
SMALL FARMS IN THE PARADIGM OF SUSTAINABLE DEVELOPMENT

**Case studies of selected Central
and Eastern European countries**

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Preface

In recent years, in the field of agricultural economics, a discussion about the directions in development of the agricultural sector has taken place. The industrial agriculture model, popular in the second half of the last century, is increasingly being contrasted with the concept of sustainable development. This is the effect of the growing awareness of the negative externalities that the neoliberal model of market regulation has brought. Guided by the principle of microeconomic optimisation, it favoured concentration of production, creating large-scale agricultural enterprises and transnational concerns. This process took place in the conditions of deprivation of weaker agricultural producers, extinction of production in areas with less favourable natural and economic conditions, degradation of the natural environment and deterioration of food quality. Paradoxically, the problems mentioned above concern highly developed countries, while in other regions of the world the agricultural sector operates in a more traditional way. The basis of its functioning are small-scale family farms. This situation is also typical for Central and Eastern European countries, hence the question about the desired scenario for the agricultural sector in this part of the globe. According to the editors, sustainable development is necessary to maintain the functioning of small farms in the context of the increasingly destructive side effects (both socially and environmentally) of industrial agriculture. At the same time, the authors are aware of the shortcomings of small agricultural holdings, associated primarily with low productivity of production factors. However, they assume that the various non-economic functions that this type of unit fulfill overcompensate for these negative aspects of small farming.

The presented monograph addresses these dilemmas and tries to demonstrate the legitimacy of such thinking. It covers a broad case study of Central and Eastern European countries, such as: Poland, Romania, Lithuania, the Czech

Republic, the Republic of Serbia and the Republic of Moldova. The authors of the following chapters attempt to expound the perception of agriculture in a given economy, and – against this background – show the position of small family farms and their role in support policy. The complementary part includes a review of the EU’s agricultural policy as an exemplification of the Community approach to the issue of small-scale farms. As a result, the joint goal of all parts of the book is to unravel universal premises for the functioning of fragmented agriculture in the analysed part of Europe. The conclusions of the study may corroborate the hypothesis about the need to incorporate small-scale farms into market processes, while preserving the function of a provider of social and environmental public goods, in line with the changing expectations of society.

This monograph was created as part of the research project of the Polish National Agency for Academic Exchange, the International Academic Partnerships program (contract number PPI/APM/2018/1/00011/U/001). The project entitled ‘The role of small farms in the sustainable development of the food sector in the countries of Central and Eastern Europe’ has been implemented since the beginning of 2019 by Universities and Institutions from five countries (listed above) outside the Czech Republic. One of the first tasks was to prepare detailed reports with a diagnosis of the agricultural sector in these regions, with particular emphasis on small farms in the context of sustainable development. Based on them, chapters of this book have been compiled and their contents are the basis for the Project research. The added value of this monograph stems from data of national statistical databases, reports and studies conducted in languages native to the countries under the study. Gathering them all in one place, without the involvement of co-authors from all analysed countries, would be an impossible endeavor. It has to be pointed out that there are no other comparative analyses, as comprehensive as this one, of the agricultural sector in the regions of Central and Eastern Europe.

At this point, we would like to thank everyone involved in the creation of this monograph. In particular, we would like to thank our Project Partners from ‘1 Decembrie 1918’ University in Alba Iulia, Vytautas Magnus University in Kaunas, Megatrend University in Belgrade, The National Institute for Economic Research in Chisnau and Stanislaw Staszic State University of Applied Sciences in Piła. Many thanks to people from our friend Mendel University and Poznań University of Economics and Business. The work would not have been accom-

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CHAPTER 1. Small farms in the world: Selected issues

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Abstract

The importance of small farms for sustainable development, ensuring global food security and mitigating climate change has become a frequent topic of scientific debates and international discussions. This chapter investigates the definition of the small farm and key issues related to small-scale farming, particularly the distribution of small farms within specific regions, how they are perceived, their relationship to sustainable development and their role in ensuring food security and mitigating climate change. The chapter ends with reflections on policy towards small farms.

Keywords: small farms, agriculture, sustainable development, food security

JEL codes: Q01, Q54

1.1. Introduction

Small farms and related rural areas are places of residence and work for nearly 50% of the world's population [World Bank 2016] and especially in the poorer parts of the world. At the same time, small farms contribute significantly to ensuring food security, especially in developing countries. They also protect and enhance natural resources and the environment. Discussions about small farms are, however, very difficult because opinions about them vary widely in different parts of the world. There is no consensus even on the definition of a small

farm. Therefore, the purpose of this chapter is to organise information about small farms based on a literature review.

The rest of this chapter is organised as follows: the next two sections provide a review of the definition of the small farm and basic data on their number and the area they occupy. The following section discusses contemporary perceptions and specific economic, social and environmental aspects of the role of small farms in sustainable development. The next two sections contribute to an understanding of the role of small farms in climate change and food security. The final two sections provide some policy insights and conclusions.

1.2. What is a small farm?

The analysis of small farms is difficult because there is no clear answer to this question.¹ Researchers emphasise that there is no universally accepted definition of small farms (or smallholder) [Davidova and Thomson 2014; Guiomar et al. 2018]. This is primarily because the structure of farms is multi-dimensional in various countries and regions and because farms are categorised differently based on physical and economic size, market participation, revenue or commodities sales, the number of part- and full-time workers they employ, the types of farming and so forth. Small farms can also vary greatly because of the heterogeneity of farming systems, historical legacies and the demographics and geographical circumstances of countries [Gioia 2017]. In the literature, the term ‘small farm’ is often used synonymously with terms such as ‘subsistence farm’, ‘semi-subsistence farm’, ‘resource-poor farm’, ‘low-sales farm’, ‘non-commercial farm’, ‘low-input farm’ or ‘family farm’. However, these terms may differ in their meanings, especially for the last one, and should not be used interchangeably in each case [Heidhues and Brüntrup 2003]. The use of family labour resources and farm management by a family member is assumed to be the

¹ It can be also notice, that there is also no universal definition of a farm. Therefore, the definitions may differ depending on the definition criterion adopted. In practice, each country adopts separate conditions for defining this concept. For example, in Poland we distinguish the following criteria: the Civil Code, tax law, support under the CAP, for the purposes of determining contributions and pensions, for calculating health insurance and for statistical purposes of the Central Statistical Office.

main distinguishing feature of a family farm. Social relations in the family and in the local community, cultural context and traditions as well as involvement in the life of local communities as a function of supporting rural areas are also treated as very important characteristics [Drygas 2014]. Due to the fact that these functions are frequently assigned to small-scale agriculture, the notion of ‘small farm’ and ‘family farm’ is equated. Anyway, this approach seems justified in the case of regions or countries where the basis of agrarian structure are small family farms. This situation occurs, among others in Africa, Asia, and most countries of Central and Eastern Europe. Therefore, if the term ‘family farm’ appears later, the authors mean a small-scale farm. A similar approach is used, *inter alia*, by Dixon, Tanyeri-Abur and Wattenbach [2004], Thalpa [2009] and Berdegué and Fuentealba [2011].

Small farms are defined according to different criteria, such as structural size (e.g. farmland area, number of animals, number of labour force), economic size (standard output, gross cash farm income or farm revenue, annual sales or turnover, etc.) and market participation (e.g. purchased inputs, foodstuff sales) [ENRD 2010; European Commission 2011; Szumelda 2013; Guiomar et al. 2018]. Small farms are usually distinguished by using thresholds on these farm size indicators [Davidova and Thomson 2014], but each category has its advantages and disadvantages.

The most common indicator for differentiating small farms is the physical threshold expressed in farmland areas such as hectares (ha) or utilised agricultural area (UAA). In this context, small farms are often defined as those with an agricultural area less than 2 ha or 5 ha [Wiggins, Kirsten and Lambi 2010; IFAD and UNEP 2013; Lowder, Skoet and Raney 2016]. Such a criterion has universal appeal because it is easily measurable and available for all farms as univocal information, but also because the land resources are relatively unchanging over time, hence the unit assignment to a given group is permanent. It is also convenient to use for cross-country and world regions analyses. However, it is strongly influenced by the geographical context of analyses [Guiomar et al. 2018]. The disadvantage of this approach is that the sole number of hectares does not capture all the complexity of a farm system.² So,

² For example, the average farm size in the US is 175 ha, in Australia 3,200 ha, but in India and China around 1.25 ha.

the criterion of average size should be accompanied by additional criteria like the number of people employed, the number and types of commodities produced, the degree of specialisation, farm income or sales and land efficiency.³

Another structural threshold indicator is the size of the labour force. Small farms generally use a lower labour input than larger farms. Because people often work part-time on the farm, the labour input is measured by the number of annual work units (AWU) per farm instead of the number of persons. AWU is understood as the equivalent in full-time work of each person working on the farm. According to that criterion, farms are small when they employ less than 1.5 AWU [European Commission 2011; Guiomar et al. 2018]. This way of identifying small scale farming is relatively easy to collect and to understand, but only a few countries provide such data at a regional scale [Guiomar et al. 2018]. It also does not take into account some particular characteristics (e.g. specialisation, extensive or intensive production) and technological modernisation [Veveris and Sapolaite 2017] that determine the farms' employment.

These physical definitions of small farms are not always sufficient to reflect their economic potential, so an economic size indicator is used. This criterion is especially applied in the European Union, where the economic size of a farm is measured by the total Standard Output (SO) expressed in euro. A threshold of EUR 25,000 of SO⁴ per year is used to define a small farm (from EUR 8,000 to less than EUR 25,000). Very small farms (from EUR 2,000 to less than EUR 8,000) and medium small farms also are distinguished (from EUR 25,000 to less than EUR 50,000) [FADN 2018]. The economic criterion of small farms compliments the physical one and is often adequate to identify farms' need for special support. As some examples show, being small in physical terms does not mean that the farm is small in economic terms [ENRD 2010; European Commission 2011].

³ For example, farms that specialised in horticulture generally had a smaller than average UAA and could yield higher revenue than farms of extensive production on a large area [European Commission 2011].

⁴ This measure has been used since 2010. Before that, small farms were defined as having less than 8 ESU (European Size Units, 1 ESU = 1,200 EUR). ESU was calculated as the sum of the standard gross margin (SGM) of each agricultural activity [European Commission 2011; Guiomar et al.].

Market participation is sometimes used to define small farms. This refers to the share of a household's self-consumption and it uses the categories of subsistence, semi-subsistence and commercial farm. The drawback to using market participation is the lack of data. So, a more popular approach is to divide farms into only two groups: one where the household consumes less than 50% of its production and one that consumes more (called self-consumed) [European Commission 2011]. The main disadvantage to this is that the share of agricultural products sold or consumed by a household can be assessed only by farmers, it is discretionary [Davidova 2011] and it needs detailed information, which is not practical to gather in a very large population [ENRD 2010]. It is worth noting that market participation should be assessed not only from the consumption point of view but also from the production perspective [Davidova, Fredriksson and Bailey 2009; EC 2011].

Thus, it can be concluded that it is difficult to explain 'how small is small?'. As noted by Nagayets [2005] 'the sole consensus on small farms may be the lack of a sole definition'. Assessing the power of small farms, more than one criterion should be analysed against the geographical background. The distribution of farm sizes is very heterogeneous across countries, regions and the world [Hazell et al. 2010; Lowder, Scoet and Raney 2016] so it is difficult to present the global situation of small farms as a universal case.

1.3. Small farms in numbers

It is estimated that there are around 570 million agricultural holdings in the world, of which around 4% are in high-developed countries, 50% are in China and India and the remaining 46% are in other developing countries [FAO 2014; Lowder, Scoet and Raney 2016]. The vast majority of farms in the world are small farms (less than 2 ha) and are estimated to be around 475–500 million [Wiggins, Kirsten and Lambi 2010; IFAD and UNEP 2013; Lowder, Scoet and Raney 2016]. Farms smaller than 1 hectare account for 72% of all farms but control only 8% of all agricultural land. Farms between 1 and 2 ha account for 12% of all farms and control 4% of the land, and farms between 2 and 5 ha account for 10% of all farms and control 7% of the land. Farms larger than 50 ha account

for only 1% of the world's farms, but they control 65% of the world's agricultural land [FAO 2014].

These numbers, however, look different in specific income groups and in specific regions. In developing countries, where over 95% of all farms are smaller than 5 ha, these farms occupy around 70% of all farmland. Farms bigger than 5 ha occupy only 30% of all farmland in developing countries, but over 95% in developed countries. In developing countries, the size of the average farm is decreasing while in developed countries it is increasing [Lowder, Scoet and Raney 2016].

In East Asia and the Pacific, South Asia and Sub-Saharan Africa, over 50% of farms are smaller than 1 ha, and over 90% are smaller than 5 ha. These farms occupy a relatively high share of the agricultural area – over 60%. In those regions, only a few farms are larger than 50 ha. In Europe and Central Asia and the Middle East and North Africa, the pattern is different. Small farms (less than 5 ha) also make up the majority of holdings (over 80%), but their share of occupied agricultural land is less than 30%.

**Table 1. Small farms in developing countries
by total holdings and farmland area**

Region	Share of holdings by land size (in percent)		Share of agricultural area by land size (in percent)	
	< 1 ha	< 5 ha	<1 ha	< 5ha
East Asia and Pacific (excl. China)	> 50	> 90	< 15	< 60
South Asia	> 60	> 95	< 20	< 70
Europe and Central Asia	> 45	> 80	< 5	< 30
Middle East and North Africa	> 60	> 85	< 10	< 25
Sub-Saharan Africa	> 60	> 90	< 20	< 75
Latin America and the Caribbean	> 15	> 50	< 1	< 5

Note: Country groupings are the same as those used by the World Bank.

Source: Lowder, Scoet and Raney 2016.

In Latin America and the Caribbean, small farms operate on a very small share of land because in that region almost 50% of agricultural land is occupied by farms larger than 1,000 ha. In high-income countries, 98% of all farms are larger than 5 ha and the average size of an agricultural holding exceeds 60 ha [FAO 2017; Lowder, Skoet and Raney 2016]. However, in high-income countries, especially in Europe, the share of small farms (less than 5 ha) in the total number of holdings is very diverse, from less than 10% in Germany or Great Britain to over 70% in Italy.

1.4. Contemporary perceptions of small farms in the context of sustainable development

The importance of small farms has been questioned many times in literature. When one thinks about small farms, traditional technology, inefficient use of scarce resources [Kostov and Lingard 2004] and poverty [Mathijs and Noev 2004] come to mind. Small farms are treated as an unwanted phenomenon and as impediments to rural growth [Davidova, Fredriksson and Bailey 2009]. Small farms are seen to have low efficiency and productivity, with weak integration into markets. The result is insufficient household income [ENRD 2010].

Small farms are perceived as an intermediate stage of agricultural transformation that is directed toward specialisation and market orientation [Petrick and Tyran 2003]. This process is in line with overall economic growth characterised by a decline of the relative importance of agriculture's contribution to GDP. Shrinking number of small farms caused by an inability to compete with efficient agribusiness was treated as a natural process in the neoliberal debate. But it seems that perception has changed in recent years and in the 21st century the position of small farms is growing [Shucksmith and Rønningen 2011].

Opinions about the need for small farms are changing because of changing economic, social and environmental circumstances. They are no longer being ignored – both large and small farms may function successfully since the objectives and trends of their activity and success factors are different [Lithuanian Institute of Agrarian Economics 2018]. The role of small farms is discussed in various aspects, including sustainable development and its economic, social and environmental dimensions. Some researchers emphasise the role of smallhold-

ers in economic growth and reducing poverty. They suggest that growth among smallholders has far more growth ‘linkages’ (by production and demand) than growth in any other sector. Some argue that growth in agriculture has the highest multiplier effects [Mellor 1995], and they offer Africa as a prime example [World Bank 2007; Staatz and Dembele 2008; Janvry and Sadoulet 2010].⁵

Small farms seem to be important also for the social dimension of sustainable development. Small farms are of very large significance in developing the density of rural population, including the borderland and less beneficial territories. Hence, to some extent, they are responsible for rural viability. From a social point of view, small farms can be treated as a buffer against poverty and economic crises. According to Heidhues and Brüntrup [2002], small farms allow people to survive under difficult and risky conditions, and they can stabilise, to some extent, fragile economies. There is also an important role of small farms in their contribution to the creation and protection of cultural and natural heritages.

Small farms can play an important role in providing some environmental public goods such as landscape and biodiversity, the quality air, soil and water and improving the resilience of the land to natural disasters such as fires and floods. Small farms practice high-diversity agriculture more often than large commercial farms. There are several reasons for this inverse relationship [Boyce 2004]. First, small farms are generally more labour intensive. Cultivating some varieties needs more time and effort, so they are applied by farmers with a lower real cost of labour, usually family labour. Second, high-diversity agriculture depends on the farmers’ knowledge of different crop varieties and their relationships to microhabitat variations. Small farms are perceived as repositories of such knowledge, with special attention to indigenous cultures. Traditional ecological knowledge is a combination of theory, experience and beliefs [Berkes 1999]. The significance of local farmers’ knowledge used for diversified arable crops was the subject of research [Berkes, Colding and Folke 2000]. Third, small farms often exist in unfavourable agricultural environments, on land that is unattractive for large commercial farms. For example, according

⁵ However, according to Collier and Dercon [2014], there is no evidence for such a significant role of small farms in growth, so they suggest moving the ‘emphasis and resources away from small farm (and small trader) models and open up new forms of commercialisation’.

to Tryjanowski et al. [2011], bio-culturally diverse agriculture is mainly present in socially and economically peripheral areas in Europe. The marginalisation of the land is connected with low productivity of soils, distance from large cities and industrial centres, migration because of a lack of industrial development and limits to the prosperity of mass tourism [Danson and de Souza 2012]. Historical and political circumstances [Babai et al. 2015], traditional landscape structure and local cultural and management also play their roles [Babai and Molnár 2014].

1.5. Small farms and climate change

Agriculture emits into the environment significant amounts of greenhouse gases (especially carbon dioxide, methane and nitrous oxide). The share from agriculture on the global scale is between 11% and 24% (including agriculture, forestry and other land use), and it varies in different continents (less than 11% in North America and Europe, 15–17% in Africa and Latin America and the Caribbean, to 44% in Asia [FAO 2014; Ritchie and Roser 2018; The World Bank 2014]. Crops and livestock are the main sources of water pollution by nitrates, phosphates and pesticides, but they contribute to air pollution as well. Another issue is the increase in population. This requires higher production, which is achieved by expanding agricultural land and intensifying farming practices [Ritchie and Roser 2018]. Thus, agriculture is one of the main causes of global warming and the loss of the world's biodiversity. At the same time, agriculture has the potential to mitigate some effects of climate change [FAO 2019].

Agriculture is also affected by climate change in both positive and negative ways. Global warming can bring some benefits for agriculture: new areas suitable for planting, longer growing periods, decreases in the costs of overwintering livestock, improved crop yields and faster growth of forests. However, agriculture may also suffer from climate change, because the weather becomes more volatile and unpredictable. In some regions of the world, there are new and sharp phenomena in agriculture like droughts, floods and tornados [FAO 2019]. Because of all this, the relationship between agriculture and climate change is complex.

The adverse impacts of climate change fall disproportionately on poor countries and regions (tropical and subtropical zones). It will be the hardest and the most unfavourable for small-scale farmers and other low-income groups

in areas prone to drought, floods, saltwater intrusion and sea surges [Awazi, Tchamba and Avana 2019; FAO 2019; Habtemariam, Kassa and Gandorfer 2017]. Bharucha [2019] suggests that it will affect farms working on land below 2 ha. Other authors stress that climate changes will affect Africa the most because most of its farming systems depend on climatic parameters such as dependence on rainfall distribution and susceptibility to drought in cocoa production. This, in turn, is very important for many African countries (for example Ghana, where there are over 800 thousand smallholder farm families) [Asante et al. 2017]. The impact of climate change on farms depends on many factors, including farm size and physical environment, the types of crops grown and local climatic changes [Habtemariam, Kassa and Gandorfer 2017]. According to Abid et al. [2016], the sensitivity of small farmers in Pakistan to climate-related risks depends on the availability of resources. At the same time, some authors suggest that there should be improved access to the institutional services connected with the climate-specific advisory. It could help farmers to adapt to climate change, increase resilience to climate-related risks and improve their economic situation [Abid et al. 2016].

There are some technological and political tools to reduce greenhouse gas emissions and to promote adaptation to climate change which could be addressed to farms (including small farms). These are better management of residues from crop and livestock, improvement of fertiliser and water use efficiency, restoration of degraded lands and expansion of agroforestry and reforestation, the introduction of subsidies for using environmentally friendly techniques, the introduction of environmental taxes on chemical fertilisers and energy inputs [FAO 2019]. One example of using a positive and encouraging instrument of agricultural policy to support environmentally friendly farming practises is a ‘green’ direct payment beneficial for the climate and the environment. The principle behind this greening method is to remunerate farms for their efforts to protect the environment and keep the biodiversity. And this instrument may be promoted among small farms, which cannot compete equally with large ones and achieve economies of scale [European Commission 2017]. China is one of the most polluting countries in the world. It produced 27% of global emissions of carbon dioxide in 2017 [Ritchie and Roser 2018], especially from industry, but from agriculture as well. Implementing environmental technologies needs strong policy subsidies to be accepted by the farmers [Hu et al. 2019]. Bharucha [2019]

points out that small farms are increasingly using innovative methods to reduce greenhouse emissions and adapt to climate change. He calls them ‘true pioneers of climate-smart agriculture’, being both productive and environmentally friendly, providing benefits like conserving biodiversity and even reducing poverty and improving nutrition. Thus, they can implement sustainable intensification around the world, for example in Burkina Faso, Ethiopia, India, Kenya, Niger, Tanzania and Uganda. Some authors point out the need to implement the climate-smart practices in small farms if they are to continue feeding the increasing population in Asia and Africa [Awazi, Tchamba and Avana 2019].

1.6. Role of small farms to provide sustainable food security

One of the major challenges today is to achieve sustainable food security (i.e. the basic right of people to consume the food they need, without harming the social and environmental system). Farmers play an important role in ensuring food security and improved nutrition, but they are also affected by a lack of food security. These include typically owners of small farms and their families. [Ruane and Knickel 2016]. The problem of food security in small farms is often addressed in the literature [Tibesigwa and Visser 2016; Ahmed et al. 2017; Reincke et al. 2018]. According to FAO data, the problem of hunger affects 800 million people, of whom most are in rural areas. The reasons for food insecurity include low income, poor links to the market and adverse climatic conditions.

Globally, small and medium farms are significant in ensuring sustainable food security. According to different sources, 500 million small farms produce between 30% [Ricciardi et al. 2018] and even 80% of the world’s food [FAO 2014]. These farms, however, use only 25% of natural resources, including land, water and fossil fuels, to produce food [ETC 2017]. However, important regional differences exist. In North and South America, Australia and New Zealand, over three-quarters of cereals, meat and fruits and vegetables are produced by large farms over 50 ha. In Sub-Saharan Africa and Asia, however, small farms produce over three quarters of food products; and very small farms (less than 2 ha), about one third [Herrero et al. 2017].

But ensuring food security refers to both an adequate caloric intake and micro-nutrients such as vitamins and minerals. Smaller farms grow more crops used for

food. A large volume of crops produced by bigger farms go into processed goods like biofuels, are used or sold as seed or animal feed or are lost during storage and transport [Naylor et al. 2005]. On a global scale, most vegetables, roots and tubers, pulses, fruits, fish and livestock products and cereals are produced in diverse landscapes. The same is true for the majority of global micro-nutrients and proteins. Yet the diversity of agricultural and nutrient production diminishes as farm size increases [Herrero et al. 2017].

