. Lang T., (1999), *Diet, health and globalisation: 5 key questions.* Proc. Nut. Soc.; 58: 335-343.
39. Malorgio G. and Solaroli L., (2012), *Policies and regulations in the Mediterranean: complementarity and coherence. In Mediterra 2012: The Mediterranean Diet for Sustainable Regional Development.* International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM). Presses de Sciences Po, Paris. pp: 443 - 464.
40. Ministère de l'Agriculture et de la Pêche Maritime du Royaume du Maroc (2011), *Situation de l'agriculture marocaine*. Nº9, Novembre 2011. Rabat.
41. Padilla M., Ahmed Z.S., Wassef H.H., (2005), *In the Mediterranean region: overall food security in quantitative terms but qualitative insecurity.* CIHEAM analytic note N ° 4 – June 2005. http://portail2.reseau-concept.net/Upload/ciheam/fichiers/ANP4.pdf.
42. Petit M., (2009), *Agro-Food Trade And Policy Issues In The Mediterranean Region Implications For The Future Of The Cap… and ather European Policies.* EU budget review Workshop on *"Reflections on the Com-*

mon Agricultural Policy from a long-run perspective", organized by the European Commission (BEPA), Brussels, February 26, 2009.
43. Rastoin J.L. and Cheriet F., (2010), *Food security in the Mediterranean: a major geostrategic issue.* http://www.ipemed.coop/adminIpemed/media/fich_article/1316526334_LesnotesIPEMED_6B_FoodSecurity_ENG.pdf.
44. Santeramo F.G. and Cioffi A., (2012), *The entry price threshold in EU agriculture: deterrent or barrier?* Journal of Policy Modeling, 34(5): 691-704.
45. Scarpato D. and Simeone M., (2013), *Euro-Mediterranean integration and competitiveness of the agro-food sector.* An empirical analysis in Campania region. NewMedit, Vo XII, N° 3/2013. pp. 55-63.
46. Soliman I., (2002), *Food Security in Arab countries under Global and Regional Changes.* Egyptian Journal of Development Planning, vol. 10, No. 2, pp. 124-152.
47. Soliman I. & Bassiony H.E.M., (2012), Egyptian agricultural exports competitiveness. *L'Egypte Contemporaine: Revue trimestrielle de la société égyptienne d'économie politique, de statistique et de législation*. No. 505, Janvier 2012, pp. 4-28. http://sustainmed.iamm.fr/images/downloads/egyptian_competitiveness.pdf.
48. Stephens C., Lewin S., Leonardi G., Chasco M.S.S., Shaw R., (2000), *Health, sustainability and equity: global trade in the brave new world.* Global Change and Human Health; 1: 44-58.
49. Tangermann S., (2011), *Policy Solutions to Agricultural Market Volatility*: A Synthesis. June 2011. International Centre for Trade and Sustainable Development (ICTSD) Programme on Agricultural Trade and Sustainable Development. http://ictsd.org/downloads/2011/12/policy-solutions-to-agricultural-market-volatilty.pdf.
50. The Economist, (2012), *Global food security index 2012: An assessment of food affordability, availability and quality*. Economic Intelligence Unit. http://pages.eiu.com/rs/eiu2/images/EIU_DUPONT_Food_Index_July_2012.pdf.
51. UN-HLTF, (2011), *Food and Nutrition Security: Comprehensive Framework for Action.* Summary of the Updated Comprehensive Framework for Action (UCFA). United Nations System High Level Task Force on Global Food Security (HLTF); Rome/ Genève/ New York.
52. Waltner-Toews, D. and Lang, T., (2000), *New Conceptual Base for Food and Agricultural Policy: The Emerging Model of Links between Agriculture, Food, Health, Environment and Society.* Global Change and Human Health, Volume 1, Issue 2 , pp 116-130.

53. WHO (2012), *Food security*. http://www.who.int/trade/glossary/story028/en.
54. WHO and FAO, (2003), *Diet, Nutrition and the Prevention of Chronic Diseases*. WHO Technical Report Series 916. Report of a Joint WHO/FAO Expert Consultation. World Health Organization (WHO) & Food and Agriculture Organization of the United Nations (FAO), Geneva.
55. Winters, L.A. (2005), *The European Agricultural Trade Policies and Poverty.* European Review of Agricultural Economics, Vol. 32 (3), pp. 319-346.
56. World Bank, (2012), *Food Prices, Nutrition, and the Millennium Development Goals.* Global Monitoring Report 2012. http://go.worldbank.org /B8CQ09GOZ0.
57. Zahrnt V., (2011), *Food Security and the EU's Common Agricultural Policy: Facts Against Fears.* European Centre for International Political Economy (ECIPE) Working Paper No. 01/2011. http://www.groupedebruges.eu/pdf/Zahrnt_FoodSecturity&CAP.pdf.

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