The importance of small farming in ensuring sustainable food security has been recognised globally and included in the UN Sustainable Development Goals, especially in Goal 2.3. This goal aims to end hunger and achieve food security through sustainable agriculture by 2030 by doubling the agricultural productivity and the incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers [United Nations 2015].

1.7. Agricultural policy towards small farms

Agricultural support (through subsidies) has been criticised for distorting markets, market forces and the allocation of production factors in economies by constraining structural changes which are crucial for economic growth and development. At the same time, there are many reasons to support this sector and its benefits, especially in form of supporting farm incomes, keeping the added value in agriculture, sustaining rural areas and creating jobs in agriculture and other sectors of the economy [Garrone et al. 2019]. This kind of policy seems to be especially important for small farms, which are depreciated in the economy and are not able to achieve economies of scale.

Based on the achievements of the International Year of Family Farming 2014 (formally declared by the General Assembly of the UN), the United Nations declared 2019–2028 to be the Decade of Family Farming [FAO 2019b]. In this way, the Food and Agricultural Organization (FAO) shows that small-scale family farming will play an important role and can hold the key to a more sustainable future. Supporting small and family farms is included in four regional priorities of FAO in Europe and Central Asia, where FAO aims to improve policy development, sustainable agricultural production and rural livelihoods while reducing rural poverty. Other general and crucial challenges and purposes are: (1) diversify the

rural economy to provide both on- and off-farm employment; (2) support farmers in the form of training to shift production processes to more environmentally friendly methods (like organic farming and agroecology); (3) promote the engagement of female farmers; (4) improve agrarian structures and support land consolidation while ensuring access for smallholders. FAO promotes integrated community development, a participatory and inclusive approach adjusted to each community. The tools to achieve the goals mentioned above are better policy coordination, social protection, investments in rural infrastructure, improvement of input used in production and one-off support schemes for new farmers [FAO 2019b]. Such activities are included in India's agricultural policy [Singh, Kumar and Woodhead 2002]. In Kenya, agricultural policy revolves around increasing productivity and income growth in farms, encouraging the diversification of farms, supporting food security and ensuring environmental sustainability. These goals concern especially small farms [Alila and Atieno 2006]. The diversity of small farms implies that they may respond differently to any development support or initiative under an agricultural policy, thus targeting policy interventions seems to play a crucial role [Kansiime, van Asten and Sneyers 2018]. Therefore, there is a need to concentrate support on interventions that contribute significantly to farm efficiency, in particular, in small farms. Although some authors point out that the need for governments to help small farms is not always apparent, but well-targeted agricultural policy to correct market failures can improve efficiency and equity, which could be beneficial for agriculture [Hazell et al. 2010].

In the Common Agricultural Policy (CAP) of the European Union, there are many instruments for supporting farmers. The most common and important one is direct payment, which are granted to farmers in the form of a basic payment per hectare. There are two additional instruments that target small farms. These require farmers to apply for them. They are (1) redistributive payment and (2) small farmers-scheme. Redistributive payments aim to improve support for small and medium-sized farms. EU countries may reallocate up to 30% of their national budget to redistributive payments for the first eligible hectare. As of 2019, 10 EU member states are using this tool. The second instrument is a small farmers scheme that simplifies administrative procedures and exempts participating farmers from greening obligations and cross-compliance sanctions and controls. This is because small farms could have problems complying with

these regulations. At present, the scheme is applied in 15 EU member states [European Commission 2017].

1.8. Conclusions

In developing countries, small farms occupy most of the farmland and produce most of the food. Small farms are therefore crucial to global food security and sustainable development, although they achieve lower income and are not as productive as large farms. However, they can play different roles, which are ignored by large farms. These could include maintaining the vitality of rural life and stimulating the local economy, providing public goods (air, soil and water of good quality, ensuring biodiversity), producing food ecologically and protecting cultural and natural heritages. Moreover, small farms can contribute to mitigating climate change by using environmentally friendly farming practices [see i.a. Altieri 2008; D'Souza and Ikerd 1996; Bargout 2014]. Therefore, the importance of small farms and the benefits they provide should be appreciated, while the challenges they face should be recognised.

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Chapter 2. Small farms in Poland

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Abstract

Small farms in Poland constitute the core of the agricultural sector. Their share in the structure of farms, employment in rural areas, total agricultural production and utilised agricultural area is relatively high. These entities also perform many social and environmental functions, which underlines their importance. Therefore, the purpose of this chapter is to indicate the position of small farms against the background of the entire agribusiness sector, to define their role as a provider of public services, and finally to show activities in the field of support policy for this group of market participants. These elements will be preceded by considerations on the definition of a small farm. This study is based mainly on data from Central Statistical Office, Farm Accountancy Data Network and Eurostat, as well as source materials and thematic papers.

Key words: small farms, Polish agriculture, support policy, statistical data

JEL codes: Q12, Q18, E6, O13

2.1. Introduction

Agricultural development is one of the key dilemmas of the modern world. As global population grows, there is a rising demand for food, which demonstrates the strategic role of this sector. There is no single answer to the question of which development model should prevail in current economic, social, environmental and climatic conditions. However, the necessity to consider the above mentioned

criteria on an equal footing, in compliance with the assumptions of sustainable development, is increasingly recognised. This subject is particularly important from the point of view of small agricultural holdings, especially when we take into account their number and their role in the development of agriculture and rural areas. It is estimated that there are about 570 million farms in the world and that about 4% of them are located in highly developed countries [FAO 2014; Lowder et al. 2016]. The great majority of farms, especially those situated in developing or poor countries, are still small farms (here: less than 2 ha). Their number is estimated to be about 475–500 million [Wiggins et al. 2010; IFAD and UNEP 2013; Lowder et al. 2016].

In the second half of the 20th century, the functioning of the economy was perceived through the lens of economic efficiency, treated as the main selection criterion in neoliberal political doctrine [Diaz and Korovkin 1990; Moore 2000; Busch 2010]. In the case of agriculture, it was assumed that its development should involve industrialisation, as well as the consolidation of land and farms. The then market mechanism was based on the triad of ownership, as well as supply and demand regulations in agriculture. It was supposed to lead to the concentration of production, which would lower unit costs, and to the pressure to increase work efficiency, as a precondition for competitive advantage [Hayami and Ruttan 1985; Gruchelski and Niemczyk 2016]. At the same time, the doctrine which postulated the primacy of microeconomic efficiency stimulated the development of oligopolistic and monopolistic structures. As a consequence, small farms were pushed out of the market because in the process of generating economic surplus, they were the weaker party as compared to their market environment. In this approach, small farms were treated as backward and unproductive, and thus constituted a threat for the development of the global economy [Heidhues, Brüntrup 2003]. However, the pressure to increase efficiency did not take into account the full cost of the production process. It is not only about social costs related to the elimination of small-scale farming, but also about the increasing environmental burden and the failure to balance unfavourable factors, such as soil impoverishment, the worsening of hydrologic conditions, the eutrophication of bodies of water, steppe-formation, etc. Therefore, environmental welfare and its uniqueness are not taken into account.

As a response to reservations about industrial farming, there emerged the idea of sustainable farming [Lantiga et al. 2015; Velten et. al. 2015; Zegar and

Wrzaszcz 2017]. It postulates multi-dimensional objectives, starting from food production, through satisfying social and cultural needs, ending with care for our environment. Its integral part are small family farms, which set biodiversity against monoculture large-scale production, environmental sustainability against 'modern' pesticides and fertilisers technology and a high quality of food against industrial high processed manufacturing methods. In this sense, the problem of small farms can be examined from the point of view of their role in the development of agriculture and rural areas, as well as economic and environmental factors which affect their market activity [Shucksmith and Rønningen 2011]. From a practical point of view, a precondition for popularizing the sustainable model of agricultural development is social understanding of the limited nature of our ecosystem and coming to a conclusion that what is important for the agricultural sector are not only market goods, but also non-market and non-commercial (public) goods, such as environmental welfare, the harmony of nature and agricultural production, the vitality of rural areas, etc.

This approach becomes more common in the strategy of the European Union and is reflected in particular by the Common Agricultural Policy [Swinnen 2015; Czyżewski and Stępień 2018]. Since its very beginning in the 1960s, it has evolved from a pricing policy and intervention buying into a policy geared towards the broadly defined multi-faceted agricultural development, care for the environment, landscape conservation, preserving traditions and the cultural heritage of rural areas [Wilkin 2013]. Small-scale family holdings in the agricultural sector have become the priority of CAP [OECD 2010; European Commission 2017], whereas economic efficiency is not the only criterion for assessing EU budget expenditure for agricultural policy. Supporting small farms is justified by the belief that in the long run and when we consider all the advantages and costs of their business activity, these farms may turn out to be effective both economically and environmentally. To understand this approach better, it is worth presenting the sector of small farms in different European Union Member States. In this chapter, the example is Poland, where the development of agriculture and rural areas in the past has been based on small farms. Where even in conditions of collectivisation of agriculture, this type of unit dominated. The aim of this paper is to determine the position of small farms in the agricultural sector, as well as to present their role and the ways of supporting them. This

study is based mainly on data from Central Statistical Office, Farm Accountancy Data Network and Eurostat, as well as source materials and thematic papers.

2.2. Polish agriculture in the 21st century

When we track economic development in highly developed countries, it is possible to identify 3 consecutive phases. In the first phase, agriculture produces a large share of the gross national income and there is high employment in this sector. The second phase means moving on to industrial economy. In the last phase, the significance of services increases from the point of view of the national income. It includes intangible and financial services, and nowadays also services based on information technology (the so-called digital economy). At the same time, raw materials no longer play such an important role in the structure of the generated value added and employment. An example of such a transformation is Polish economy and its agricultural sector.

At the end of the 2010s, Polish agriculture generates about 2.5% of GDP, whereas in 1990 it was 9%. Investment expenses constitute only 2% of total investment in Poland, whereas the share of gross fixed assets is slightly over 4%. Moreover, this transformation manifests itself in deagrarianisation, that is the decline in employment in agriculture, from 25% of the total workforce in 1990 to about 12% now [Stępień 2019]. The total area of agricultural land is more stable. It amounts to 14.7 million hectares, that is over 2.5 million hectares less than in the 1990s. In this area, there are over 1.4 million farms with an average area of about 10 ha of UAA (an increase by more than 3 ha within 20 years). Most of them are small 5 ha farms, whereas farms with an area of over 50 ha constitute less than 2.5% [Central Statistical Office 2019]. If we take into account economic strength, expressed as standard output (SO),¹ 2/3 of Polish farms fall within the 0–8 thousand euros category, whereas the next 12% fall within the 8–15 thousand euros category. By comparison, in Germany, a little bit over 20% of farms fall within the 8–15 thousand euros category, whereas in France this number reaches 26% [Eurostat 2019]. The regional structure of farms

¹ SO – Standard Output is the average production of 5 years of the crop or animal production expressed in euro in the region's average production conditions.

is still highly diversified. The smallest farms are dominant in southern Polish provinces, whereas the biggest ones are located mainly in northern and western provinces. This process is influenced by multiple historical, economic, social and cultural factors, related strictly to agriculture or to its environment [Baer-Nawrocka and Poczta 2018]. Agricultural lands which used to belong to state-owned agricultural holdings became a resource that made it possible to develop big and privately-owned farms.

Even though the area structure of agricultural holdings is improving, this process is relatively slow. The agrarian structure is still fragmented, which predetermines a relatively low (as compared e.g. with Western European countries) level of production and specialisation. The market is dominated by entities involved in mixed production. Crops have the highest share in plant production, whereas livestock production is dominated by pigs and poultry [Central Statistical Office 2018]. At the same time, in recent years, we have observed the process of regionalisation. There are areas with above-average concentration of specific types of agricultural activity. In central western Poland, farmers opt mostly for breeding pigs and poultry, as well as for cultivating crops and corn (also for fodder). The central eastern part of the country was adapted for orchard cultivation. The cultivation of intensive crops, sugar beet and rape are more common in the south eastern and western part of the country, whereas north eastern Poland focuses on breeding dairy cattle. In submontane and mountain regions, there are mostly small farms, dealing with diverse plant and animal production.

**Table 1. Basic characteristics
of Polish agricultural sector (2018 data)**

Specification	Value
Share of agriculture in GDP	2.4%
Share of investment in agriculture in total investment in Poland	2%
Share of gross fixed assets in agriculture in total assets in Poland	4.2%
Share of employment in agriculture in total labour force	11%*

* The division of employed persons by occupational category, including those employed in agriculture and elsewhere, was based on the criterion of the main workplace. In the case of division of employed persons by sections and divisions, employment in agriculture reaches almost 16%.

Specification	Value
Utilised agricultural area (UAA)	14.7 million of ha
Number of farms (above 1 ha of UAA)	1.4 million
Average size of farm	10 ha UAA

Source: Self-performance based on Central Statistical Office 2018; Central Statistical Office 2019.

Due to a relatively high number of farms² and the area of agricultural land, in the years 2017–2018 Poland occupied the seventh position among EU Member States with regard to the volume of agricultural production (Poland was outrun by France, Germany, Italy, Spain, the United Kingdom and the Netherlands) [Eurostat 2019]. Since the beginning of the 21st century (that is for almost 20 years), the value of real global production increased by almost 30%. This growth was caused mainly by higher volume, which shows that there was an improvement in the efficiency of using the factors of production (land, labour and capital). As production grows, foreign trade in food products intensifies as well. In this regard, a positive factor was Poland's accession to the European Union in 2004. After 15 years of being a Member State, Polish export of agricultural and food products accounted for 13% of all export, whereas import reached less than 9%. In 2018, positive balance amounted to 9.7 million euros, whereas negative balance for total foreign trade was -4.6 million euros [Ministry of Agriculture and Rural Development 2019]. The main recipients of Polish food were the 'old' EU states, that is Germany, the United Kingdom, the Netherlands, Italy and France. The share of all EU countries in the export of agricultural and food products amounted to 83%. It is interesting especially because international competitiveness is assessed mainly through the lens of labour productivity. Yet when it comes to Polish agriculture, it is much lower than in the above mentioned countries. So what lies behind the success of Polish export? One of the causes behind this phenomenon is the nature of agricultural production. It is less intensive when it comes to using resources (including fertilisers and plant protection products) and closer to traditional

² In 2016, workers employed in Polish farming constituted almost 1/5 of workers employed in farming across the EU, which almost equalled all such workers from France, Spain and the UK put together.

farming, which guarantees the production of food valued by European consumers. In this case, Poland kind of benefits from its underdevelopment, which is treated as a strong side of the Polish agricultural sector [e.g. Czyżewski and Stępień 2011]. The second factor is the influx of foreign investment, including food corporations which benefit from lower labour costs and export agricultural raw materials which were processed in Poland. Moreover, it needs to be noted that Polish plants which process agricultural and food products, as well as distribution networks, were modernised with the help of pre- and post-accession EU funds. Even though the agricultural sector could be regarded as ‘backward’ in comparison with highly developed countries, Polish food industry belongs to the most advanced in Europe.

A problem of Polish agricultural holdings is the continuing disparity between agricultural and non-agricultural income, even though in recent years, this situation has improved due to the influx of EU funds, mainly from the Common Agricultural Policy. Thanks to these funds, in the years 2004–2016, the nominal per capita income of inhabitants of rural areas increased by 118%, whereas the income of city dwellers increased by 94% [Wilkin 2018]. If only agricultural holdings are taken into account, this income increased by over 150%. Therefore, in terms of income, farmers are the social group which benefited the most from Polish integration with the EU. Nevertheless, in the years 2004–2014, the ratio between agricultural income (for FADN farms³) and the average wage level in the national economy, after taking into account payments from the Common Agricultural Policy, reached 66%. If we did not include this EU support in the value of agricultural income, this ratio would be over a half lower and amount to just 29% [Stępień, Smędzik-Ambroży and Guth 2017]. Due to the relatively low level of agricultural income, only one fourth of agricultural holdings make a living mostly from agriculture (i.e. agricultural income constitutes over 50% of their total household income). However, an increasing number of people find jobs in non-agricultural sectors, which bring higher income than farming,

³ FADN (Farm Accountancy Data Network) is a European system of sample surveys conducted every year to collect micro-economic farm data. The FADN data collection is based on a sampling frame that provides a sample representative of the agricultural sector. Farms covered by the FADN accounting system are economically stronger as compared to other farms, so it may be concluded that the results achieved by them are higher than the average results on a national level.

whereas the Polish social insurance system and social assistance provide support for many inhabitants of rural areas.

2.3. Definition and role of small farms in Poland

Before we move on to discuss data concerning small farms, it is necessary to establish the criteria to define the term ‘small farm’. The diversity of the agrarian structure in EU Member States and around the world makes it impossible to clearly define a ‘small’ farm [Guiomar et al. 2018]. There are many answers to the question ‘what is a small farm’. It depends on the context in which this issue is handled. We usually take into account the physical size of a given farm, expressed in hectares of agricultural land, regardless of the type of agricultural production. This methodology is used e.g. by Food and Agriculture Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD) and the World Bank. However, the area-based criterion for defining a small farm differs from country to country. It is usually defined as an area of less than 1, 2 or 5 ha of agricultural land. For example, according to the methodology of the European Union, a small farm is a farm whose area does not exceed 5 ha of agricultural land (in the EU, there are over 7 million such farms out of 10 million farms in total).

In Poland, there is no single official definition of a small farm. Different criteria are used in order to determine the number of such farms [Hornowski and Kryszak 2016], but the area of agricultural land is the most common one. In literature on this subject, there are various classification proposals. It is for example concluded that a very small farm has an area of up to 5 ha, whereas a small farm has from 5 to 30 ha [Żmija et al. 2013]. Gruchelski and Niemczyk [2016], on the other hand, define a small farm as a farm that has an area of up to 10 ha, whereas a relatively small farm has up to 19 ha.

Apart from the physical size of a farm, it is important to determine its economic strength, measured with the help of standard output (SO), which used to be expressed as European Size Unit (ESU). Physical size is not always correlated with production results. In other words, when it comes to industrial production (e.g. pig or poultry fattening), a large area of agricultural land is not required to obtain high revenue. Including economic strength among classification

criteria makes it possible to account for such situations. For example, Eurostat and FADN employed a methodology in which the upper limit for small farms is 25 thousand euros of SO (there are over 9 million such farms in the EU, including 8.5 million below 15 thousand euros).

Still another concept is to treat the workload as the criterion for determining whether a farm should be regarded as small, medium or large. It is justified due to the fact that small farms usually have a lower total workload than larger farms. The word ‘total’ is very important here, because the ratio of workload consumption changes per unit of area. Estimated data show that Polish farms with a small area of agricultural land require a relatively high workload per 1 ha (on average, it is about 300 hours). As the physical size of a farm increases, the employment figure per one unit of area decreases [Dudzińska and Kocur-Bera 2013]. Moreover, when we take into account the employment figure, it needs to be noted that it is more appropriate to take into account full-time agricultural workers (which is often expressed in Annual Work Unit, AWU⁴) rather than just natural persons, who often engage in work on a part-time basis. In this approach, it is assumed that a small farm uses 0.5–1.5 AWU per year.⁵ Finally, classification by workload requires taking into account the business focus of a given farm. A classic example is horticulture, which is highly labour-consuming as compared to other forms of agricultural production, so it may not be compared with cultivating crops or industrial plants.

In order to supplement the above mentioned characteristics and emphasize the difference between small and large farms, we could take into account the level of on-farm consumption. In this sense, a farm is regarded as small if it consumes the majority of its output on its own. If we adopt this criterion, agricultural holdings can be divided into existential ones, which engage in production

⁴ Annual Work Unit (AWU) corresponds to the work performed by one person who is occupied on a farm on a full-time basis (in Poland – 2120 hours per year). Full-time means the minimum hours required by the relevant national provisions governing contracts of employment.

⁵ According to FADN data, in 2017 only agricultural holdings with economic size of up to 2–8 thousand SO fell within these limits and consumed 1.1 AWU on average. The remaining groups were as follows: 8–25 thousand euros – 1.52 AWU, 25–50 thousand euros – 1.84 AWU, 50–100 thousand euros – 2.10 AWU, 100–500 thousand euros – 3.19 AWU, above 500 thousand euros – 19.05 AWU (FADN, 2019).

mostly to satisfy their own needs (subsistence farms), semi-subsistence farms and commercial farms (which sell most of their output). It is sometimes assumed that small farms are those which use over half of their output to satisfy their own needs [Žmija et al. 2013]. In literature on this subject, one may also come across a definition of semi-subsistence farms which states that such farms sell less than 50% of their output [Wharton 1969]. Among other criteria used to classify agricultural holdings, there is also the method of managing an enterprise, using agricultural contract work, the share of non-agricultural business activity, the degree of specialisation, the development of technology and innovations, risk management, the support received from an agricultural policy (e.g. 1250 euros of yearly direct payments for small farms), as well as other factors.

The criteria adopted for small (or very small) agricultural holdings are usually fulfilled by family farms, even though this group is very much diversified. Apart from owning agricultural land and conducting agricultural activity, family farms are characterised by the fact that agricultural work is carried out by family members. The fundamental thing is that family work should prevail in total labour inputs. Therefore, the household is functionally linked with the agricultural holding, not only through the provision of work, but also due to a high degree of self-supply. The aim of such an entity is existential activity (which includes generating income) rather than profit, as is the case with private enterprises [Zegar 2012].

To sum up, due to a wide variety of approaches towards the qualifying criteria for small agricultural holdings, the idea that seems to be the most appropriate is to take into account several elements at once, e.g. the area of agricultural land, the standard output and labour inputs [Zegar 2012]. What is also important in defining is taking a relative approach towards different countries or regions. Otherwise, what makes a small farm in one country does not have to be regarded as a small farm in another country [European Commission 2011]. Having presented the qualifying criteria for small farms, it is worth thinking about the role that these entities play in the functioning of the agricultural sector and its environment. First of all, it needs to be admitted that due to the number of these entities in Poland, they are the foundation of the agrarian structure and remain a major player in the field of food production. By combining the production and consumption functions, they support many families in rural areas. Because of that, their fight for survival is stronger than in the case of large-scale farms with

contract workers. What is also important in this context is the farmer's personal and emotional connection with the farm, which translates into motivation and high quality of work. Moreover, small farms, as opposed to large industrial ones, 'produce' something more than just agricultural raw materials. Their multifunctionality manifests itself in efforts to maintain the sustainability of rural areas in the social and environmental context. Benefits from such actions include [Czyżewski and Stępień 2013]:

- broadly defined diversification of ownership, plant and animal production, landscape, culture and tradition;
- responsible management of natural resources, water and forests, as well as maintaining animal welfare;
- creating jobs in rural areas, building social ties, greater responsibility for one's own life and the life of the local community, as compared with contract workers;
- combination of one's workplace and family life, gaining knowledge and experience from an early age;
- provision of relatively cheap food produced in a more traditional way, which is tastier and healthier.

In light of the above, it should be concluded that small and medium agricultural holdings in Poland should be protected. Moreover, what should be emphasized is their strategic significance for securing food needs and the necessities of life, also during economic, political and military crises. This issue should become a priority due to the long-lasting deactivation of small farms, changes in their business focus and the lack of successors. Small agricultural holdings cannot be treated as a reserve of cheap land, easily accessible natural resources and cheap workforce, which induces large agricultural producers and entrepreneurs active in the agricultural and food market to compete for these small farms. They need to have appropriate conditions for revitalisation. Apart from developmental (investment) support, there need to be some provisions concerning potential markets (including direct and local sale) and links with the food processing industry.

2.4. Small-scale farms in statistics

For the purposes of this analysis, I adopted the area criterion (10 ha of agricultural land) and the economic size criterion (15 thousand euros SO). Even though these are just conventional limits, they seem to be appropriate for describing small-scale agriculture in Poland. And so, in Poland the number of entities whose area does not exceed 10 ha of agricultural land is about 1 million, which represents $\frac{3}{4}$ of all agricultural holdings. However, in the last ten-odd years, there was a significant drop in their number, especially severe in the case of the smallest farms, whose area does not exceed 2 ha of agricultural land (see Table 2). This process was accompanied by the shrinking of the area used by small farms (Table 3). What is clearly visible is the transfer of agricultural land to stronger agricultural producers. Small entities go out of business naturally (as their owners are getting old) or because family members decide to change their business focus. The diversity of farm structure still stands on the regional level. The highest share of small-scale farms was recorded in south eastern Poland, whereas the lowest share was recorded in the north eastern part of the country.

Table 2. Number of small farms (thous.) in Poland by agricultural area

Specification	2005		2010		2013		2017	
	number	%	number	%	number	%	number	%
Total number of farms (thous.)	2,476	100	1,509	100	1,429	100	1,406	100
Including farms (thous.):								
up to 1 ha UAA	1,218	49.2	25	1.6	34	2.4	21	1.5
1–1,99 ha UAA			301	19.9	278	19.4	263	18.7
2–4,99 ha UAA	533	21.5	490	32.6	455	31.8	450	32.0
5–9,99 ha UAA	370	14.9	346	22.9	315	22.1	316	22.5

Source: Self-performance based on Central Statistical Office 2018; Central Statistical Office 2017.

Table 3. Structure of agricultural land use in small farms in Poland by agricultural area

Specification	2005		2017	
	Area	%	Area	%
Total agricultural area (thous. of ha)	14,755	100	14,620	100
Including farms (thous. of ha):				
up to 1 ha UAA	865	5.9	17	0.1
1–1,99 ha UAA			389	2.7
2–2,99 ha UAA	1,727	11.7	459	3.1
3–4,99 ha UAA			987	6.8
5–9,99 ha UAA	2,635	17.9	2,205	15.1

Source: Self-performance based on Central Statistical Office 2018; Eurostat 2019.

Similar conclusions may be drawn on the basis of an analysis of data concerning the economic strength of agricultural holdings (Table 4). Moreover, in this case, we can see a significant drop in the number of economically weakest entities, mostly those which fall within 0–2 thousand euros group, and in their share in the total number of agricultural holdings in Poland (the 8–15 thousand euros group was the only one where it rose slightly). The convergence of results should not come across as surprising if we consider the fact that there is a close relationship between the physical size of a farm and its economic strength. Table 5 shows how the area of agricultural land increases with the increasing economic strength. Moreover, the range with the highest number of agricultural holdings shifts in particular area groups. Most farms with economic strength of 0–2 thousand euros have 1–2 ha of agricultural land, whereas most farms that fall within the 4–8 thousand euros and 8–15 thousand euros groups have 5–10 ha of agricultural land. Therefore, it may be assumed that the data for farms divided with regard to their physical and economic size will be very similar. This is why we will classify farms by the area of agricultural land (except for data concerning economic results).

Table 4. The number and percentage of small farms in Poland by the economic size SO

Economic class SO	2005		2010		2013		2016	
	Number	%	Number	%	Number	%	Number	%
0–2 thous. euro	1,402,600	56.6	485,400	32.2	402,781	28.2	391,344	27.7
2–4 thous. euro	338,560	13.7	290,340	19.2	283,509	19.8	269,775	19.1
4–8 thous. euro	300,820	12.1	274,240	18.2	262,110	18.3	252,788	17.9
8–15 thous. euro	205,370	8.3	195,020	12.9	183,607	12.8	184,704	13.1

Source: Self-performance based on Central Statistical Office 2017; Eurostat 2019.

Table 5. The average size and land use structure of small farms in Poland by the economic size SO in 2016

Specification	Economic size (SO in euro)			
	0–2	2–4	4–8	8–15
Average size (ha UAA)	2.2	3.6	5.8	9.2
Structure of farms by area class (ha UAA) in %:				
up to 1	3.5	1.0	0.2	0.5
1–2	53.0	16.1	6.0	1.4
2–3	26.5	22.9	10.5	4.0
3–5	14.5	40.1	26.6	13.5
5–10	2.2	19.4	47.2	43.6
More than 10	0.3	0.5	9.4	37.1

Source: Self-performance based on Central Statistical Office 2016.

In agricultural holdings, small area of agricultural land determines how efficiently workforce can be used. Even though general inputs in an average farm are lower than in larger holdings, when it is expressed per 1 ha of agricultural land, the use of this factor of production is actually four times higher (Table 6). Moreover, small farms are more often than large farms managed by older people with lower education. It could be one of the reasons for relatively low absorption of EU funds from the Rural Development Programme and the lower tendency to undertake non-agricultural activity, which is particularly advisable in this group. Due to the small scale of their business activity, less than 70% of small farms sell their output, whereas in larger farms this number reaches almost 100%. At the same time, almost $\frac{1}{4}$ of small farms use over 50% of their agricultural output to satisfy their own needs (in farms with an area over 10 ha it is just 2.4%).

Table 6. Selected characteristics of small farms in Poland against the background of larger farms in 2016

Specification	Farms up to 10 ha UAA	Farms above 10 ha UAA
Annual labour inputs in AWU per 1 farm	0.94	1.91
Annual labour inputs in AWU per 1 ha UAA	0.24	0.06
Share of farms managed by male	66%	87%
Share of farms according to the age of manager:		
below 40 lat	18%	28%
40–64 years	68%	67%
65 and more	14%	5%
Education of manager:		
primary education/no education	13%	7%
vocational education	37%	33%
vecondary education	37%	41%
higher (bachelor or master degree)	13%	19%
Share of farms conducting non-agricultural activities	2.6%	4.9%

Specification	Farms up to 10 ha UAA	Farms above 10 ha UAA
Share of farms selling their own agricultural products over a period of last 12 months	68%	98%
Share of farms consuming more than 50% of their own agricultural production	23.5%	2.4%
Share of farms with direct sales over 50% of the total sales of agricultural products	19%	10%
Share of farms using ecological methods of production	0.4%	7%
Share of farms benefiting from support under RDP	48%	68%

Source: Self-performance based on Central Statistical Office 2017.

On the other hand, when it comes to small producers, the share of those who sell over half of their output through direct sale is higher than in the case of larger farms. Using these sales channels is gaining popularity due to the fact that consumers are more and more interested in food produced in a traditional, natural and environmentally sound manner, characterised by natural seasonality and high biological value [Sieczko 2015; Domański and Bryła 2013, pp. 97–109]. For small farms, it is an opportunity to find an alternative source of income. The lack of organic production certificates (only 0.4% of small farms conduct such a business) should not become a barrier to the development of small farms.

Agricultural land use structure in small farms varies significantly (Table 7). In comparison with larger holdings, the share of sown land is lower (especially in the smallest farms), whereas the share of meadows and forests is higher. Therefore, we should look at this matter through the lens of environmental impact. If meadows and forests are treated as a sort of public good, small farms are more focused on providing this type of goods than large-scale agricultural holdings. Moreover, small farms use less inorganic fertilisers. Lower intensity of breeding cattle and pigs (Table 8) also means that they generate less liquid manure and dung. Therefore, the data show that in comparison with large-scale farming, small farms in Poland are more environmentally sustainable.

Table 7. The structure of agricultural land use and fertilisers consumption on farms in Poland by the area of UAA in 2016

Specification	Area group (ha UAA)				
	1–2	2–3	3–5	5–10	>10
sown land	40%	45%	51%	58%	70%
permanent meadows	26%	23%	21%	18%	16%
permanent pastures	2%	2%	2%	2%	3%
parmanent crops	3%	4%	4%	4%	2%
forests and forest land	12%	12%	11%	9%	4%
other land	17%	14%	12%	8%	5%
fertilisers consumption* kg per 1 ha UAA	63.1	73.1	85.2	105.8	152.0

* nitrogen, phosphorus potassium

Source: Self-performance based on Central Statistical Office 2016.

Table 8. The scale of animal production on farms in Poland by the area of UAA in 2016

Number of animals (pcs.)	Area group (ha UAA)				
	1–2	2–3	3–5	5–10	>10
Cattle per 1 farm	2.4	3.1	3.9	7.5	29.1
Cattle per 100 ha UAA	8.0	12.6	16.6	32.4	47.6
Pigs per 1 farm	6.8	9.1	11.5	20.3	115.7
Pigs per 100 ha UAA	10.0	15.7	24.7	50.5	89.9
Poultry per 1 farm	82.1	111.9	125.1	215.1	647.5
Poultry per 100 ha UAA	1,815.6	1,558.9	1,198.8	1,196.7	722.3

Source: Self-performance based on Central Statistical Office 2016.

However, even though from the environmental point of view small farms can be regarded as more sustainable, in the case of microeconomic calculation the results that they achieve are much lower than those of larger entities. Table 9 presents data for small farms covered by the FADN system which fall within different economic size groups. Let us remember that according to the FADN classification, small agricultural holdings are those which reach up to 25 thousand euros of standard production. It is clearly visible that both the productivity and the profitability of these small-scale producers deviate from the average results achieved by large-scale farms. Particularly large differences are visible in data expressed in workforce units. When it comes to standard production, the difference between the lowest (2–8 thousand euros) and the highest (over 500 thousand euros) class is over thirteen times larger, similarly to the difference in income between the lowest class and the 100–500 thousand euros class.

Table 9. Economic results of farms in Poland by classes of economic size in 2017

Farm economic size SO (euro)	Total output/ AWU	Total output/ 1 ha UAA	Farm net income/ AWU	Farm net income/ 1 ha UAA
2 000–8 000	5,537.0	862.4	1,483.2	231.0
8 000–25 000	9,909.2	1,078.2	3,703.9	403.0
25 000–50 000	19,455.4	1,500.3	8,341.3	643.3
50 000–100 000	34,452.4	1,831.6	14,616.2	777.1
100 000–500 000	60,172.7	2,227.1	19,629.2	726.5
>500 000	74,889.7	2,558.8	7,279.8	248.7

Source: Self-performance based on Farm Accountancy Data Network, 2019.

2.5. Policy towards small farms in Poland

As the paradigm of agricultural development evolved, the approach towards small farms changed as well. Even a few decades ago, they were treated as underdeveloped and inefficient, which meant that they were an obstacle on the path towards the modernisation of the agricultural sector. Agricultural policy

focused on large farms, whereas small farms were advised to combine their agricultural production or give it up altogether. An example of such actions was collective farming in Poland after the Second World War and the establishment of state agricultural farms. Since the 1990s, this situation started to slowly change. It was partially the result of political factors (the liquidation of state agricultural farms and a large part of agricultural cooperatives) and partially due to the growing consciousness of negative results brought about by the industrial model of the food industry and the growing importance of multifunctional farming [Zegar 2012]. For several years, we have observed increasing efforts to strengthen the position of family farming, which is a result of changing the focus of the Common Agricultural Policy. The attitude of authorities towards small agricultural holdings is evidenced by the quoted excerpt from Sustainable Development Strategy for Rural Areas, Agriculture and Fishery for the years 2012–2020 [Ministry of Agriculture and Rural Development 2012]: ‘(...) they play a vital environmental and social role. Despite their low commercial production capacity, they have the potential to produce traditional local food or niche products. At the same time, the structure of agricultural land belonging to small-scale farms brings added value to maintaining landscape and environmental assets.’ In Sustainable Development Strategy for Rural Areas, Agriculture and Fishery for 2030 [Ministry of Digitization 2019], the multifunctional nature of small and medium farms is emphasised by ‘(...) extending (supplementing) the scope of current production functions to provide services to inhabitants of rural areas and city dwellers, as well as to the environment.’

The above quotes show that the viability of small agricultural holdings in Poland is of overriding importance. This is the aim of practical solutions under intervention policy. Support trends can be divided into four groups: 1. developing agricultural production; 2. diversifying business activity; 3. transferring one’s farm to another farmer; 4. administrative facilitations. In the years 2014–2020 (EU budgetary outlook), the first point is going to be addressed with the help of an action called ‘Restructuring Small Farms’ (total budget 750 mln euros), which constitutes a part of Rural Development Programme 2014–2020. Support is granted to farms with economic size of up to 6 thousand euros of SO for restructuring the production of agricultural products, preparing them for sale, selling them directly or processing them [The Agency for Restructuring and Modernisation of Agriculture 2019]. When it comes to the addressed problem,

this programme is similar to the support programme aimed at small-scale agricultural holdings which was carried out after 2004 [European Parliament 2013]. Unfortunately, the new programme is limited to producers who are engaged exclusively in agricultural activity. It is clearly contrary to the nature of small farms, whose essence should be both agricultural and non-agricultural activity. When it comes to diversification, a small agricultural holding (up to 15 thousand euros) may apply for a bonus to start non-agricultural activity (RDP 2014–2020, total budget above 400 million euros). Moreover, Rural Development Programme 2014–2020 also includes a special payment for farmers qualifying for the small farm system who permanently transferred their holdings to another farmer (30 mln euros budget). The requirement is that the acquiring person needs to undertake to conduct agricultural activity in the extended farm for at least 5 years [The Agency for Restructuring and Modernisation of Agriculture 2019]. Therefore, this solution is similar to the so-called structural pensions granted in the years 2004–2013. Still another way of supporting small farms was the establishment of a simplified direct payment system within the first pillar of the Common Agricultural Policy, which came into being in 2015. The system was open for farmers who received direct payments of up to 1,250 euros per year, that is those who owned farms with about 5–6 ha of agricultural land. In this case, facilitation means the relaxation of criteria for checking compatibility with cross-compliance⁶ and greening⁷ rules with regard to direct payments, which simplifies the procedure of granting these payments.

The policy towards small and medium farms in Poland is also evidenced by the redistribution of support through targeted direct payments. As is shown by multiple studies [e.g. European Commission 2015; Matthews 2016; Bournaris and Manos 2012; Swinnen 2015], the allocation of area payments to small and large farms is highly unequal. As a result, there is a disproportion between the cumulative participation of beneficiaries and the cumulative amount of transfers from the EU budget, expressed as 80/20. It means that 80% of the economically

⁶ Cross-compliance is a mechanism that links direct payments to compliance by farmers with basic standards concerning the environment, food safety, animal and plant health and animal welfare, as well as the requirement of maintaining land in good agricultural and environmental condition.

⁷ Greening is an element of direct payment, introduced by the 2013 CAP reform, which financially rewards farmers for taking care of the environment.

weakest agricultural holdings in the EU receive 20% of all resources for the Common Agricultural Policy subsidies, whereas 20% of the strongest farms receive 80% of available support. This situation is similar in Poland. When it comes to the division of farms into economic classes (FADN farms data), due to subsidies from the Common Agricultural Policy, in the years 2004–2013 there was an increase in the agricultural to non-agricultural income ratio in each of these economic classes. However, this influence was varied and ranged from almost 9 percentage points for the smallest farms (up to 8 thousand euros of standard output per year) up to 2000 percentage points for the biggest farms (above 500 thousand euros of standard output). It was characteristic that the higher a given farm's output (which determined its economic class), the higher the positive impact of CAP subsidies on the income level. Similarly, the share of subsidies in agricultural income for farms from the lowest economic class reached 36% in the years 2004–2013, whereas in the highest economic class it was 159%. In light of the above, it was appropriate to introduce the so-called first hectare payment. Since 2015, owners of land covered by uniform area payments with an area over 3 ha have received additional payments for acreage which does not exceed 30 ha. Thanks to it, total support per area unit increases by about 20%. In its justification for the programme, the government states that targeting additional payments in this way 'will make it possible to more effectively support the income of those farms which cannot benefit from the scale of their production as much as the biggest farms, but still stand a chance for sustainable development' [Pokora-Kalinowska 2019].

2.6. Conclusions

An integral part of the sustainable development model for Polish agriculture are small family farms. They set biodiversity against large-scale production, environmental sustainability against modern technology and a high quality of food against industrial manufacturing methods. Small farms constitute a buffer protecting rural areas against poverty, they shape rural landscape and transmit intangible cultural and historical values [Michalska 2012]. Their presence is conducive to maintaining the demographic potential of rural areas and local economy, including the circulation of income between entrepreneurs and

consumers. Therefore, they are a precondition for the development of rural areas in Poland, even if their existence seems to be unjustified from the microeconomic point of view. Nevertheless, the microeconomic criterion is superficial because long-term costs of liquidating such entities would be enormous, not only in the economic sense, but also in the social and environmental context.

Therefore, when it comes to choosing between the two paths for the development of agriculture, that is supporting small farms or leaving them in the conditions of free market game, it is definitely the first solution that should be chosen. It is not only about passive social assistance, but rather about actions which will turn small family farms into active participants in the economic and social life in rural areas. The only thing we need to do is define the functions which such entities should fulfil. One of them is definitely the provision of public goods, which is generally not guaranteed by large agricultural holdings. It is about maintaining biodiversity, the rural landscape and clear environment, as well as about transmitting our cultural heritage. Small farms should be rewarded for being 'the guardians of the landscape' because this function is not appreciated in the market. Possible solutions are e.g. payments for the number of hectares on which erosion was counteracted, for the amount of carbon bound in soil, for profits lost due to the fact that a given farm does not use fertilisers and plant protection products. These types of actions could be remunerated as a bonus added to the basic direct payment (including the flat fee). Its source could be ecological taxation, levied on large-scale agricultural holdings (the criteria defining a large-scale agricultural holding are yet to be established). This solution should not provoke public opposition, so implementing it would be easier.

Still another form of support is subsidising the process of adjusting a farm to a chosen type of business activity (be it agricultural or non-agricultural activity) and providing counselling. Small agricultural holdings should choose a strategy which fits their limited possibilities but at the same time guarantees an adequate income. When it comes to agricultural production, it could be organic, traditional or niche food. Small producers, who are not of interest for big trade networks, can successfully cooperate with nearby processing plants and establish so-called local food systems. Examples of such actions can be found for instance in the United States. Small farms may also undertake activities closely related to agriculture, such as herbal production, beekeeping and floriculture, or other non-agricultural forms of business activity (food processing, handicraft, agritourism,

workshops). To conclude, when we come up with solutions for small farms, it is important to bear in mind that they should serve as an incentive for modernisation and finding one's place in specific local markets, rather than constitute mere examples of social assistance.

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CHAPTER 3. Small farms in Romania

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Abstract

Agriculture in Romania employs most rural inhabitants, and most farms are below 5 hectares. There are 3.4 million farm holdings, most of which are family farms with extensive semi-natural grassland pastoral systems and mixed farming systems. These semi-natural small-scale farms are of significant economic importance. More than one million holdings between 1 and 10 hectares (comprising 3.3 million hectares) are classed as semi-subsistence farms, producing for local sale or for the farmer's own consumption and that of the extended family. Although small farms constitute 95% of all farms, they manage only 38% of arable land and produce an estimated 25–30% of the nation's food products. Family farm activities are not limited to agriculture. They also comprise important social activities for the community and family, preserve traditions and crafts, attract rural tourism and agritourism, and help to protect the environment through extensive agricultural practices. Yet they have very little economic strength. This paper presents the situation of small farms in Romania to show their characteristics and features, as well as the problems and challenges they face. Small farms in Romania are discussed in the context of the European Union to show differences in their functioning and the resulting consequences.

Keywords: small farms, agriculture, Romania

JEL codes: Q10, Q12, Q18.

3.1. Introduction

Agriculture plays a significant socio-economic role in Romania and its transformation to a modern, vibrant, and market-oriented sector is central to fighting poverty, promoting social inclusion, and reducing the urban/rural development divide. Most of Romania's poor people live in rural areas and earn their living through agriculture and agriculture-related activities. The agricultural sector ensures food security and is a major source of employment, income, and economic activity in rural areas. The sector represented 4.1% of gross domestic product (GDP) in 2017 and 4.7% of GDP in 2015 [Eurostat 2018]. In 2016, the agricultural sector output reached EUR 15.3 billion, which generated EUR 8.8 billion in demand for inputs, including EUR 2.6 billion worth of foodstuffs; EUR 1.6 billion from the energy sector; EUR 1.7 billion from seeds, planting, and fertiliser suppliers; EUR 0.7 billion from materials and building suppliers; EUR 290 million in veterinary expenses; EUR 200 million in extension services, and EUR 2.0 billion in demand for other goods and services throughout the economy [Tebaldi and Gobjila 2018]. Romania's agriculture is characterised by a high number of very small non-commercial farms, and most farm holdings have a very small economic size. In 2013, very small (with output less than 2 thous. euro) and small farms (with output between EUR 2,000 and EUR 8,000) accounted for 94.9% of all the farms in Romania. In the EU-28, the same sized farms constituted 69.1%. Romania ranks first in the share of very small and small farms among the European Union countries. According to Page and Popa [2013], the large number of small-scale holdings is an important source of economic, cultural, social and natural strength for Romania. However, Otiman [2013] argues that there is a correlation between the existence of very large farms (over 2,000 ha) in certain areas and severe rural poverty. He points out that in the poorest regions in Romania there are often many large farms, while small farms are located in the northern and central parts of Romania – in these regions people do not suffer as much because of poverty. This may be because small farms can produce agricultural products and food for their own consumption. Thus they strengthen and ensure food security, which reduces the scale of poverty. In recent decades it has been increasingly argued that the viability of rural areas cannot depend only on agriculture, but they should also strengthen their role in protecting the rural environment, producing

safe and quality food, and, broadly seen, providing public goods, while helping to keep rural areas attractive for young people and for those to be born.

3.2. Agricultural sector in Romania – basic information

Table 1 presents basic data on Romanian agriculture in the context of the European Union. Utilised agricultural area (UAA) in Romania occupies 12.5 million ha, i.e. 7.2% of the total area of UAA in the entire European Union, while the share of farmland in Romania is about 53% of the country's total, compared with 40% for the EU-28. This illustrates the agricultural potential of Romania and that its land is used well. In 2016 the area used by agricultural holdings was 4.2% less than in 2013, according to the Farm structure survey [National Institute of Statistics 2013], and 6% less, according to the General Agricultural Census [National Institute of Statistics 2010].

Table 1. Romanian agriculture, forestry and fisheries in the context of the European Union's data

Specification		Year	Romania	EU-28	Romania's share of the EU-28
Farms and farmland	Farmland (utilised agricultural area) in million ha	2016	12.5	172.97	7.2%
	Share of farmland in total land area	2016	53.4%	39.8%	–
	Number of farms (agricultural holdings) in million	2016	3,422,030	10,467,760	32.7%
Farmers	Number of persons employed in agriculture	2016	1,960,300	9,720,600	20.2%
	Employment in agriculture – share of total employment	2016	23%	4.2%	–
	Young farmers (under 40 years old) – share of all farm managers	2016	7.4%	10.6% a	–
	Female farmers – share of all farm managers	2016	33.6%	28.5% a	–

Specification		Year	Romania	EU-28	Romania's share of the EU-28
Farmers cont.	Farmers with full agricultural training – share of all farm managers	2016	0.4%	9.1% a	–
Economic performance of agriculture	Contribution of agriculture to Gross Domestic Product – share of GDP	2017	4.1%	1.2%	–
	Gross value added (at basic prices) in million EUR	2017	7,845	188,460	4.2%
	Value of agricultural output (production value at basic prices) in million EUR	2017	17,480	432,602	4%
	Value of crop output in million EUR	2017	11,851	218,918	5.4%
	Value of animal output in million EUR	2017	4,113	176,883	2.3%
Agricultural production	Cereals in thous. tonnes	2017	27,139	310,058	8.8%
	Root crops in thous. tonnes	2017	4,584	199,304	2.3%
	Permanent crops in thous. tonnes	2017	2,471	64,827	3.8%
	Fresh vegetables in thous. tonnes	2017	2,065	72,879 b	3%
	Raw milk in thous. tonnes	2017	4,439	170,120	2.6%
	Bovine meat in thous. tonnes	2017	59	7,803	0.8%
	Pig meat in thous. tonnes	2017	328	23,362	1.4%
Forestry	Poultry meat in thous. tonnes	2017	405	14,464	2.8%
	Forest and other wooded land in thous. ha	2015	6,951	181,918	3.8%
	Persons employed in forestry and logging in working units	2015	46,690	488,530	9.6%
	Gross value added (at basic prices) in million EUR	2015	641	25,836	2.5%
	Roundwood (in the rough) in thous. cubic metres	2016	15,117	458,165	3.3%

Specification		Year	Romania	EU-28	Romania's share of the EU-28
Fisheries	Fishing fleet – gross tonnage	2017	1,407	1,571,784	0.1%
	Number of persons employed in fishing and aquaculture	2016	2,000	181,820	1.1%
	Total catches in thous. tonnes live weight	2017	9.6	5,145.6 c	0.1%
	Total aquaculture production (volume) in thous. tonnes live weight	2016	12.6	1,259.8 c	0.9%
	Total aquaculture production (value) in million EUR	2016	35.7	4,128 c	0.5%

^a EU-28 average values; ^b in 2016; ^c in 2015.

Source: Own calculations and elaboration based on Eurostat 2018.

The number of farms in Romania is huge in both absolute and relative terms, compared to all farms throughout the European Union. There are over 3.42 million farms in Romania. They make up nearly 33% of all farms in the EU. The utilised agricultural area in an average farm in Romania was 3.6 ha in 2016 (and 3.6 ha in 2013), while the EU-28 average exceeded 16.5 ha. However, when the legal form of farms is taken into account, the situation for utilised area varies. Small farms without legal personality have an average area of 2 ha, while farms with legal personality manage an area of over 213 ha. It is also worth noting that arable land grows much faster on large farms than on small ones. Between 2013 and 2016 arable land on large grew over 6 ha (3%), while on small farms it grew by only 0.02 ha (1%) [National Institute of Statistics 2017].

The number of people employed in agriculture in Romania is 2 million, while in the whole EU it is slightly more than 9.7 million. This means that Romania's share is close to 20%. The percentage of people employed in agriculture in Romania is 23%, while in the EU overall it is around 4.2% and even lower in rich and highly developed countries (e.g. Belgium, Germany, United Kingdom, and Denmark). The percentage, of course, is higher in less developed EU countries (including Bulgaria, Poland, Greece, and Portugal). It should be noted that in 2000, 45% of the workers in Romania were employed in agriculture, and in

2006 it was about 30.5%. This suggests a positive change in agriculture, with workers moving to other branches of the national economy and contributing to its development [The World Bank 2019b]. Romania's share of agriculture in GDP is relatively high compared to the EU (as an average) and to other EU countries; in 2017 it was 4.1%. However, there has been a downward tendency – in 2000 the share reached 11%, but in 2006 it was around 8% and it is gradually decreasing [The World Bank 2019a].

The decline in the contribution of agriculture to GDP does not mean a decrease in the value added generated by this sector. This proves that other branches of the economy (industry and services) are increasing their shares in the GDP. It is worth emphasising that in agriculture one can observe other positive changes, including a 13% increase in labour productivity (in income per annual work unit) between 2016 and 2017 which is a long term the tendency [Eurostat 2018]. The value of production in the agricultural sector in Romania in 2017 was close to EUR 16 million, with crop production accounting for nearly over 74% (EUR 11.9 million), and the value of animal production was less than 26% and EUR 4.1 million. The difference in this structure is much smaller for the EU as a whole.

Based on the data in Table 1, several indicators can be calculated to characterise the average farm in Romania (against the background of the EU). On average there is 0.6 person working on each farm in Romania (in EU-28 this value reached 0.93). This happens because of the very large number of farms. Employment (in persons per hectare) in Romania is close to 0.16 (of people working in the sector), while in the EU-28 it is 0.056. That is Romanian agriculture is almost three times more labour-intensive per hectare, which results from high employment in Romanian agriculture. Romania's agricultural output (production value at basic prices) calculated per hectare of utilised agricultural area (i.e. land productivity) is EUR 1,398 (against EUR 2,501 in the EU). The calculation per farm is EUR 5,108 (EUR 41,327 in the EU), and the calculation per person employed in agriculture (labour productivity) is EUR 8,917 (while in the EU it exceeds EUR 44,503). The data from Table 1 and these indicators once again clearly emphasise that Romania has lower productivity in agriculture than the average for the European Union. This is largely because of the presence of small and significantly fragmented farms.

3.3. What is a Romanian small farm?

Romania has a long tradition in family farming. The farm represents the pillar on which the Romanian society developed. Family farm activities are not limited to agriculture. They also comprise important social activities for the community and family, preserve traditions and crafts, attract rural tourism and agritourism, and help to protect the environment through extensive agricultural practices. The traditional farmhouses and courtyards are gathered into villages. Crops are grown on the arable valley floors, and the valley slopes are given over to hay meadows and large expanses of communal grazing land for both sheep and cattle. The typical family farm consists of a farmhouse; barns; sheds for cattle, sheep, pigs, chickens and hay; a vegetable patch for household use, and an apple, plum, and pear orchard.

According to Page and Popa [2013], the large number of small-scale holdings is an important source of economic, cultural, social, and natural strength for Romania. However, Otiman [2013] argues that there is a correlation between the existence of very large farms (over 2,000 ha) in certain areas and severe rural poverty and hunger. He points out that in the poorest regions in Romania there are often many large farms, while small farms are located in the northern and central parts of Romania – in these regions people do not suffer as much because of hunger. This may be because small farms can produce agricultural products and food for their own consumption. Thus they strengthen and ensure food security, which reduces the scale of malnutrition.

Romania's agriculture particularises through a great number of small agricultural farms practising subsistence agriculture, in which the agricultural production is planned for the farmer's own consumption first. Family farmland is usually divided into small parcels of arable land and hay meadow, often only 0.3 hectare in size, near the village. Further from the village are the common grazing pastures and forests. The small-scale farms, strongly associated with family farming, are still under increasing pressure because of the loss of economic viability and their inability to provide adequate living conditions for (young) farmers.

Depending on the economic scale, the farms and agricultural holdings are classified as follows [Bortis 2015]:

- below 1,999 EUR: subsistence farms that produce entirely for the farmer's own consumption;
- 2,000–7,999 EUR: semi-subsistence farms that ensure their own consumption and sell a small part of their agricultural production;
- 8,000–49,999 EUR: small commercial farms that sell more than 50% of their agricultural production;
- 50,000–999,999 EUR: commercial farms/medium agricultural holdings that sell their entire agricultural production;
- over 1,000,000 EUR: commercial farms/large agricultural holdings that sell their entire agricultural production.

There are some additional criteria that define a small farm. The following are data for the European Union and Romania in 2016 [Eurostat 2017]:

- area of land: in the EU they are less than 5 ha and fewer than 10 million farms; in Romania: there are more than 3 million farms, which is about 92% of all Romanian farms;
- standard output: in the EU there are about 10 million farms with SO below EUR 8,000; in Romania: there are almost 3.2 million farms (about 94% of all farms) with SO below EUR 8,000 and 115 thous. farms (3.34%) with SO between EUR 8,000 and EUR 15,000;
- labour input (AWU,¹ FWU²): – determination of the threshold value, for example, 1 or 2 AWU;
- market share (level of self-supply): ‘semi-subsistence farm’ where less than 50% of the agricultural production is sold and the rest is consumed in the household (in Romania there are more than 2.9 million farms (81% of all farms) with a standard output of EUR 0–15 thous.).

For many years the economic potential of both the farms and the labour force from the subsistence farms were exploited not sufficiently. This diminished the farming output and made Romania a net importer of farm products [Burja and Burja 2008;

¹ Annual work unit (AWU) is the full-time equivalent employment, i.e. the total hours worked divided by the average annual hours worked in full-time jobs in the country. One annual work unit corresponds to the work performed by one person who is occupied on an agricultural holding on a full-time basis [Eurostat 2019].

² Family Work Unit (FWU) concerns own (family) labour input, it could be identified with one full-time employee of the family in the farm [Wrzaszcz 2016; Mikołajczyk and Zmarzłowski 2008].

Burja and Burja 2014; Burja, Moraru and Rusu 2008; Neculai 2012; Săvoiu, Manea and Manea 2007]. The situation in Romanian agriculture is changing, however, thanks to an increase in labour productivity and the slow process of improving the agriculture area structure (increasing arable land in farms). However, many actions must be taken to speed up positive changes in this sector.

3.4. Small farms dataset

In Romania there is a problem of excessive fragmentation of the agrarian structure. This happens in other countries, although not to such a scale. That is, there are a lot of small farms (with low economic strength and low area), which occupy a small area of arable land. The right side of Figure 1 shows that very small farms (with a standard output below EUR 8,000 per year) make up nearly 95% of all farms in Romania, but manage only 38% of the utilised agricultural area. Medium-sized farms (standard output of EUR 8,000–249,999) make up 5.3% of all farms and occupy over 32% of arable land, while large farms (with standard output of EUR 250,000 and more) in the structure make up only 0.1% but occupy nearly 30% utilised agricultural area.

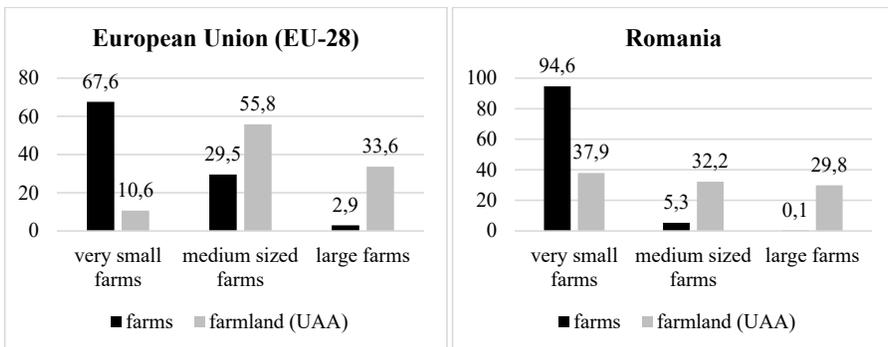


Figure 1. Farms and farmland by farm size in standard output in the European Union (EU-28) and Romania in 2016 (% share of national totals)

Very small farms: less than EUR 8,000; medium-sized farms: EUR 8,000 to EUR 249,999; large farms: EUR 250,000 or more.

Source: Eurostat 2018.

As indicated, other European Union countries have also fragmented agrarian structure (e.g. Poland, Italy, Bulgaria, and Greece). When one takes into account that in the EU-28, 67.6% of very small farms are using 10.6% of the total utilised agricultural area. Medium-sized farms are dominant in the European agriculture – their share of farms is 29.5% and they are using 55.8% of total arable land, while large farms (2.9% of all farms) are using 33.6% of total farmland, what is depicted in Figure 1.

In Romania, it is common for a farm to use its own work, i.e. when it accounts for over 50% of the total labour input on the farm. In 2016, there were about 99.3% of such farms. Therefore a very few farms (about 23 thous.) used hired labour (more than 50% of the total labour input on the farm). Those farms operated more as enterprises than as small farms functioning at the household level and producing mainly for internal needs. In 2016, a significant number of farms in the EU as a whole also used their own labour resources. This confirms that EU agriculture is based on small and medium-sized farms. However, in the EU, the share of farms using more than 50% of labour from family members was lower than in Romania and amounted to 94.7% [Eurostat 2018].

Table 2. Agricultural farms in Romania by the legal status in 2016

Specification	Agricultural holdings without legal personality	Agricultural holdings with legal personality	Total
Agricultural holdings with utilised agricultural area and livestock	2,486,736	2,723	2,489,459
Agricultural holdings with only utilised agricultural area	829,799	22,927	852,726
Agricultural holdings with only livestock	79,389	429	79,818
Total agricultural holdings	3,395,924	26,079	3,422,003

Source: National Institute of Statistics 2017.

According to the data published by the National Institute of Statistics through the Farm structure survey, the number of agricultural holdings in 2016 was 3.42 million (see Table 2). This was 5.7% less than in 2013 and 11.3% less than in 2010. The number of agricultural holdings without legal personality was almost 3.4 million (5.7% lower than in 2013). Such individual farms and family companies are rare (about 0.5% of all farms without legal personality). The number of agricultural holdings with legal personality was over 26 thousand (6.4% lower than in 2013) and it is worth mentioning that only 0.76% of Romanian holdings have legal personality. This group includes most common commercial companies with private majority capital (about 50% of all) and other types like foundations, religious units, and schools (about 32%). Commercial companies with state majority capital and co-operative units are a minority. Agricultural holdings without legal personality are dominant in the farms with a small utilised agricultural area (less than 50 ha). In the farms with more area (50–100 ha), agricultural holdings without legal personality are 70% of all farms. When one considers the biggest farms (over 100 ha) most of them (more than 75%) are holdings with legal personality [National Institute of Statistics 2017]. Farms with small areas often are functioning parallel with households, thus they are just small individual units.

Table 3. Use of agricultural products in farms by size – number of farms and utilised area (in thous. ha)

Size of farm (ha)	Own consumption, more than 50%		Sale, more than 50%	
	Number of farms	Utilised agricultural area (in thous. ha)	Number of farms	Utilised agricultural area (in thous. ha)
Below 0.1	409,342	17.4	11,666	0.5
0.1–0.3	515,226	92.3	25,536	4.8
0.3–0.5	272,081	105.4	15,836	6.1
0.5–1	519,827	372.4	34,635	25.0
1–2	560,145	798.0	51,422	75.6
2–5	539,531	1,652.8	93,419	307.7

Size of farm (ha)	Own consumption, more than 50%		Sale, more than 50%	
	Number of farms	Utilised agricultural area (in thous. ha)	Number of farms	Utilised agricultural area (in thous. ha)
5–10	123,460	816.4	53,718	370.3
10–20	15,157	191.6	21,230	288.2
20–30	1,154	26.7	6,012	144.3
30–50	353	12.9	4,481	172.7
50–100	101	6.6	3,277	226.9
100 and more	6	1.0	4,280	1,692.7
Total	2,956,383	1,093.5	325,512	3,314.8

Data refer only to agricultural holdings without legal personality.
Agricultural holdings without utilised agricultural area are included.

Source: Own elaboration based on the National Institute of Statistics 2017.

Table 3 presents data on farms without legal personality, divided into farms that consume more than 50% of what they produce and farms that sell directly more than 50% of what they produce. For each group the number of farms and utilised agricultural area in thous. ha are indicated. According to the farm structure survey, for Romanian agriculture in 2016, there was a clear disproportion between these values for farms producing mainly for their own consumption and farms mostly selling products on the market. In Romania, there were nearly 3 million farms producing for their own needs (over 90% of all, according to this nomenclature), and they covered close to 4.1 million hectares (ha), so the average area of such farms was 1.4 ha. In turn, there were only one-ninth as many farms that were more strongly connected with the market. They amounted to 325.5 thous. ha and occupied an area exceeding 3.3 million ha, so the average farm in this category was more than 10.2 ha. The most numerous farms producing for their own consumption were entities of 1–2 ha (over 560 thous.), 2–5 ha (almost 540 thous.), and 0.5–1 ha (almost 520 thous.). Together they occupied 800 thous. ha, 1.6 million ha, and 370 thous. ha, respectively. It is worth noting that a very large group were very small farms, with an area not exceeding 0.1 ha. There were almost 410 thou-

and such farms, however, they used an area slightly more than 17.4 thousand. ha. On the other hand, in terms of the number of farms, market-related farms, with an area of 2–5 ha (over 93 thous.) dominated. In terms of total occupied area, farms greater than 100 ha (4280 farms) dominated, as depicted in Table 3.

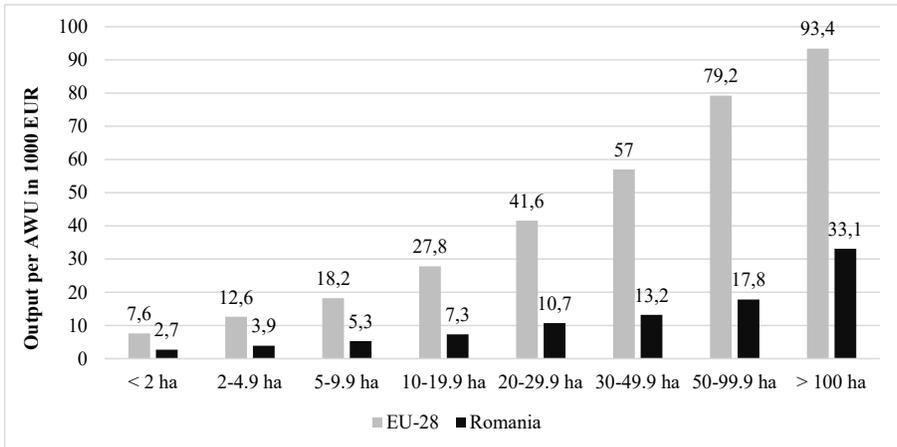


Figure 2. Agricultural output per annual work unit (AWU in 1,000 EUR) and farm size (ha) in 2013

Source: Own elaboration based on Tebald and Gobjila 2018.

Figure 2 presents labour productivity as agricultural output per annual work unit in farms with different utilised areas in the European Union and Romania in 2013. Fragmentation and the small size of farms can contribute to low productivity. This Figure shows that farm size has a major influence on agricultural labour productivity in EU (average value in the EU). The bigger the farm (taking into account the utilised agricultural area), the higher the labour productivity, because large farms can achieve economies of scale. In the EU in 2013 large farms (more than 100 ha) achieved output per AWU 12 times as high as farms of less than 2 ha. The biggest entities achieved EUR 93.4 thous. while small farms: EUR 7.6 thous. In Romania, by contrast, agricultural output per AWU was EUR 2,700 in farms of less than 2 ha, compared with EUR 17.8 thous. in farms of 50 to 99 ha and more than EUR 33 thous. in farms over 100 ha. Thus, the differences are quite similar

to those in the EU. It is important to point out that agricultural output per AWU in Romania was much smaller than in the EU. On average, it was only 28% as much, but it was only 22% as much as for farms with an area of 50–99.9 ha.

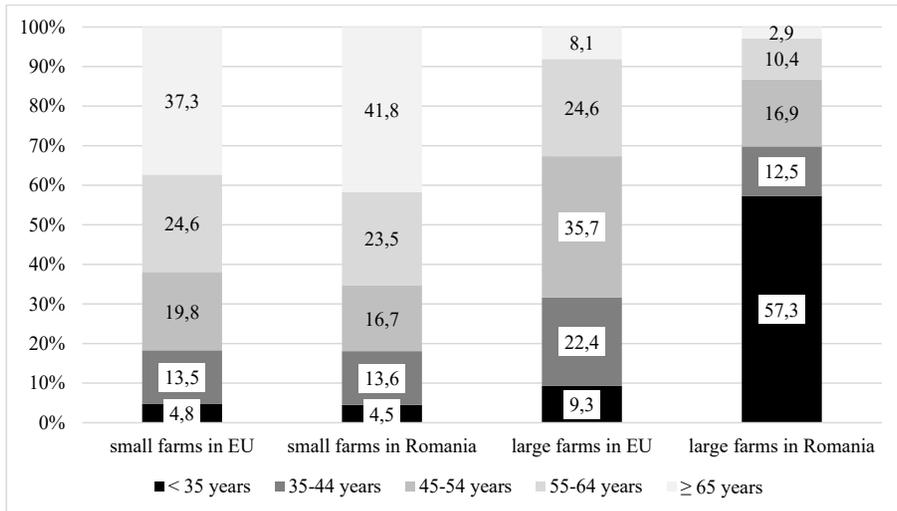


Figure 3. Structure of the age of farm managers by farm size (in economic terms) in 2013 in %

Small farms: less than EUR 8,000 standard output; large farms: EUR 100,000 or more.

Source: Own elaboration based on Tebaldi and Gobjila 2018.

Figure 3 presents the age of farm managers in the European Union and Romania in 2013 with a distinction between small and large farms, defined in the economic sense. There are some similarities between a manager's age in small farms in the EU and Romania. Farmers under 35 are only 4.8% and 4.5% of all managers, respectively. The situation is similar in the 35–44 and 55–64 age groups. The feature of small farms (of low economic strength) is the high share of older managers. This is because running a small farm (semi-subsistence) is not an attractive profession for young people. Hence the manager's age is on average much higher than for large farms. By contrast, it may be an interesting place to work and earn an income for young people, so the share of young farmers (under 35) is very high in Romania (as much as 57.3% of all managers). For these reasons,

the share of older farmers is relatively low, and in the oldest group is represented by less than 3% of all managers. In the EU, the age distribution in large farms is more even: managers who are 45–54 (share of 35.7%) dominate, followed by managers who are 55–64 (24.6%) and 35–44 (22.4%). The high share of young farmers on large farms can be considered a positive phenomenon. It is because young managers (despite less professional experience) have a longer-range perspective of running a farm and often have more professional training and higher levels of educational attainment (this includes agricultural professions, although this is not the case in Romania). Moreover, young farmers are usually more willing to implement modern farming practices and innovations, to invest and potentially to have a better chance of obtaining high revenues and incomes, which might equal the incomes achieved in other sectors of the national economy. The ageing of farm populations will probably lead to a major shift in farm ownership and management soon, and it will redefine the farm structure in Romania. It is estimated that about 75% of the utilised agricultural area will be transferred to new generations during the next 15–20 years. This change can contribute to land consolidation and growing productivity in agriculture, which could create conditions for an increase of numbers of commercially viable farms [Tebaldi and Gobjila 2018].

3.5. Agricultural policy for small farms

The National Programme for Rural Development for the period 2014–2020 aims to sustainably and intelligently support the economic and social development of rural areas in Romania. There is a stringent need to improve environmental conditions and to promote sustainable practices – both in agriculture (including small farms) and in the economy in general. The land of high natural value, which accounts for approximately 16% of the total agricultural and forest land, is an important factor for biodiversity. There is a strong correlation between the need to promote biodiversity and forestation and the need for local training and consultancy to promote good practices in agriculture and forestry with regard to landscape and ecosystem management. These are relatively new concepts in Romania, but there is potential for these ideas to be adopted by farmers and foresters. The need for sustainable businesses, jobs, communities, and ecosystems also requires better protection of water and soil resources and of

integrated management systems. Primary support must be given to specialised preparation and consultancy, especially for high-risk areas, and to the attainment of water quality standards and protection of soil resources to adapt to climate change. Actions are also needed to support the ‘accelerated’ adaptation of farmers, processors, and rural communities to climate change by improving the sustainable management of water and soil protection. This will be supported through knowledge transfer, innovation stimulation, and application of the results of research to the real needs of the sector.

To ensure their viability, Romania’s farms, since most of them are small, should receive support tools. It has been seen that by supporting family farms, social problems related to unemployment can be solved. Moreover, it is possible to increase the connections between people working in agricultural production and the domestic market by increasing the share of farms that sell their products, not only producing for their own consumption. If Romanian farms could standardise their production, they could sell some agricultural and food products on the European and world market. This could help Romanian farms improve their economic outputs, increase productivity in agriculture, and raise the incomes of farmers. It is important to diversify production to ensure revenue all year. The Romanian Government identified three priorities for improved support for family farms: (1) promoting the family farm as a sustainable and inclusive growth model; (2) creating an institutional framework to implement support measures; and (3) including family farms in the food supply chain [Food and Agriculture Organization of the United Nations].

According to Eurostat, the total number of common agricultural policy (CAP) income support beneficiaries in 2016 was 844,480 (75.3% farms were not benefiting); the average CAP income support per beneficiary in Romania was EUR 2,270, while the EU average was EUR 6,530. There were differences also in the CAP support per hectare – in Romania, the payment was EUR 221 and the average value in the EU was EUR 259 [European Commission 2018].

Direct payments are granted to farmers in the form of basic income support related to the number of ha farmed. This so-called ‘basic payment’ is complemented by a series of other support schemes targeting specific objectives or types of farmers [European Commission 2017]:

- a ‘green’ direct payment for agricultural practices beneficial for the climate and the environment;

- a payment to young farmers;
- (where applied) a redistributive payment to provide improved support to small and middle-sized farms;
- (where applied) payments for areas with natural constraints, where farming conditions are particularly difficult, such as mountain areas;
- (where applied) a small farmers scheme, a simplified scheme for small farmers replacing the other schemes;
- (where applied) voluntary support coupled to production to help certain sectors undergoing difficulties.

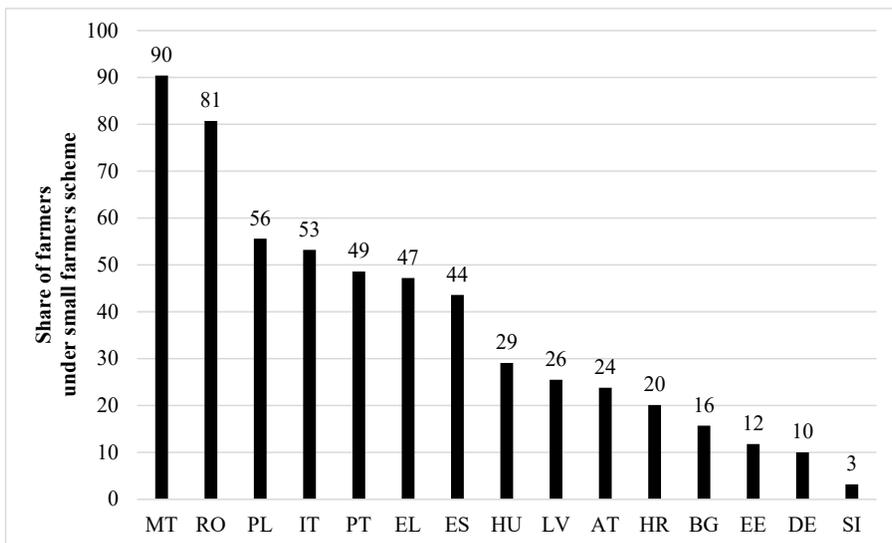


Figure 4. Share of farmers under the small farmers (in %) scheme (SFS) in the total number of farmers eligible for direct payments

AT – Austria, BG – Bulgaria, DE – Germany, EE – Estonia, EL – Greece, ES – Spain, HR – Croatia, HU – Hungary, IT – Italy, LV – Latvia, MT – Malta, PL – Poland, PT – Portugal, RO – Romania, SI – Slovenia.

Source: Own elaboration based on European Commission 2017.

As mentioned, more than 75% of farm holdings in the EU are small – below 10 ha – with a very large majority of them below 5 ha; almost 70% of them had an output below EUR 8,000. To address the specific situation of these farms,

member states can apply the small farmers scheme (SFS), which is a simplified direct payment scheme granting a one-off payment to farmers who participate. The maximum payment is decided at the national level, although it may not exceed EUR 1,250. This scheme is very convenient for farmers. It has simplified administrative procedures, and beneficiaries are exempt from greening and cross-compliance sanctions and controls. The scheme is applied in 15 European Union countries, including six old member states: Austria, Greece, Germany, Italy, Portugal, and Spain and most of the new member states: Bulgaria, Croatia, Estonia, Hungary, Latvia, Malta, Poland, Romania, and Slovenia. In 2015 small farmers scheme represented more than 5% of the expenditure for direct payments in participating countries. However, there are great differences between countries. For example, expenditures range from less than 1% in Bulgaria, Germany and Slovenia to more than 30% in Malta. As shown in Figure 4, the scheme covers more than 90% of beneficiaries in Malta, more than 80% in Romania, and 43–56% in Greece, Italy, Poland, Portugal and Spain. There is a very low share of farmers under SFS in Slovenia (3.2%), Germany (10%), and Estonia (12%) [European Commission 2017; Eurostat 2018].

3.6. Conclusions

The aim of the paper is to present the situation of small farms in Romania to show their characteristics and features, and the problems and challenges they face. Small farms in Romania are usually presented against the background of the European Union (and sometimes of member countries) to show differences in their functioning and the resulting consequences. There is in Romania a large number of small and medium-sized farms, with a low level of inputs used, and they account for over 90% of all farms in the country. However, they are using a relatively small part of the utilised agricultural area, their agricultural land is extremely fragmented and is characterised by a low share of the total standard output achieved by all farms. Furthermore, small farms rarely have legal personality, they operate in parallel with households, so they are using a significant part of their production for their own consumption. Usually, they are subsistence and semi-subsistence farms, producing for their own use, for families, or for local sale. The various problems that small farms face include low productivity,

especially labour productivity and productivity in the livestock sector, ineffective and inappropriate marketing channels for small farms, and small numbers of producer organisations. It should be stressed, however, that thanks to membership in the European Union and the possibility of using the supporting instruments of the common agricultural policy, the situation is improving and some good outcomes are noticeable. There are changes in the structure of agriculture (including agrarian), which is crucial for improving the efficiency of farming, increasing agricultural incomes, and improving the general situation of agriculture and rural areas.

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CHAPTER 4. Small farms in Lithuania

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Abstract

Agriculture and rural areas are important components of the Lithuanian economy, but the agricultural sector is facing important structural challenges in relation to small farms. Although there is a decreasing number of small farms in Lithuania, the number is still relatively high. Small farms contribute to economic, social, cultural, and environmental aspects of Lithuania's economy and sustainable development, but they are unable to compete with large farms. For this reason, namely the importance of small farms, stopping their eradication requires public support. It is visible from agricultural policy that ways of helping small farms to stay on the market are being sought out, which results in the implementation of new instruments to support their viability. The following chapter is devoted to a general picture of small farms in Lithuania, taking into account their place in the agricultural sector, their economic performance, and being the recipient of agricultural policy.

Key words: small farms, Lithuania, agriculture, intervention policy.

JEL codes: Q12, Q18.

4.1. Introduction

Although generally there is a decreasing share of agriculture in GDP and employment as the economy progresses, this does not mean that the role of agricul-

ture in economic development is decreasing. The significance of agriculture is reflected not only in the economic sphere but also in the social, civil, cultural, and environmental aspects of society. Lithuania covers an area of 65,000 km², of which over 85% is rural. Farmland comprises 60% of this area while most of the rest is forestland (32%). Lithuania has a population of approximately 3 million – of which over 33% live in rural areas where about 38% of the total workforce is employed. Therefore, considering the economic, social and environmental aspects, agriculture and rural areas are still important parts of the Lithuanian economy. The Lithuanian agricultural sector is facing important structural challenges, including a low competitiveness of small farms or a polarised farm structure with almost 50% of farms being less than 5 ha in size.

Lithuania, an EU member since 2004, tends to follow the paths of a number of post-socialist countries with regard to the development of farm structure. On the one hand, there is a concentrated land process, and an increase in the number, and economic power of large competitive farms. On the other hand, a decreasing number of small uncompetitive farms can be detrimental to demographic, economic and environmental aspects. Small farms contribute to society in maintaining the density of rural populations, and rural vitality (especially economic) in delivering public goods. Due to changing consumer attitudes towards nutrition and the environment, small farms have developed in the areas of locally sourced food and agritourism. Given the role of small farms in sustainable development, stopping their eradication requires public support. For this reason small farms are included in, and planned for, in the implementation of agricultural policy in Lithuania.

4.2. The Lithuanian agricultural sector – basic information

The value of the gross agricultural output steadily grew between 2013 and 2016, but began declining in 2018. In 2018 the gross agricultural output amounted to EUR 2.36 billion and was 7% lower than in 2013 (see Table 1). Lithuania's gross agricultural output per hectare of utilised agricultural area (UAA) is one of the lowest in the EU, and in 2017 its value was equal to 919 EUR/ha UAA (891

EUR/ha UAA in 2013)¹ [Lithuanian Institute of Agrarian Economics 2018]. At the same time, the gross value added (GVA) created by agriculture increased, although its share of GVA in the Lithuanian economy decreased from 3.9% in 2013 to 2.3% in 2018.

Lithuania is a country where crop output is predominant. During the analysed period, the share of crop output fluctuated between 59% and over 66%.² The highest share of agricultural output consisted of cereals, which were responsible for almost 31.5% in 2018. In the same year, milk accounted for 18.8%, animals and poultry breeding for 15.9%, forage plants for 10.7% and industrial crops for 10.8%. These five groups of products corresponded to almost 88% of gross agricultural output in 2018 (respectively 86% in 2013).

Since 2004, the balance of agricultural and food products in trade was positive [Lithuanian Institute of Agrarian Economics 2018] and the trade in this group of products has made up a substantial part of Lithuania's foreign trade structure (see Table 1). Over the period of 2013–2018, the value of export and import increased. Although the share of exports and imports in agricultural and food products decreased by almost 1.7 p.p., it was still high and reached over 17%, and nearly 13% of Lithuania's total commodity exports and imports. The EU remains the biggest market for Lithuanian agricultural and food export and import. It reached 64.5% and almost 83.8% in 2018, respectively.

Table 1. Macroeconomic indicators in the agricultural and food sector in Lithuania in 2013–2017

Indicators	2013	2014	2015	2016	2017	2018
GVA, EUR mill.	31,690.1	33,067.7	33,716.4	34,957.9	37,916.6	40,528.5
Gross value added created in agriculture, EUR mill.	1,057.8	1,022.3	1,120.7	997.5	1,241.2	917.3

¹ In 2017 a lower value was characteristic for Estonia, Latvia and Bulgaria [Lithuanian Institute of Agrarian Economics 2018].

² It is worthwhile underlining that purchase price for agricultural product as well as input prices influence the value of agricultural production. So, in 2013–2017 the price index tendencies for agricultural products, inputs, crop production and animal production differed [ibidem].

Indicators	2013	2014	2015	2016	2017	2018
Share of agriculture in gross value added, %	3.3	3.1	3.3	2.9	3.3	2.3
Gross agricultural output, EUR mill.	2,548.7	2,450.9	2,530.4	2,270.0	2,534.6	2,358.4
Crop output, EUR mill.	1,512	1,456.2	1,678.8	1,465.2	1,570.7	1,425.4
Livestock production, EUR mill.	1,036.7	994.7	851.6	804.9	963.9	933
Value of exported agricultural and food products, EUR mill.	4,695.8	4,644.4	4,475.1	4,385.7	4,820.2	4,906.5
Share in total export, %	19.1	19.1	19.5	19.4	18.3	17.4
Value of imported products, EUR mill.	3,722.2	3,705.9	3,585.1	3,408.8	3,758.8	3,879.3
Share in total import, %	14.2	14.3	14.1	13.8	13.2	12.5
Foreign trade balance, EUR mill.	973.6	938.5	890.0	976.8	1,061.4	1,027.3

* At current prices where appropriate

Sources: own elaboration based on data of Lithuanian statistics and EUROSTAT 2019.

Challenges that Lithuania's agricultural sector faces are connected with structural issues. According to the Farm Structures Survey conducted in 2016, there were 150,320 farms in Lithuania.³ In comparison, the number of farms in Lithuania was 252,946 in 2005. This number has been steadily decreasing. Most of Lithuanian farms were, and still are, small in physical or economic nature. While the number of farms is decreasing, the average farm size is increasing. The average size reached 19.6 ha in 2016, meanwhile the average size of an agricultural holding by UAA decreased from 614.7 ha in 2005 to 462.5 ha in 2016.

³ Excluding farms which had less than one hectare of UAA land and from agricultural activity generated revenue of less than EUR 1,520 per year [Statistics Lithuania 2018].

Since joining the EU in 2004, Lithuanian rural population employment rates in the agricultural sector have decreased. Agricultural activity has become only one of many of the main sources of income for the rural population, and accounted for only a quarter of the income of a rural household member over the last decade. A solely family workforce in farms make up more than 23% of the total working-age and older persons in rural areas in 2016. Over 95% of total family farms were family labour-based farms.

4.3. What is a Lithuanian small farm?

The question of the definition of a small farm has not been actively debated in Lithuania over the last decade. The lack of debate could stem from a relatively modest amount of recent literature on the aspects of small farming. It would be more appropriate to state that the debate on the definition of small family farms, as well as on the cut-off thresholds of farm size indicators, occasionally arise between policy makers, government officials, and farmers' associations. The problem with the definition of a small farm has been discussed in the context of the support under both pillars of the CAP, or in the context of legal taxes [Trofimišinas 2007; Jurkėnaitė 2014; Žurauskienė 2017; Tavorienė 2018].

A journalist survey revealed [Trofimišinas 2007] that the Lithuanian Family Farmers' Union, which represents small farms, highlights the problem that the concept of farm size is not defined in the legislation. This situation was qualified as a paradox, because without such a definition, neither farmers nor government officials can have a clear understanding of what a small farm is. In order to avoid a wide range of manipulations, farm size should be clearly categorised. Meanwhile, at the Lithuanian academic level, the question of the small farm definition, when usually discussed, is based on a 'rule of thumb.' In some cases, the size of small farms is generally undetermined, but in others certain physical or economic indicators are used to describe what the 'small farm' is. However, these mentioned indicators are not described in detail and are sometimes viewed as being trivial. For example, with respect to physical size, the thresholds could be 3–10 ha [Ratkevičienė and Kocai 2013], 3–15 ha [Žekonienė 2006], less than 5 ha [Atkočiūnienė et al. 2016], less than 10 ha [Kazakevičius 2010; Zaleckiene

2017] or less than 30 ha [Volkov et al. 2019; EU Direct payments scheme on first hectares].⁴

Taking into consideration the economic size of a farm, the thresholds for small farms also varied. Small farms were described as being less than 4 European Size Unit (ESU) [Melnikienė et al. 2009]; less than EUR 4,000 expressed in Standard Output (SO) [Jurkėnaitė 2014]; less than EUR 25,000 SO [Atkočiūnienė et al. 2016; Jedik and Stalgienė 2018]; from EUR 4,000 SO to EUR 15,000 SO [Veveris and Sapolaite 2017] or less than EUR 8,000 SO [RDP 2014–2020 of Lithuania, Support to small farms measure].

Farm size can be defined using different physical indicators (farmland area, number of animals, number of labour force, etc.) and indicators of economic size (standard output, gross cash farm income or farm's revenue, annual sales or turnover, etc.). Each of these indicators have their pros and cons, widely discussed in the literature [Gioia 2017; Greblikaite, Vanagiene and Ziukaite 2017; Veveris and Sapolaite 2017; Guiomar et al. 2018]. The most popular and precise criterion by which to evaluate the size of rural farms seems to be its economic size, which has been measured by standard output (SO) since 2010. The economic size indicator will be used as the main criterion for the definition of a small farm in Lithuania. The definition of what constitutes an economically small farm in this study is based on the standard output (SO) concept applied in the European Union legislation underlying the FADN and Farm Structure Survey. A cut-off threshold of EUR 25,000 of SO per year is applied to the definition of a small farm in Lithuania. The same cut-off threshold for small farms has been applied in various cases [i.e. Goraj et al. 2010; European Commission 2013; Claros 2014; Vitunskienė 2014; Miceikienė and Čiulevičienė 2016; Veveris and Sapolaite 2017; Dillon, Moran and Donnellan 2017; Ge et al. 2018, EUROSTAT 2018; Central Statistics Office 2019]. In our case, small farms will be classified into two additional classes:

- very small farms, with less than EUR 8,000 of SO
- medium-small farms, from EUR 8,000 to less than EUR 25,000 of SO

Moreover, the criterion of the physical farm size under hectares of the utilised agricultural area (UAA) will also be applied in this analysis, and its cut-off

⁴ Sometimes the number of ha is completed with specification of area, i.e. agricultural, managed, utilised agricultural.

threshold determination based on the analysis of the relationship between the economic and physical size of farms.

4.4. Small farms dataset

The number of small farms and their social dimensions

Over the last decade, the number of small farms in Lithuania has been on a downward trend. According to the Farm Structures Survey (2016), the number of farms with less than 5 ha of UAA declined from 129,920 in 2005 to 75,200 in 2016, and the number of farms from 5 to 19.9 ha of UAA also declined from 102,120 to 52,090 during the same period. This represents an average annual rate of decline of 4.8% and 5.9%, respectively. Over the same period, 2005–2016, the total number of farms declined at an annual rate of 4.6% in Lithuania. The largest decrease in the number of farms was observed in groups of 2–5 ha, 5–10 ha and 10–20 ha, each of these groups shrinking in half.⁵ Nevertheless, these farms' groups are prevailing in the Lithuanian farming structure.

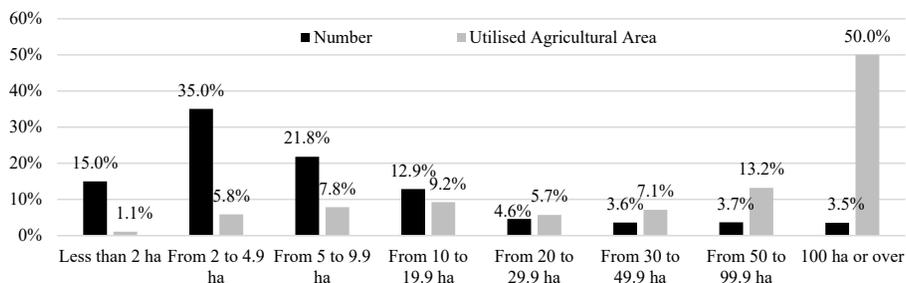


Figure 1. Distribution of farms and land by physical size classes in Lithuania, 2016

Source: own calculations based on EUROSTAT data, 2018.

⁵ It is noteworthy that the number of farms decreased in all farms' size groups in Lithuania except farms with over 50 ha (the number of this category of farms increased in 2016 compared to 2005, from 5,901 to 10,777).

Most farms in Lithuania can be characterised as small in physical terms, since half of farms had less than 5 ha of UAA, while a further one third farmed an area of between 5 and 20 ha. Indeed, there were approximately 75,200 physically very small (less than 5 ha of UAA) and 32,800 physically medium-small (from 5 to 20 ha) farms in Lithuania. The estimated total land area operated by these small farms categories is 701,870 hectares, or 24% of total UAA in the country⁶ (see Figure 1).

Small farms remain a large employer in Lithuanian agriculture.⁷ Based on the Farm Structures Survey data (2016), there were 256,800 people working in all of the country's farms in 2016, and this corresponds to almost 148,400 full-time labour equivalents (called Annual Work Units). People working in very small farms represented 45% of total farmers and family farm workers, and another 34% of the family workforce were working in medium-small farms. Family workers in both of these small farm categories represented over three quarters (79%) of the total family workforce in Lithuania (or approximately 188,000 thousand people). In addition, about 98% of small farms of up to 20 hectares of UAA were family labour-based farms.

Economic size and its interconnections

Similar to their small physical size, most farms in Lithuania are small in economic terms (see Table 2). In 2016, there were nearly 114,200 farms in Lithuania with an SO of less than EUR 8,000, while a further 22,600 farms had an SO within the range EUR 8,000 to EUR 24,999 per year. Together, very small and medium-small farms accounted for more than 91% of all the farms in Lithuania, whereas their share of standard output was considerably lower – slightly more than a quarter (25.9%). Together they cover, just over a third of Lithuania's UAA. The average physical size for economically small farms was 7.4 ha. When looking at the interconnection of economic and physical size, it was found that nearly 93%

⁶ At the other end of the farm physical size scale, only 7.2% of farms had more than 50 ha, but the proportion of utilised agricultural area that they account for is 63.2%.

⁷ Farm's labour force is the broadest category that includes full-time employees and self-employed people, even those that work part-time and provide free labour, which is a common practise for many of the farmer's family members.

of economically small farms cultivated a land area of less than 20 hectares UAA, and 79% farmed and of 10 hectares, and 14% between 10 and 20 hectares UAA (see Table 3). Based on this data, a lower threshold area of 20 ha UAA can be applied to define a small farm in physical terms in Lithuania.

Table 2. Number of Utilised Agricultural Area and Standard Output of economically small farms in Lithuania, 2016

Economically Size based on Standard Output (SO)	Farm number	% of total farms	UAA 1 000 ha	% of total UAA	SO 1 000 €	% of total SO
Very small farms (Less than €8,000)	114,160	75.9%	578.2	19.8%	279,678	12.6%
Medium-small farms (€8,000 – < €25,000)	22,640	15.1%	433.1	14.8%	295,932	13.3%
Total small farms (Less than € 25,000)	136,800	91.0%	1,011.3	34.6%	575,611	25.9%

Source: own calculations based on EUROSTAT data, 2018.

Table 3. Distribution of economically small farms by Utilised Agricultural Area in Lithuania, 2016 (% of farms in different economic size)

Economic size based on Standard Output	Physical size based on UAA									
	Less than 2 ha	2 < 5 ha	5 < 10 ha	10 < 20 ha	20 < 30 ha	30 < 50 ha	500 ha or over	Sum of highest percentages*	Less than 5 ha	Less than 20 ha
Very small farms (Less than €8,000)	19.5	45.2	25.4	8.3	1.2	0.3	0.1	90.1	64.8	98.4
Medium-small farms (€8,000 – < €25,000)	0.8	44.5	16.3	42.8	21.7	11.0	2.8	91.8	5.3	64.3
Total small farms (Less than €25,000)	16.4	38.5	23.9	14.0	4.6	2.1	0.6	92.7	54.9	92.7

*the sum of the highest percentages of farms (see shaded cells) calculated by UAA size classes in each row by economic size classes.

Source: own calculations based on EUROSTAT data, 2018.

On the individual family farm⁸ level, the physical size of the farm in hectares of UAA positively affects the economic size of the farm in euros of SO ($r = 0.844$, $p(0.000)$). In addition, there was a strong positive correlation between both variables ($r = 0.919$, $p(0.000)$). These results coincide with the conclusions of Reidsma, Ewert and Lansink [2007], who indicate that the size of the farm in hectares positively and highly correlates with the economic size of the farm. On the other hand, our study has equally revealed that in the sample of economically small farms, the correlation between the physical and economic size is not as strong ($r = 0.551$, $p(0.000)$) as in the sample of all farms mentioned above. In the case of economically small farms, the coefficient of determination ($r^2 = 0.303$, $p(0.000)$) made it possible to explain only about 30% of the dependence of farm SO on its physical size expressed in UAA. These results support the conclusion that farms of the same size in physical terms can be extremely different economically for various reasons. For example, farm output and income depend on the type of crop grown or animals bred, soil quality, landscape features, climatic conditions, resources available to the farmer, etc. [Davidova and Thomson 2014; Gioia 2017; Guiomar et al. 2018].

Economically small farms in Lithuania are diverse by specialisation (i.e. in terms of what they cultivate or breed) and according to whether or not there is a single dominant activity. Almost 38.3% of all economically small farms in 2016 could be categorised as being crop specialised farms, with a further specialisation in field cropping (32.4% of all economically small farms). One quarter (26%) of economically small farms specialised in livestock farming, 19% in dairy farming, and 35.6% of economically small farms were found to be of mixed production, i.e. a mix of crops, a mix of livestock, or a mix of crops and livestock.

A feature of small farms, especially very small ones, is that they are often subsistence oriented. According to the Farm Structures Survey in 2016, there were

⁸ The data of 1,298 families' farms is used of which 461 farms are classified in the category of economically small farms (the standard output less than EUR 25,000). Data was obtained from Lithuania's FADN database in 2015. In linear regression model $Y_i = f(X_i)$, the explained variable Y_i is economic size of the farm in euros of SO and explaining variables X_i is physical size of the farm in hectares of UAA. The analysis based on two sample i of family farms: a) all family farms; and b) economically small farms whose standard output is less than EUR 25,000.

76,400 farms (45% of the farm population in Lithuania), which consume more than half of the final production. All of these farms are small in economic terms. This means that almost half (49.3%) of economically small farms consumed more than one-half of their production in 2016. Across the whole population of very small farms, 55.4% of farms were classified as semi-subsistent, while just over 18.3% of medium-small farms were subsistence-oriented. Therefore, two distinct groups of small farms distinguished in Lithuania: subsistent and/or semi-subsistence farms and market-oriented farms.

Economic performance

Analysis of the farm income per labour unit shows the significant differences among farms of various economic-size classes in Lithuania. In 2017, the average farm income expressed in farm net value added (FNVA) per annual work unit (AWU) was the lowest in very small farms – at a level of EUR 2,062. This is more than thirteen times lower than in very large farms (EUR 25,000 or over of SO). An even greater income gap between the smallest and largest economy classes of farms was discovered by determining the average family farm income (FFI) expressed per family work unit (FWU), i.e. almost 83 times lower in small farms.

While analysing the distribution of income in economically small farm categories, it is worth underlining that the three-to-five-fold income (expressed in FNVA/AWU and FFI/FWU) gap between the very small farms and medium size farms in FADN seems to have continued in 2017 (see Figure 2). Meanwhile the income gap between medium-small farms and medium-sized farms in FADN remained significantly lower (1.4–1.8-fold). Looking at the trends in farm income measured in FNVA/AWU as well as in FFI/FWU from 2010 to 2017, the average income per labour unit decreased in both categories of economically small farms (see Figure 2). Focusing only on the farm net value added level from 2010 to 2017, FNVA per AWU dropped considerably for very small farms (-27.3%) and to a lesser extent for medium-small farms (-4.4%), while an average of FNVA per labour unit increased in all economic-size classes.⁹

⁹ One of the reasons for income decrease in 2017 was a drought which affected small farms, as these farms do not insure their crops.

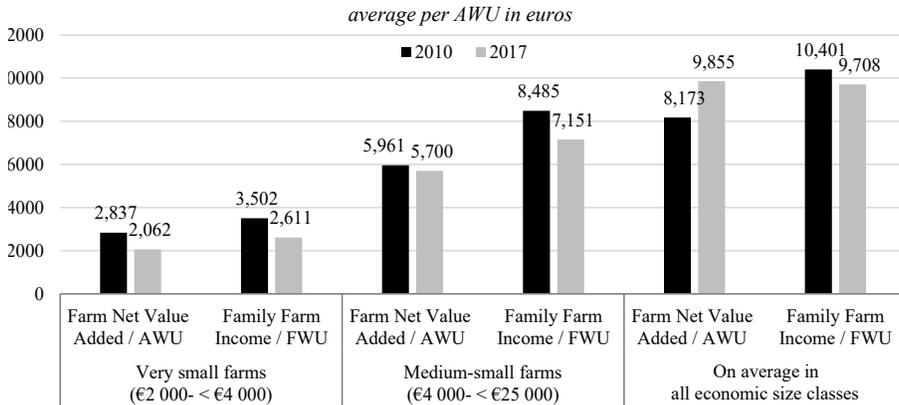


Figure 2. Income in relative terms by economically small farms categories in Lithuania, 2016.

Source: own calculations based on FADN data, 2019.

The economic performance of a farm is influenced by factors such as production resources and farm productivity. Based on the FADN data, the value of the total fixed assets of a farm was on average EUR 34,000 in the very small economic class and EUR 52,400 in the medium-small economic class in 2017. In line with the general trend of asset values in 2010–2017, the growth tendency was observed only in the very small economic class of farms, where the average value of fixed assets increased at an annual rate of 0.9%. Meanwhile, the value of gross investment increased by an average 65% per year. In contrast, the value of both indicators has decreased in the economic medium-small class of farms at an average annual rate of -0.1% and -2.3%, respectively. It should be noted that the very small farm economic class is characterised by higher capital-intensive types of farming, due to the total fixed assets per hectare of UAA being on average 21% higher than the average for all farms covered by the FADN in 2010–2017 (see Table 4).

Table 4. Factors of production in relative terms by economically small farms categories in Lithuania

Specification	Years	Total fixed assets EUR per ha UAA	Gross Investment EUR per ha UAA	Total livestock units per ha	Total labour input AWU	% of paid labour input (SE020)	% of rented UAA
Very small farms (€2,000–8,000)	2010	2,053	158	0.28	1.39	3.6	25.9
	2017	2,035	378	0.23	1.30	1.5	39.2
	2017/2010	99.1	239	82.1	93.5	-2.1	13.3
Compared to on average (in all economic size classes) in 2017		114.7	131.0	89.7	80.7	-17.1	-11.0
Medium-small farms (€8,000–25,000)	2010	1,544	273	0.25	1.57	5.1	45.3
	2017	1,690	256	0.29	1.37	3.6	44.0
	2017/2010	109.4	94	115.8	87.3	-1.4	-1.3
Compared to on average (in all economic size classes) in 2017		95.2	88.5	110.5	85.1	-15.0	-18.7
On average in all economic size classes	2010	1,552	234	0.28	1.83	23.0	57.6
	2017	1,775	289	0.26	1.61	18.6	49.2
	2017/2010	114.4	124	93.8	88.0	-4.3	-8.4

Source: own calculations based on FADN data, 2019.

The average size of UAA in very small and medium-sized economic classes covered by the 2017 FADN survey was 16.7 and 31 hectares, respectively. Rented land accounted for 39% of the total agricultural area in the very small farm class and 44% in the medium-small farm class. Looking at the medium-term trends (2010–2017), the proportion of rented land has increased in the very small economic class but slightly decreased in the medium-sized economic classes. Considering the labour force of 2017, the average number of workers employed in very small farms was 1.3 AWUs expressed in full-time equivalent worker. This was slightly higher (1.37 AWUs) in medium-small farms. As mentioned above,

the bulk of the workforce in small farms consists of family members. In contrast, it is typical for hired work to be very limited (see Table 4).

Relating to the average characteristics of farm productivity, it can be said that average labour productivity (calculated as the farm gross value-added divided by the AWU) in all farms covered by the FADN reached 15,300 EUR/AWU in 2017 (see Table 5). The differences among the economic size classes are substantial, i.e. the higher the economic class of farms, the higher the average labour productivity. The labour productivity is particularly low in the very small farms at level of 4,762 EUR/AWU in 2017 and the distance from the average is evident, i.e. two-thirds less. Meanwhile, in the economically medium-small farm class, this gap is smaller, but still significant (approximately one third). On the other side of the spectrum, the large economic class (from EUR 100,000 to 500,000 of SO) of farms had a productivity average of 42,357 EUR/AWU in the same year.

Table 5. Productivity by economically small farms categories in Lithuania

Specification	Years	Farm Gross Value-Added EUR /AWU	Total crops output EUR / ha	Total livestock output EUR / LU	Total output / / Total input
Very small farms (€2,000–8,000)	2010	4,473	302.1	793.2	1.1
	2017	4,762	294.5	761.6	0.82
	2017/2010	106.5	97.5	96.0	74.5
Compared to on average (in all economic size classes) in 2017		31.0	54.5	72.2	80.4
Medium-small farms (€8,000–25,000)	2010	8,516	293.4	867.7	1.12
	2017	10,028	262.4	756.4	0.9
	2017/2010	117.8	90.1	87.2	74.5
Compared to on average (in all economic size classes) in 2017		65.2	49.0	71.7	88.2

Specification	Years	Farm Gross Value-Added EUR /AWU	Total crops output EUR / ha	Total livestock output EUR / LU	Total output / / Total input
On average in the all economic size classes	2010	11,599	427.5	968.7	1.09
	2017	15,378	539.8	1 054.3	1.02
	2017/2010	132.6	126.3	108.8	86.4

Source: own calculations based on FADN data 2019.

As to total crops output per hectare, the figures revealed a very low average productivity in both small farm's categories, i.e. at level of 294.5 EUR/ha in very small farms and 262.4 EUR/ha in medium-small farms in 2017. This is almost 50% less than the average for all economic size classes. Meanwhile, data on total livestock output per livestock unit (LU) showed a more limited variety of productivity in livestock. The same conclusion can be made when taking into consideration the total factor productivity indicator expressed in the ratio between total output and total input. Finally, it should be noted that all analysed indicators (except FGVA/AWU) showed that productivity decreased in both analysed categories of economically small farms over the last medium-term period (2010–2017).

4.5. Agricultural policy towards small farms

Business uncertainties and the environmental impact of farming justify the significant role that the public sector plays in the protection of farmers in Lithuania. The Common Agricultural Policy (CAP) takes action with income support, rural development, and market measures.¹⁰

¹⁰ According to the data of the survey conducted by UAB, 'Ekonominės konsultacijos ir tyrimai' [EKT 2013], analysing three major types of support: Lithuanian Rural Development Program 2007–2013 (RDP 2007–2013), Direct Payments, and Market Regulation Measures, direct payments were considered to have the greatest impact on the development of the sector. Direct payments got 4.16 points from the maximum 5 available, RDP 2007–2013 got 4.06, and the market regulation measures have been identified as having the least impact on the development of the sector, with a total of 2.5.

Income support measures

The main income support measures are direct payments granted to agricultural activity entities for the declared utilised agricultural area, crops, and animals.¹¹ Economic indicators, representing farming results in Lithuania (concerning the period of 2004–2016) showed that direct payments play a crucial role in maintaining farm income (see Figure 3). Direct payments have a major impact on the incomes of small and very small farms. Due to direct payments, small farms' incomes from market earnings increased from 2.8 to 4.8 times the usual amount, and those of very small farms from 2.3 to 3.6 in separate years after Lithuania's accession to the EU. Direct payments reduced the income gap between the smallest and largest economic size classes of farms [Vitunskienė 2014]. Direct payments and investment subsidies have had the greatest impact on investment in small farms, whereas this impact on large farms can be considered insignificant. Investment support is particularly important for semi-subsistence farms, which make up almost two thirds of farms in Lithuania. It can be concluded from this that the need for investment support is much higher in small and medium-sized farms than in large ones [Vitunskienė and Jazepčikas 2016]. Plant growing has become economically more attractive than animal husbandry in Lithuania because of the decoupling of direct payments from production [Melnikienė and Volkov 2013].

In order to redistribute support to smaller farmers, member states may allocate up to 30% of their national budget to a redistributive payment for the first eligible hectares.¹² The amount of the top-up payment per hectare varies from

¹¹ Direct payments in Lithuania have been paid from the European Agricultural Guarantee Fund (EAGF) and from the national budget by granting transitional national aid (TNA) payments. For example, the share of EAGF funds, allocated for Lithuania's direct payments, in 2017 accounted for 90.9% (EUR 467.1 million) of the total direct payments of Lithuania; the disbursed amount made EUR 453.8 million [Volkov and Sapolaite 2018].

¹² The number of hectares for which this payment can be allocated is limited to a threshold set by national authorities (30 hectares or the average farm size in member states if the latter is more than 30 hectares). The amount per hectare is the same for all farmers in the country where it is applied, and cannot exceed 65% of the average payment per hectare. Ten member states have decided to opt for the redistributive

country to country. For Lithuania in 2017, the payments were as follows: basic payment – EUR 62.78 per ha; first hectare payment for the first 30 ha – EUR 56.25 per ha; payment to young farmers for the first 90 ha – EUR 45.82 per ha; greening payment – EUR 49.22 per ha; coupled payment for protein crops – EUR 41.99 per ha; coupled payment for cereal seed sown under certified seed – EUR 17.86 per ha, and coupled payment for sugar beet growing – EUR 81.17 per ha. If the applicant’s total basic benefits (first hectare payments, young farmer benefits, greening, coupled livestock, and area payments) exceeded EUR 2,000, then a reduction of 1.4% was applied.

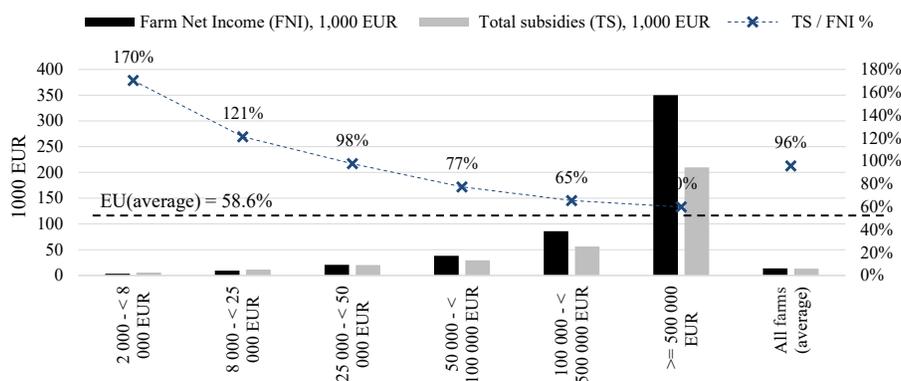


Figure 3. Farm net income and subsidies by farm economic size classes on average in Lithuania, 2017

Source: own calculations based on FADN data, 2019.

SAPS Member States may decide to grant transitional national aid (TNA) for any of the years in the 2015–2020 period. TNA is aimed at providing a complementary income support, with national funding, to farmers in specific sectors, who benefited from the TNA or complementary national direct payments until 2014 pursuant to Regulation (EC) No 73/2009. Lithuania (along with Hungary and Poland) has notified its decision to apply TNA during the entire period. The

payment (Belgium – Wallonia only, Bulgaria, Germany, France, Croatia, Lithuania, Poland, Romania, United Kingdom – Wales only, plus Portugal from 2017).

national aid funds in Lithuania were allocated for the direct support of farms involved in trending towards both crop production and animal husbandry.

Rural development measures

According to the literature study, it can be emphasised that there are four measures related to agriculture activities, and important to small farms, in the 2014–2020 Rural Development Plan of Lithuania (RDP 2014–2020). They are: (a) ‘Investments into agricultural holdings’ (Support for investments); (b) ‘Setting up of young farmers’ (Young farmers); (c) ‘Support for small farms’ and (d) ‘Payments to farmers in areas with natural or other specific handicaps’ (LFA payments) that is divided into: (i) payments to farmers in areas with heavy natural handicaps and (ii) payments to farmers in areas with specific handicaps.

During 2014–2019, the maximum distribution of support is visible through the LFA payments measure, while the maximum support amounts have been paid through the Support for investments (see Table 6). It should be noted that most beneficiaries of LFA payments are small farms, i.e. farms of up to 10 ha account for more than two-thirds of all farms in the LFA (see Figure 4). In this context, support for small farms is insignificant in comparison with other support measures due to its small number of beneficiaries. There is a need for a detailed analysis of why this support measure is not so popular among small farms. Could it be that the requirements are too high, or that small farms are reluctant to commit to the development of the farm meaning that subsequent investments are lacking? Further analysis is required to distinguish the extent to which individual financial support instruments have had an impact on small farms. This detailed analysis requires data from the National Paying Agency, as the general statistics do not specify beneficiaries.

The Lithuanian Family Farmers’ Union encourages government officials to prioritise the Rural Development Programme in such a way that small farms could make easier use of support, which will enable strengthening such farms and allow for their growth to a medium-sized farm. However, free market representatives name the negative consequences of categorising farms according to size. They stress that the size of an enterprise or a farm is not, by itself, positive or negative. This is due to the contested soundness of the decision to organise

an economic activity based on the necessity of large-scale investments for large-scale agricultural areas. Such decisions should not be the basis for differentiating tax benefits. Opposition government officials also point out that, although the measures of the Rural Development Programme focus on farms of different sizes, support to agricultural entities are distributed according to their activity and justification for funding needs, not according to farm size. It is therefore questionable whether it makes sense to classify farms into size categories and to define them in legal acts.

Table 6. Approved amount of support by measures related to small farming in RDP plan 2014–2020 in Lithuania, mill. EUR

Measures	2014		2015		2016		2017		2018		2019**	
	Units*	Sum**	Units	Sum	Units	Sum	Units	Sum	Units	Sum	Units	Sum
Support for investments ^p	64	22.9	1,103	131.9	1,541	96.1	726	27.7	246	40.9	1,257	52.5
Young farmers ^p	0	0	538	29.4	177	6.4	263	9.6	0	0	0	0
Support for small farms ^f	0	0	248	3.7	1,808	10.0	463	0.7	1,113	7.0	570	8.5
LFA payments ^p	71,526	52.9	74,224	53.0	74,081	64.1	70,994	64.3	73,236	44.9	0	0

* number of approved applications/signed contract units; ^p = partially related to small farms; ^f = fully related to small farms;

** the number of applications and the amount of support requested up to 31 May 2019.

Source: own elaboration based on data of National Paying Agency.

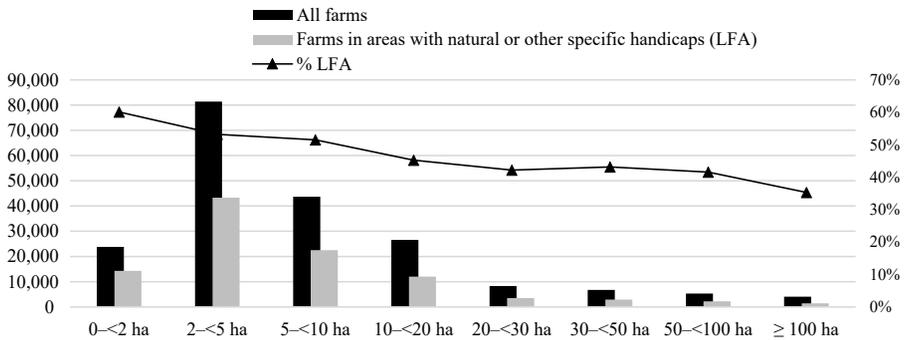


Figure 4. Total farms and farms in areas with natural or other specific handicaps, 2010.

Sources: own elaboration based on data of Lithuanian statistics.

Market regulation measures

In order to protect the market balance of agricultural and food products, and to assure the income for manufacturers, every year different market regulation measures are being implemented in Lithuania. These kinds of measures are not specifically oriented to small farms. However, these measures can be seen as indirect support measures that contribute to risk management in the agricultural sector. Given that small farms do not have sufficient resources to finance risk management tools, these measures can be ancillary to direct support for agriculture.¹³

The basic measures cover intervention purchase, storage and sale of grain, butter, skimmed milk powder, and beef from intervention warehouses. The market regulation measures also cover support being granted for the private storage of cheeses, butter, skimmed milk powder, white sugar, beef, pig meat, mutton, and goat meat; for the use of sugar in the production of industrial

¹³ Availability of funds spent on market regulation measures varies year by year depending on the market situation. In 2013–2017, almost EUR 10.8 million, EUR 5.2 million, EUR 32.2 million, EUR 18.5 and EUR 7.7 million was spent, respectively, with EU funds. In the same period, almost EUR 7.9 million, EUR 11.9 million, EUR 33 million, 38.5 million, and EUR 7.2 million was spent with national funds (Data of National Paying Agency).

products; for fresh fruit and vegetables withdrawn from the market; for the non-harvesting of fruits and vegetables, and for green harvesting. Aid is granted for the consumption of milk and dairy products in educational establishments, and for implementing the programme for the promotion of fruit consumption at schools, etc.

Since 2014, upon assurance of the withdrawal of export subsidy forms (direct export subsidies, export credits, etc.) in Lithuania, other market regulation measures have been promoted. These include supporting trademarks and using electronic communication to popularise regional products and the export of products manufactured by Lithuanian companies (by presenting products of Lithuanian origin at international exhibitions).

4.6. Conclusions

To sum up the above considerations, it should be stated that there is no clear definition of small farms in scientific literature as well as in the legislation of the EU and Lithuania. The expressed values of a small farm size vary from 3 to 30 ha and from EUR 2,000 of SO to EUR 25,000 of SO. Most of the authors agreed that less than EUR 4,000 of SO should be considered as a very small farm rather than a market-oriented farm. In the present research, Lithuanian small farms were classified into two additional classes: very small farms with less than EUR 8,000 of SO, and medium-small farms from EUR 8,000 to less than EUR 25,000 of SO. Therefore, the size of a small farm in this study is assessed on the basis of two indicators: the economic size of the farm based on standard output (SO), and the area of the farmland. The results of the study showed that in Lithuania, a small farm with a maximum of EUR 25,000 of SO would correspond to a farm of a maximum area of 20 ha.

Although structural changes in agriculture are taking place in Lithuania, small farms are still a significant component of the agricultural sector. Together, very small and medium-small farms accounted for more than ninety percents of all the farms in Lithuania and even more of these farms cultivated a land area of less than 20 hectares UAA. Economically small farms in Lithuania are diverse by specialisation and according to whether or not there is a single dominant activity. Almost forty percents of all economically small farms could be categorised

as being crop specialised farms, with a large specialisation in field cropping, quarter of economically small farms were specialised in livestock farming and more than a third of economically small farms are of mixed production.

Our research on the economic size of farms and its interconnections revealed that in Lithuania a lower area threshold of 20 ha UAA could be applied to define a small farm in physical terms. Furthermore, on the individual family farm, the physical size of the farm in hectares of UAA positively affects the economic size of the farm in euros of SO, but that correlation is weaker in economically small farms. Therefore, this supports the conclusions that farms of the same physical size can be different in economic size for various reasons (e.g. type of crop grown or animal bred, soil quality, landscape features, climate conditions, resources available, etc.).

Analysis of the farm income per labour unit shows significant differences among farms of various economic-size classes in Lithuania. In 2017, the average farm income expressed in farm net value added (FNVA) per annual work unit (AWU) was the lowest in very small farms (less than EUR 8,000 of SO) at a level of EUR 2,062. This is more than thirteen times lower than in very large farms (EUR 25,000 or over of SO). It is noteworthy that an even greater income gap between the smallest and largest economy classes of farms was discovered by determining the average family farm income (FFI) expressed per family work unit (FWU), i.e. almost 83 times lower in small farms. It should be noted that all analysed indicators show that productivity decreased in both analysed categories of economically small farms over the last medium-term period (2010–2017).

Small farms are of very large significance in economic, social, cultural and environmental aspects of sustainable development of agriculture in rural areas of Lithuania. Business uncertainties and the environmental impact of farming justify the important role that the public sector plays for farmers (small farmers included) in Lithuania. Direct payments are considered to have the greatest impact on the development of the Lithuanian agricultural sector. Decoupled, as well as coupled, support has a significant impact on the profitability and viability of farms. Market regulation measures were considered to be of less importance, as they have only an indirect impact on the performance of small farms—with the exception of the dairy sector, where market regulation measures were of vital importance in milk crisis management. The support provided to Lithuanian farmers under the 2014–2020 RDP is not connected with farm size. Only one

of more than 20 existing support measures is dedicated to small farms (support for small farms with less than EUR 8,000 of SO). In this context, support for small farms under the 2014–2020 RDP is insignificant in comparison with other support measures due to its small number of beneficiaries. Measures which can be considered as being partially dedicated to small farms include: ‘Investments into agricultural holdings’, with granted a higher aid intensity for some specialised farms; ‘Setting up of young farmers’, which covers support to young farmer’s with an SO of between EUR 8,000 to EUR 70,000, and ‘Payments to farmers in areas with natural or other specific handicaps’, in which farms of up to 100 ha get 100% of payments (those with more than 100 ha see a reduction in this payment). There is a need to continue this study in order to exploit the real benefits for small farms from different types of public support measures.

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CHAPTER 5. Small farms in the Czech Republic

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Abstract

The aim of this chapter is to interpret the developmental trajectory of the farm size structure in the Czech Republic. The agrarian sector in the Czech Republic has undergone several significant changes in the last 30 years. The transition after 1989 has also brought a series of quantitative and qualitative modifications in the farm size structure. The number of farms increased. A large number of farms have operated with a very small acreage of land; and at the same time, a rather small number of farms operated a vast area of agricultural land, generating a substantial output in the industry and creating new employment opportunities. Due to the interconnection of ownership structures, the actual concentration of farms in the Czech Republic is probably even higher than shown in the basic overview. On the other hand, there is still a large variety of farms of miscellaneous sizes. The results show disparities in the economic efficiency of farms of different sizes (analysed in the period from 2015 to 2018). The overall conclusion is that the results indicate a positive state and positive tendencies in the development of the farm size structure in the Czech Republic's agriculture. The current size structure creates the prerequisite to compete within the business environment of the current value chains. The farm structure is quite similar to the one in United States. The difference in comparison to farm size structures in other EU states does not seem to be a handicap, but a competitive advantage. The lower economic efficiency of small farms suggests that a change in their business strategy is needed towards differentiated production (special, regional etc.), and in combination with non-agricultural profit-making activities, at an appropriate level of intensity of the use of natural resources. In this sense, even small family farms will be a permanent part of the agrarian structure of the Czech Republic.

Key words: agribusiness, size of farm, agricultural policy, the Czech Republic.

JEL codes: Q01, Q54.

5.1. Introduction

When defining the overall CAP priorities and strategies for the 21st century, one of the challenging issues is how to systematically address the need for improvement of the competitiveness of European agriculture within the World agrarian markets [Bečvářová and Zdráhal 2013]. This is a challenging question and the answer must be provided for agrarian sectors in member states that are different according to their structural features and performance. The answer is going to have implications for nearly 10 million farms in the EU28.

The share of European agriculture on the world markets has declined and the discrepancies in the scope and in the performance of agrarian sectors between the old and new EU members have grown [Bečvářová et al. 2008]. This creates additional context, which is important to the policy decision making process and generates a variety of opinions on the content, strategy, mechanisms, incentives and funding schemes of the CAP in the post-2020 period, including the necessity to find adequate assessment criteria.

An important part of the discussion is the size of the farm itself. It has given rise to a wide range of questions related to the theme of farms and their effective functioning in modern agriculture [Davidova et al. 2009; Swinnen 1999; European Commission 2011; Tamáš 2010; Zdráhal and Bečvářová 2013a; Zdráhal and Bečvářová 2013b; Guiomar et al. 2018]. What does a vital farm in the 21st century's agricultural landscape look like? It is possible to derive efficiency resp. competitiveness of farms directly and only from their size?

This suggests that currently there is an inter- and an intra- EU Member States' discussion taking place; moreover, effort has been undertaken in order to define the optimal size of farms in terms of their economic, social and environmental sustainability, according to the level and forms of support within the agrarian policy. Finding a suitable answers is of paramount importance especially due to the dynamic and qualitative changes in the environment of global agribusiness, but also because the framework for the further development of EU agriculture is

largely formed by the system and rules of CAP instruments in which the size of the farm appears as one of the criteria.

The aim of this chapter is to interpret the developmental trajectory of the farm size structure in the Czech Republic as a part of a much broader discussion on the position and dynamics of small farms in the European Union. When comparing the average size of agricultural holdings in the EU Member States to that of the Czech Republic, the Czech Republic shows the highest average farm size and its farm size structure is often seen as atypical in the European region.

5.2. Change in the farm size structure in the Czech Republic

The agrarian structure in the Czech Republic has undergone several significant changes over the last 100 years, which have affected its development and the modifications in its farm size structure. The most important ones include the land reform of 1918, the World War II period, and the period following immediately after the war (the second and third post-war land reform), collectivisation of agriculture in the 50's, and the transformation of the sector within the context of general economic reform after 1989.

The developments in the political situation after 1989 brought a significant change in the formation of the production base in the Czech Republic's agriculture. It was insisted that the development of the agrarian sector should follow quite liberal parameters and guidelines adopted for the whole national economy at the macroeconomic level. Simultaneously, exceptionally complex modifications in agriculture had to be implemented. Those modifications were incomparably more complex (both in range and in effects) in comparison to the changes in other sectors of Czech economy, namely because of (1) the restoration of ownership and (2) the restoration of market mechanisms.

The economic reform initiated after 1989 in the Czech Republic considered restoration of ownership as one of the fundamental principles of the transition to a market economy. Already at this point, it revealed its complexities and difficulties, as it was a restoration of the ownership of the agricultural land and forests which went through many changes over the past fifty years. These changes were caused not only by land reforms and the collectivisation of agriculture itself, but also by various transfers of real estate, including the transfers of land among co-

operatives and the state sector, transfers of land during mergers of cooperatives etc. In 1989, i.e. at the beginning of the implementation of economic reform, the structure of farms in the Czech Republic was as follows:

Table 1. The structure of farms in the Czech Republic in 1989.

Form	Number	Avg. size (ha)	% of total agri. land
Private farms	3,205	4	0.4
Cooperatives	1,024	2,561	61.4
State farms	174	6,261	25.3
Others	599	452	12.9
Total	5,002	799	100

Source: Bečvářová and Zdráhal 2013.

The overview in table 1 shows that the restoration of land ownership affected almost 100% of agricultural land and a similar scope of restoration had to be completed in the case of other movable and immovable properties. The restoration was accomplished via the implementation of the following three processes: (1) restitution, i.e. restoration of property rights to the expropriated property, (2) transformation of agricultural cooperatives and (3) privatisation of state-owned property.

The renewal of ownership relations occurred simultaneously with the transformation of farm types and their adjustment to new conditions in the business environment and, as a result, it led to changes in the size structure of farms. In 1998, it could be characterised as follows:

Table 2. The structure of farms in the Czech Republic in 1998.

Form	Number	Avg. size (ha)	% of total agri. land
Private farms	32,968	25	23.5
Cooperatives	2,458	618	43.3
State farms	809	1,394	32.2

Form	Number	Avg. size (ha)	% of total agri.land
Others	406	86	1.0
Total	36,641	96	100

Source: Bečvářová and Zdráhal 2013.

In general, new types of farms (or forms of farms) emerged as a consequence of the complex processes taking place during the transition period. The new farm structures in transitioning economies revealed great diversity. They corresponded to the existence of significant differences in applied technologies, resource availability and suitability of corporate and sectoral forms in specific contexts; moreover, other factors such as the ability of these farms to function in the context of the region also played a role. Different countries often have differing paths of development and adaptation [Swinnen 1999; Swinnen 2009].

The transformation and restructuring processes in the Czech Republic, as in other transitioning economies, gradually led to an increase in the number of agricultural holdings. Furthermore, large industrial farms were not disassembled and at the same time a large number of small agricultural producers appeared. In other words, at this stage of development in the Czech Republic's agriculture, a large number of farms operated with a very small acreage of cultivated land; at the same time, a relatively small number of farms operated a vast area of agricultural land and generated a substantial output in the sector.

The characteristics of such farm structures were considered different in comparison to the typical farm structures in the EU-15, mainly due to the high average size of these farms (higher concentration of production base) as well as because of the lower share of family farms. The following figure shows the numbers of agricultural holdings and also the agricultural land operated in each size category in 2003, i.e. one year before the Czech Republic joined the European Union.

In 2003, there were 54,071 farms in the Czech Republic. The majority of them were smaller than 5 hectares. This size class consisted of 30,520 farms, which represented 56.4% of all farms; on the other hand, it represented only 1.2% of agricultural land (44,969 hectares). There were 5,972 farms of an area between 5 and 40 hectares. This group represented 11.0% of all farms and 1.1%

of all agricultural land. There were 9,564 farms between 10 and 50 hectares in size; this group represented 17.7% of all farms and 5.7% of all agricultural land (206,645 hectares). The segment of the biggest farms can be described as follow: there were 725 farms measuring between 1,000 and 2,000 hectares and this group represented 1.3% of all farms and 28.3% of all agricultural land (1,024,423 hectares); and there were 392 farms bigger than 2,000 hectares operating almost 1.2 million of hectares.

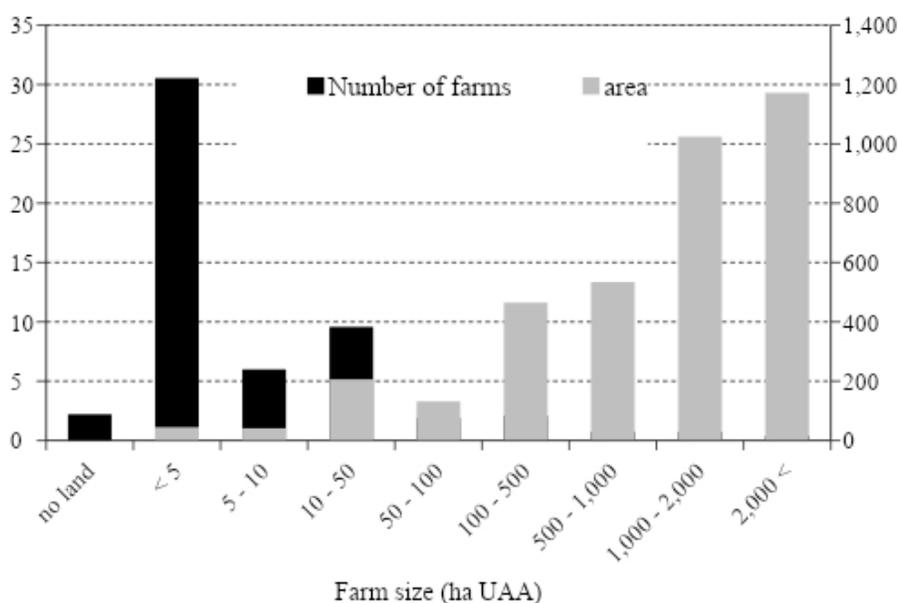


Figure 1. Farm size structure in the Czech Republic in 2003.

Source: FSS 2003.

The current structural transformation of the EU's agrarian sector is influenced by the dynamics of the business environment of the globalizing agribusiness value chains and networks [Bečvářová and Zdráhal 2013]. Such a change in business environment has been also influencing the development of Czech agriculture and its farm size structure (actually, even before the Czech Republic joined the European Union and its impact was further intensified because of the

competition on the common market of the European Union). Ongoing changes in the CAP also bolstered further structural changes.

Under these, qualitatively largely new conditions, there were further changes in the number of farms as well as in the individual size of farm segments, regardless of whether measured by farmed land or the economic size of the farm.

It should be noted here that the reported numbers of farms in individual years are influenced by the nature of the statistical survey and the utilised thresholds: therefore, a farm may be included or excluded from the total set of farms in the survey depending on the selected thresholds. The differences between the number of farm in individual years are a result of the extent to which the smallest agricultural producers have been included in or excluded from the survey. Table 3 shows the numbers of farms reported by the Register of Agricultural Entrepreneurs [RAE 2019], Agrocensus Surveys [Agrocensus 2010], Structural Surveys in Agriculture [FSS 2003; FSS 2005; FSS 2007; FSS 2013; FSS 2016] and listed in the Yearbook of the Ministry of Agriculture of the Czech Republic [MZe 2019].

Table 3. The number of farms in the Czech Republic according to different data sources

	2000	2003	2005	2007	2010	2013	2016
RAE	–	–	30,904	33,571	40,437	44,055	55,485
Agrocensus	56,487	–	–	–	22,864	–	–
FSS	–	54,071	42,252	39,396	–	–	–
FSS1	26,539	–	23,233	–	–	26,246	26,525
MZe	56,487	54,812	46,385	50,887	46,477	48,119	47,604

Note: RAE – Register of Agricultural Entrepreneurs, Agrocensus – Agrocensus Surveys, FSS – Structural Surveys in Agriculture and Mze – Yearbook of the Ministry of Agriculture of the Czech Republic. ¹recalculated using the same threshold values as in 2010 Agrocensus Survey

Source: RAE 2019, Agrocensus 2010, FSS 2003, FSS 2005, FSS 2007, FSS 2013, FSS 2016, MZe 2019.

Despite the limitations in the possibilities of assessing year-over-year changes in the number of agricultural holdings, the data indicate that the number

of agricultural holdings in the Czech Republic has decreased in the period under review (after 2000). The data from the Structural Surveys, which were methodically adjusted according to the Agrocensus 2010 thresholds (the threshold value was 5 ha), indicate specifically that this decrease concerns mainly the category of the smallest producers (up to 5 ha). On the other hand, the numbers of farms over 5 ha show relative stability (they fluctuate between 23 and 26.5 thousand farms). What is more, the following figure (figure 2) shows the changes in each size category between the year 2003 and 2016.

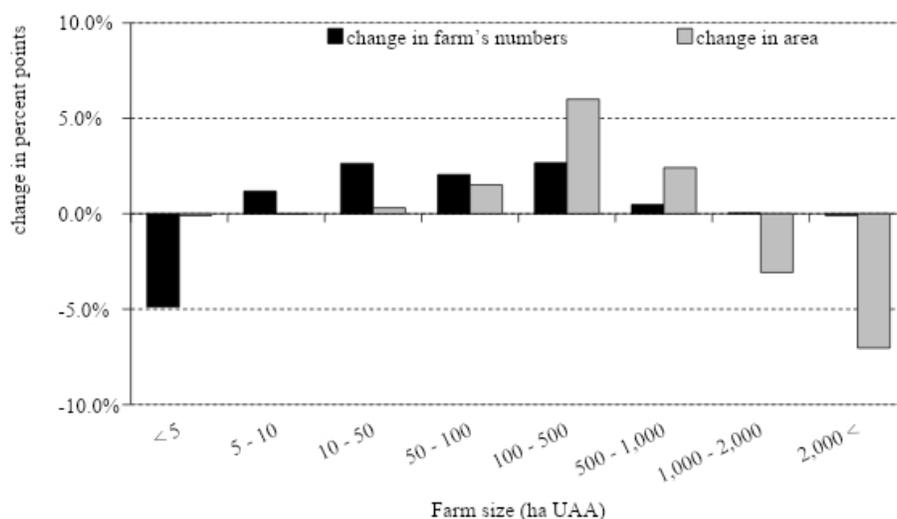


Figure 2. Change in the farm size structure in the Czech Republic between 2003 and 2016

Source: FSS 2003 and FSS 2016.

Between 2003 and 2016, the number of farms declined especially in the class of up to 5 hectares (-4.9 p.p.). Also, as a consequence of this decline, the proportion of farms of other size classes increased (except for the 2,000 hectares and more class). The informative ability of the analysis is significantly better when looking at changes in the distribution and proportion of farmed land between the size classes. The distribution of agriculture land operated by large farms (from 1,000

to 2,000 and 2,000 and more) declined by -3.1 resp. -7.0 percent points. This could indicate a certain disorganisation of large farms.

However, this data needs to be evaluated with great circumspection as it doesn't take ownership structures into account. Each farm is perceived by statistical reporting as an independent unit. Nonetheless, it may be the case that these large farms have been divided, but in terms of ownership they are still managed by the same business (corporate) entity. Currently, a number of holding type groups operate in the Czech agrarian sector and the extent of land under their operation can be in tens of thousands of hectares. The actual size structure of farms in the Czech Republic is probably even more concentrated than shown in the basic overview. On the other hand, there is still a large variety of farm types and sizes (table 4).

Table 4. The farm size structure (numbers of farms; UAA in the category; livestock units LSU; average size) in the Czech Republic according to economic size (2016)

Specification	Holdings (No.)	UAA (ha)	LSU	UAA (ha) per holding	LSU per holding
	2016	2016	2016	2016	2016
Agricultural holdings total*)	26,525	3,455,409	1,635,505	130.3	64.0
small (I–V)	15,720	173,186	70,533	11.0	4.5
medium (VI–IX)	8,794	999,464	319,888	113.7	37.0
large (X–XIV)	1,920	2,281,674	1,245,085	1 188.5	721.7
1. Specialist field crops	8,009	1,202,511	76,105	150.2	9.3
small (I–V)	3,590	45,026	2,814	12.5	0.8
medium (VI–IX)	3,732	420,875	21,214	112.8	6.0
large (X–XIV)	687	736,610	52,076	1 072.2	88.1
2. Specialist horticulture	406	5,225	155	12.9	0.5
small (I–V)	111	329	25	3.0	0.0
medium (VI–IX)	243	2,472	130	10.2	0.6
large (X–XIV)	52	2,424	0	46.8	0.6

Specification	Holdings (No.)	UAA (ha)	LSU	UAA (ha) per holding	LSU per holding
	2016	2016	2016	2016	2016
3. Specialist permanent crops	3,099	32,682	854	10.5	0.4
small (I–V)	2,340	4,448	175	1.9	0.1
medium (VI–IX)	705	14,119	411	20.0	0.6
large (X–XIV)	54	14,116	268	261.4	9.0
4. Specialist grazing livestock	9,182	821,397	472,324	89.5	49.8
small (I–V)	6,469	89,385	50,416	13.8	8.1
medium (VI–IX)	2,445	414,000	217,132	169.4	84.6
large (X–XIV)	268	318,012	204,776	1 186.6	728.5
5. Specialist granivores	351	20,948	389,211	59.6	1 076.0
small (I–V)	120	242	965	2.0	7.7
medium (VI–IX)	106	1,985	15,784	18.7	130.4
large (X–XIV)	125	18,721	372,463	149.8	2 931.6
6. Mixed cropping	267	47,877	9,617	179.2	44.1
small (I–V)	115	1,276	161	11.1	1.1
medium (VI–IX)	123	6,001	493	48.6	3.3
large (X–XIV)	29	40,601	8,963	1 400.0	264.2
7. Mixed livestock holdings	819	142,958	134,609	174.6	176.1
small (I–V)	603	4,360	3,297	7.2	6.1
medium (VI–IX)	137	9,257	7,842	67.5	73.9
large (X–XIV)	78	129,341	123,470	1 658.2	1 587.4
8. Mixed crops – livestock	4,301	1,180,725	552,629	274.5	126.7
small (I–V)	2,371	28,120	12,679	11.9	5.4
medium (VI–IX)	1,303	130,755	56,881	100.4	47.8
large (X–XIV)	627	1,021,851	483,068	1 629.7	789.6

Note: UAA – utilised agriculture area; LSU – the livestock units

Source: FSS 2016.

5.3. Disparities in the economic efficiency of farms of different sizes in the Czech Republic

An important feature of the development of the size structure of farms in the Czech Republic is the differentiation of their economic performance. The results show disparities in the economic efficiency of farms of different sizes (this conclusion is based on the analysis in the period 2015–2018). The data comes from the Farm Accountancy Data Network [FADN CZ 2019]. The sample of farms included in the FADN CZ survey consist of approx. 1.450 farms that operate 850 thousand hectares and represent 23–24% of agricultural land in the Czech Republic. In the presented research only conventional farms from FADN CZ were included, i.e. those with a major production focus on field crops production (15., 16.), milk production (45) other cattle rearing (46., 47.) and mixed agricultural production (61., 73., 74., 83., 84.). The numerical designation of the main types of production included in brackets is based on the typology of FADN EU and FADN CZ 2017. The sub-sample thus consists of on average of 993 farms (on average), operating an area of 772 thousand hectares of agricultural land. In order to take into consideration their economic size, 14 FADN size classes were aggregated into the following three groups:

- small farms classes IV. and V, SO = 8 – 24,99 thous. EUR
- medium farms from VI. to IX, SO = 25 – 500 thous. EUR
- large farms from X. to XIV, SO more than 500 thous.EUR

The SO is Standard Output according to FADN methodology. Economic size classes I–III. (very small farms) have not been analysed in the FADN CZ sample.

The results presented here use indicators calculated in accordance with the standard methodology of FADN EU and FADN CZ. The indicators provide information about the production of farms and economic results of farms. The sum of the values of inputs for production, depreciation and costs of so-called external factors (wages + rent + interest) were (in line with FADN) adjusted by adding up the value of ‘unpaid work’. The contribution of unpaid work to the costs is valued using average annual personnel costs per worker (AWU) in small and medium-sized enterprises (12.7 thousand. EUR / AWU). Such a wage would correspond to 87% of the average wage paid to workers in agrarian sector in the Czech Republic in the given years.

The analysis of different levels of economic efficiency between groups of farms of different sizes focuses on two groups of factors and contexts that determine and influence economic efficiency in agriculture. The first group of factor is the level of technical and economic efficiency. The second group of factors is given by the market and wider socio-economic environment of the agribusiness value chains. The level of technical and economic efficiency is evaluated using indicators of productivity of basic factors of agricultural production. The economic efficiency conceived as a ‘summary’ of the technical-economic efficiency and of the level of management in the existing market and socio-economic conditions and it is measured by profitability indicators – profit / loss is calculated as the difference of revenues and costs including the aforementioned ‘unpaid work’ valuation.

5.4. Productivity of farms of different size and production orientation

The results suggest that large farms achieve a significantly higher level of productivity of the primary factors of agricultural production compared to small and medium-sized farms. According to the results shown in table 5, the large farms in 2015–2018 on average reached:

- 1.8 times higher productivity / intensity of land and soil-related natural inputs;
- 1.1 times higher total productivity of labour and material inputs;
- 1.6 times higher productivity of labour.

Table 5. Productivity of farms of different sizes in the period 2015–2018

Indicator	Economic size of farm			
	small	medium	large	total
Number of farms	57	485	451	993
UAA / farm ha	23	151	1 546	777
LSU/ha	0.41	0.24	0.42	0.40
Agri. Output / ha EUR	710	980	1 610	1 549

Indicator	Economic size of farm			
	small	medium	large	total
Total output /costs EUR	0.54	0.81	0.85	0.84
Total output/AWU EUR	16 803	48 705	69 157	67 948

Source: Authors calculations based on FADN CZ 2019.

An assessment of the differences between large farms compared to the small and medium-sized farms, according to the intensity of land use, shows that the higher intensity achieved by large farms is due to:

- 83% higher input per 1 ha and,
- 17% higher levels of productivity in comparison to small and medium-sized farms.

The higher level of productivity of the primary factors in the case of large farms suggests higher technical and economic efficiency of production. This result comes not only from the scale of innovation in biotic and abiotic technics and technologies, but also from the contribution of scale economies and savings in transaction costs associated with the positioning of large farms in the mainstream value chains.

The higher level of used input in the case of large farms is mainly a result of the structure of production, as is the higher proportion of livestock production and intensive crops when compared to small and medium farms.

Particularly significant differences between farms of different sizes can be seen in labour productivity. Large farms achieve labour productive 69 thous. EUR per AWU, medium farms 49 thous. EUR per AWU and small farms 17 thous. EUR per AWU. These differences are related not only to the already mentioned differences in the intensity of agricultural production, but also to the different number of employed workers. Small farms use 5.47 AWU / 100 ha, medium farms 2.24 AWU / 100 ha and large farms 2.70 AWU / 100 ha. The share of paid work (external labour force) is only 5% in the group of small farms; 91% of the total AWU in the group of large farms.

There are significant differences in the productivity among farms of different economic size and with different orientations in production. The results of

the analyses of the intensity of agricultural production are presented in Tab. 6, which shows that:

- large farms achieve a significantly higher intensity of production in all production orientations; the small and medium-sized farms differ considerably less in intensity;
- the highest intensity that can be identified in the group of dairy farms, and the differences between size groups, are smaller.
- farms with field production show relatively smaller differentiation in intensity.
- the large farms with the predominant rearing of other cattle show significantly higher differences in intensity of production.

Table 6. Agricultural production per 1 ha of farms in different size categories and different production orientation in the Czech Republic in 2015–2018 in EUR/ha

Production orientation	Farms			
	small	medium	large	total
Field crops production	805	986	1,309	1,242
Milk production	x	1,494	1,815	1,792
Other cattle rearing	521	553	1,125	789
Mixed agricultural production	1,035	940	1,719	1,694

Source: Authors calculations based on FADN CZ 2019.

The differences in the aggregate productivity of labour and material input are shown in Tab. 6. The results indicate that:

- large farms revealed comparable levels of productivity among the different production orientations; significantly higher are the differences in the case of small and medium farms.
- farms with a predominant field crop production show the highest aggregate productivity; the differences between size groups are relatively small.
- the lowest total productivity was achieved in the case of cattle rearing, but there are also relatively high differences between farms of different sizes.

Table 7. Total productivity of labour and material inputs of farms in different size categories and different production orientation in the Czech Republic in 2015–2018; Total production / adjusted costs in EUR

Production orientation	Farms			
	small	medium	large	total
Field crops production	0.61	0.84	0.90	0.89
Milk production	x	0.82	0.80	0.80
Other cattle rearing	0.44	0.56	0.78	0.67
Mixed agricultural production	0.62	0.63	0.84	0.84

Source: Authors calculations based on FADN CZ 2019.

The results of analyses of labour productivity show smaller differences between size groups in the case of the field crop production and of the dairy production and higher differences in the case of the cattle rearing and of the mixed production. The differences in labour productivity among the groups of farms mainly stem from the differences in the level of intensity of agricultural production as well as from the aforementioned differences in employment (AWU). This suggests different patterns of labour substitution by technology.

Table 8. Labour productivity of farms in different size categories and different production orientation in the Czech Republic in 2015–2018; AWU in EUR

Production orientation	farms			
	small	medium	large	total
Field crops production	23,115	60,954	82,398	79,497
Milk production	x	37,446	55,662	54,575
Other cattle rearing	13,395	27,738	59,448	39,771
Mixed agricultural production	17,130	39,367	68,660	67,952

Source: Authors calculations based on FADN CZ 2019.

5.5. Effects of subsidies on profitability of farms

Using the return on profitability (profit / revenues in percentage points), there is a particularly high difference between the profitability of small and medium farms and large farms. The data in table. 9 suggest a substantial economic loss in the case of small farms.

Table 9. Profitability of farms in different size categories in the Czech Republic in 2015–2018

Production orientation	farms			
	small	medium	large	total
Number of farms	57	485	451	993
Profit/loss/ha (EUR)	-433	113	129	127
Rentability (of revenues) %	-33.8	8.1	5.6	5.8
subsidies/ ha (EUR)	382	326	373	369
Subsidies per 1 EUR of agriculture production (EUR)	0.54	0.32	0.23	0.24

Source: Authors calculations based on FADN CZ 2019.

The main causes of the differences in profitability of small, medium and large farms are as follows:

- the differences in the levels of profitability are primarily a result of the different levels of agricultural production intensity, which are significantly higher in the case of large farms.
- factors contributing to the level of labour productivity and material input have a significant impact. In the case of large farms, this is linked to (1) a higher pace of adapting innovation, (2) the exploitation of scale economies and to (3) the positive effects of being in a better position in the markets of input and products (in other words – effects coming from the position of a farm in the value chain)

- differences in profitability are significantly affected by higher employment per hectare in small farms and higher wages/salaries of large farm workers.

Small farms use 2.8 AWU / 100 ha more in comparison to large farms. In profit creation, this corresponds to a profit of around 355 EUR / ha.

Operational subsidies for farms (paid from EU CAP and national sources) are a crucial component of farm economics. Farms in the surveyed group made a profit of 127 EUR / ha on average at a profitability rate of 5.8% on average in 2015–2018. Without subsidies, farms would incur a loss of – 242 EUR / ha and a profitability rate of – 11%. Financial results of this kind would undoubtedly jeopardise the financial stability of farms.

These subsidies are allotted to farms mainly according to the area of farmed land; to a lesser extent, they are distributed in commodity-oriented programs. The level of subsidies is relatively balanced (subsidies per 1 ha) in groups of farms of different sizes and of production orientations. The criterion of subsidies per unit of agricultural production is also important when assessing the allocation of subsidies in agriculture. Data in tab. 9 shows that the current system of subsidies somewhat ‘reduces’ the effects that the differences in productivity among farms of different sizes have on the profitability of farming.

5.6. Agricultural policy towards small farms in the Czech Republic

The evolution of the farm structure in Czech agriculture was significantly changed during the implementation of economic reform after 1989. The policy aim, to create an environment for the establishment of family farms, was already formulated in the Transformation Act of 1992. However, at the same time, the full application of liberalisation steps in the agrarian sector was accompanied by the abolition of direct financial support of farmers’ income. The economic pressure put on the efficiency of farming was increased. As a consequence of that, most of the new land owners did not start farming and they kept their land in newly formed cooperatives of owners.

In the period 1994–1997, there was a need to deal with the increase in economic problems encountered by the many newly established farms. The solution consisted of attempts at partially mitigating the negative impact, that the whole

economic reform had on the economic situation and the social position of farmers and other rural inhabitants, through state intervention based on non-market support. In less favourable agro-ecological areas, so-called direct payments for maintaining the landscape in the cultural state were introduced. Despite the announced support for development and social issues, however, the overall level of support continued to decline. This affected primarily the conditions for the development of newly established small farms. At the same time, the availability of bank loans declined. A positive step, which has been applied since 1994, was to utilise a part of the state budget expenditures for subsidies (transfers) for agriculture, in order to guarantee credit and as a form of support for improving access to loans. This system was implemented through a newly created Fund (PGRLF).

The Act on Agriculture No. 252/1997 Coll. aimed at creating conditions for ensuring food security from domestic resources in the Czech Republic; its other goal was to provide support to social and environmental functions in rural areas. This approach was also reflected in the subsidy system since 1998. Priority was given to areas with the least favourable agro-ecological conditions, with the goal of supporting non-production functions. This included the support of the development of organic farming.

Because of the Czech Republic's accession to the EU, a number of necessary measures for the implementation of the CAP were applied already before the Czech Republic joined the EU. The most important aspect of the full application of the CAP in its broader structural context was the implementation of the Special Pre-Accession Program for Agriculture and Rural Development (SAPARD). The program was launched in April 2002 and it included: (a) the implementation of the already mentioned *acquis communautaire* concerning the Common Agricultural Policy and related policies; (b) addressing priority and specific problems of sustainable adaptation of the agricultural sector and rural areas.

The main challenges facing the Czech Republic's agriculture were as follows: the strengthening of the competitiveness of the agrarian sector and of the manufacturing sectors with the aim of achieving high quality agricultural and food products with higher added value; the completion of restructuring agricultural and processing firms; and, finally, the strengthening of the agrarian sector's position on the market. For the Czech Republic, there were a number of prerequisites and special tasks necessary for dealing with these challenges, such as the creation of conditions for clear identification of land ownership and the

development of a market with land, undoubtedly a positive step for small and medium-sized farms.

Changes in the business environment were also related to the need for further support of rural development and for the creation of a suitable environment for the rural population and development of villages. There was a need to diversify economic activities in the rural areas using local resources to secure alternative incomes. This priority was also associated with the application of sustainable farming methods aimed at protecting the environment and the landscape.

Agrarian policy measures were applied horizontally. Programs of environmental protection and support of sustainable agriculture were focused primarily on so-called sensitive areas to further protect landscape areas and water protection zones, which cover approximately 1/3 of the territory of the Czech Republic.

The accession of Central and Eastern European countries to the EU in 2004 and the adoption of CAP rules and limits were the first steps in the entry into a significantly changing environment. This was not only due to the need to address the overproduction of agricultural commodities in EU member states (accompanied by pressure on market liberalisation in the European region) but also to 'justify' the maintenance of instruments regulating the supply base in the form of quotas and other quantitative restrictions. For the new Member States (under the phasing-in regime) the income support system has been suggested in the form of direct payments from the EU fund (increasing gradually from 25% of the level of payments compared to the original EU15 in 2004 and reaching 100% in 2013). Up to 55% of the level of direct payments in the Community could be paid out of the national top-up payment which, to some extent, created an asymmetric environment especially for small producers in the new Member States.

The philosophy and concrete strategies of the member states (in relation to the agrarian sector and rural development including the conditions for the development of small farms) were much more strongly reflected in the implementation of Pillar II of the CAP. The common interest in the development of agriculture, in its production and non-production contexts and benefits for rural development, has become part of the implementation of the Rural Development Programs (RDP) of the EU Member States. It was also reflected in the EC Regulation 1698/2005 establishing the European Agricultural Fund for Rural Development (EAFRD) since January 2007, where only minimum limits for the allocation of funds to individual axes were set centrally. The Czech

Republic has based its concrete measures on the basic framework of the CAP to ensure a strategic level of EU food production sustainable management of natural resources and the development of rural areas. At the same time (with a higher market pressure) this required an increase in the competitiveness of farms (while ensuring adequate production safety and its environmental effects).

The knowledge of conditions and dynamics of business environment changes are reflected in the selection of priorities in the Rural Development Program (RDP) in the 2014–2020 programming period. In accordance with the Regulation of the European Parliament and of the Council the ESIF Regulation, this policy should lead to increased competitiveness of farms through further restructuring and growth of labour productivity; moreover, it should contribute to environmental protection, ensuring sustainable development of rural areas based on sustainable agriculture forestry water management and fisheries in integration with quality processing of agricultural products.

In line with the Europe 2020 strategy these general objectives for rural development support during the 2014–2020 period are expressed in more detail through the following six EU-wide priorities. Any measure offered by the Rural Development Regulation can contribute to the objectives of several priorities. The priorities are as follows:

- Promoting knowledge and innovation transfer in agriculture, in the forestry and in rural areas,
- Increasing the viability of farms and the competitiveness of all types of farming in the regions and promoting innovative agricultural technologies and sustainable forest management,
- Support for the organisation of the food chain including processing and marketing of agricultural products, animal welfare and risk management in agriculture,
- Restoration, conservation and improvement of agriculture and forestry-related ecosystems,
- Promoting resource efficiency and promoting the transition to a low-carbon climate-resilient economy in the agriculture, food and forestry sectors,
- Promoting social inclusion, poverty reduction and economic development in rural areas.

Certain priority was given in favour of projects from 1 to 5 million CZE and in the case of farms up to 150 hectares and thus the owners of smaller farms could fund the investment. Projects with a value of up to 5 million crowns were also successful in allocating subsidies for adoption of technology and for the processing and marketing of agricultural products. In accordance with EU legislation, young farmers were supported by 25% of the premium to SAPS per hectare (for a maximum area of 90 ha of the total farmland area). The basic conditions for obtaining direct payments were the minimal requirements, i.e. the acreage of land of at least 1 ha. From the point of view of creating the preconditions for increasing the ability of small farms to compete, the quality and regional labels were introduced.

5.7. Conclusions

The agrarian sector in the Czech Republic has undergone several significant changes in the last 30 years. This also involved changes in the size structure of farms. The transition after 1989 brought another series of modifications in farm size structure. The agrarian structures in the European Union, although now forming a common agrarian market, are subject to the Common Agricultural Policy (which provides some freedom at a regional level, but also seeks common solutions). They are still affected by the historical development of the country. Differences also exist in the state of farm structures, varying in numbers and sizes of farms. The size structure of EU farms varies not only between Member States but considerable diversity can be found within these Member States. Nevertheless, several general trends can be observed: (1) the number of farms is decreasing and the average size of farms has been increasing in the long term (2) the number of farms is decreasing mainly in the size category of small farms and their share in the total output of the agrarian sector is decreasing as well.

It follows from the above that the size structure of farms in the Czech Republic corresponds to the development and tendencies of developed countries and that the current structure sets some preconditions for competitiveness within the mainstream value chains and networks of agribusiness.

The conclusions on the differentiation of the economic efficiency of farms of different sizes primarily support a positive assessment of the development

of the size structure of farms in the Czech Republic's agriculture. The current farm size structure in the Czech Republic is very similar to the size structure of farms in the United States. Its difference from the EU average does not seem to be a handicap (as sometimes stated) but a competitive advantage.

The low economic efficiency of small farms suggests that a change in their business strategy is needed and that they should generally move towards specialised production with regional sales in combination with non-agricultural activities (and, of course, the achievement of appropriate levels of intensity in the use of natural resource)s. The lower economic benefits are likely to be acceptable for seniors' farms and 'lifestyle' farms, where the financial return is rather an additional income for the owner. In this sense, even small family farms will remain a permanent part of the agrarian structure of the Czech Republic.

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CHAPTER 6. Small farms in the Republic of Serbia

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Abstract

The purpose of this study is to recognise how small farms in Serbia function within the country's agricultural sector. Scientific papers and the statistical data from the Statistical Office of the Republic of Serbia were used for the statistical review of the state of agricultural holdings in the Republic of Serbia. According to the Statistical Office of the Republic of Serbia, most of the utilised agricultural area in Serbia is occupied by family farms with up to 5 hectares of land and an average economic size (standard output) of €4,999. However, there are also very large farms, so the production structures in Serbian agriculture are polarised. The main barriers to operating small agricultural holdings are low marketability, lack of specialisation and favourable loans, limited physical resources (small land area, insufficient of their own capital and facilities for storage), insufficient social capital (such as farmers associations, co-ops and chambers of commerce). Despite the dominance of small farms in Serbia and their crucial importance for providing employment and slowing the migration to cities, there are no clear policies and measures for helping small farms. This does not mean that small producers are marginalised in the distribution of incentives. However, to improve their economic performance and increase the competitiveness of their products, it is necessary that small farms in Serbia work together to overcome internal limitations, with support from the state.

Keywords: agricultural holdings, small farms, features of small farms, incentive measures.
JEL codes: Q12, Q18.

6.1. Introduction

Despite the general decline of the contribution of agriculture to GDP, this sector remains quite significant in developed and medium-developed countries like the Republic of Serbia [Ortiz-Ospina and Lippolis 2017]. In classic terms, the basic function of agriculture was the production of agricultural products for direct consumption or for processing in the agri-food industry. Nowadays, scientific literature indicates the growth of many additional functions:

1. Green: managing land resources to maintain its valuable characteristics, creating conditions for wild animals and plants, protecting animal welfare, maintaining biodiversity and improving the circulation of chemical substances in agricultural production systems;
2. Blue: managing water resources, improving water quality, preventing floods, generating hydropower and energy from wind;
3. Yellow: maintaining the cohesion and vitality of rural areas, maintaining and enriching the cultural traditions and the identity of villages and regions, developing agritourism and hunting;
4. White: ensuring food security and the production of healthy food (food security and food safety) [Huylbroeck et al. 2007].

This new approach to agriculture and rural areas means that small farms must be seen differently. Their importance for promoting the vitality of rural areas, shaping biodiversity, strengthening cultural identity, increasing food security and stabilising the labour market must be recognised. Small farms have particular significance in countries where relatively large resources are engaged in agriculture.

Agriculture in Serbia is one of a pillar of economic development, and it is significant for the national economy in terms of economic, social and ecological value [Mihailović et al. 2013]. Serbia has great potential for developing agriculture (conventional and organic) and processing and marketing food. The challenge, however, is to turn its comparative advantages into competitive ones [Pejanović 2016]. Agricultural holdings are created on agricultural land and imply private ownership of the land and other means of production. They display a connection between the land and the family as a source of labour on one hand and as consumers of part of what they produce on the other [Simonović et al. 2018].

Nowadays, a family farm is the basic economic-production unit in a village in the Republic of Serbia and, unlike other forms of organisation in the economy of a state, it has encountered many social and economic obstacles [Prodanović et al. 2017]. Based on the Census of Agriculture 2012, other sources at the Statistical Office of the Republic of Serbia, scientific literature and legislation, as well as experience managing agricultural land as an inherited natural resource, there are two main types of agricultural holdings: family farms and legal entities or entrepreneurs.

According to the Law on Agriculture and Rural Development of the Republic of Serbia (Articles 15 and 16), a family farm can be either a commercial family farm and a non-commercial family farm. A commercial family farm is market-oriented, it has the right to incentive measures under the terms and conditions prescribed by the Law. A non-commercial family farm is not market-oriented, and its holder is the beneficiary of a pension based on agricultural production. Furthermore, non-commercial family farms can claim certain rights to incentive measures established by the Law. Each farm is designated as commercial or non-commercial when it is registered (or when registration is renewed) in the Register of Agricultural Holdings [Pejanović 2007]. The Statistical Office of the Republic of Serbia defines a family farm as having up to 5 hectares (ha) of land and an economic size (standard output) up to €4,999. This paper uses this definition.

The purpose of this study is to recognise how small farms in Serbia function within the country's agricultural sector. Scientific papers and statistical data from the Statistical Office of the Republic of Serbia were used for the statistical review of agricultural holdings in Serbia.

6.2. Statistical review of the state of agricultural holdings in the Republic of Serbia

In 2018, there were 569.310 agricultural holdings in Serbia. Since 2012, the number of agricultural holdings decreased by 9.9% because of the de-agrarisation of villages and concentration processes of area structures. As seen in Figure 1, the region of Šumadija and Western Serbia has the most agricultural holdings (244,068 or 43%), and the Belgrade region has the fewest (30,589 or 5%) not

counting the agricultural holdings in Kosovo and Metohija [Farm Structure Survey 2018].

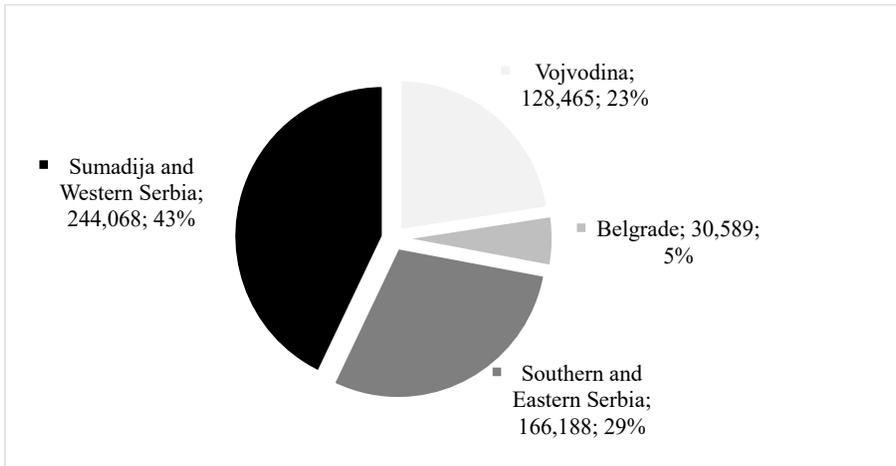


Figure 1. Agricultural holdings in Serbia by regions (2018)

Source: Farm Structure Survey 2018.

Of all the households in Serbia, nearly half (45.7%) have an average standard output (ASO) less than €2.000, while a small number of households (0.3%) have an ASO higher than €100.000 (see Figure 2). These data show the fragmented agrarian structure and the resulting weak market power of agricultural holdings. This relationship between ASO and the number of households is present in the regions Serbia-north and Serbia-south and in the sector of family farms, while in the sector of legal entities and entrepreneurs this does not apply.

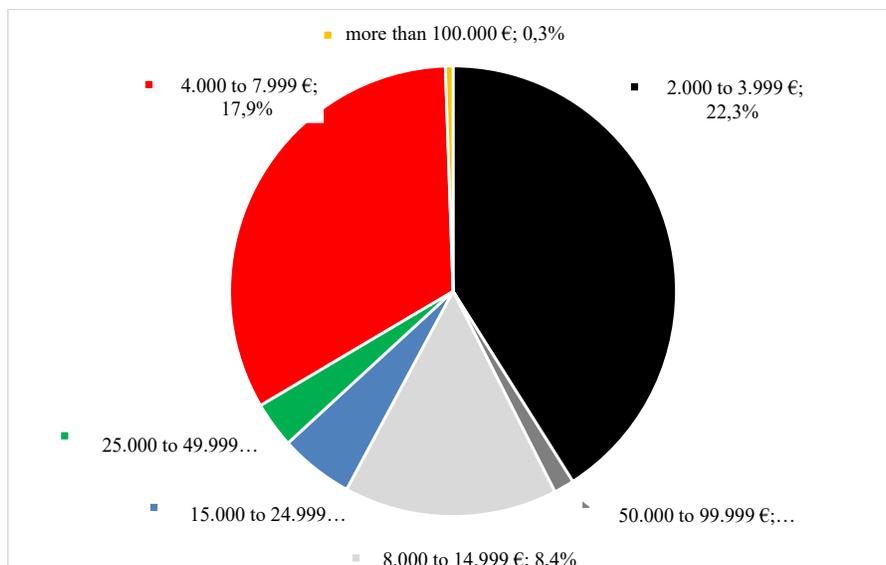


Figure 2. Structure of farms in Serbia based on average standard output (ASO) in 2014.

Source: Own performance based on Paraušić and Cvijanović 2014.

In Serbia, the farms with the largest ASO (€10.828) have holdings that produce vegetables and flowers (although they are the smallest number of farms in this type of production), while farms with the lowest ASO (€2.359) produce vines and fruit (Figure 3) [Paraušić and Cvijanović 2014]. This determines their market competitiveness and shows the need for concentration processes taking into account, however, the conditions for sustainable development. In particular, this is about not increasing environmental pressure or unemployment in connection with the outflow of ‘surplus’ labour resources.

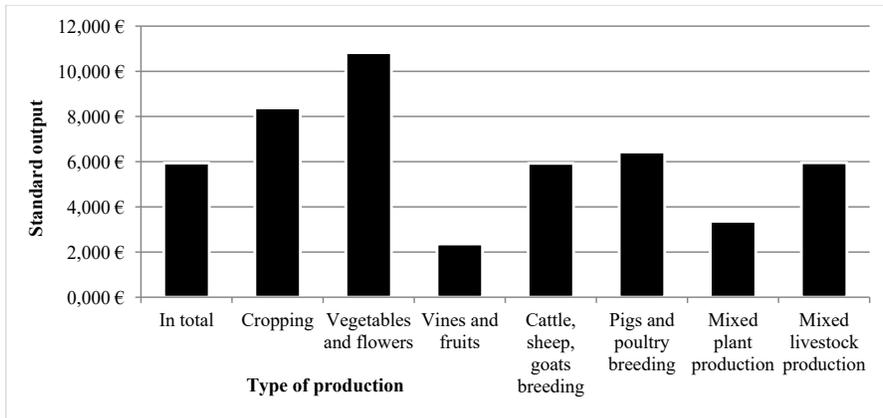


Figure 3. Average standard output ASO of agricultural holdings in Serbia by the type of agricultural production (2014).

Source: Own performance based on Paraušić and Cvijanović 2014.

With the transition to the higher ASO group, the average utilised agricultural area for subsequent groups significantly increased (see Table 1). However, this relationship is not linear. While the largest farms have the most economic strength (over 100,000 €), farms with an ASO of 25–50 thousand are next in terms of average arable area. These distributions result from the direction of agricultural production and number of farms. Family farms with the highest ASO in the Serbia-north region use about three times as much agricultural land as the family farms with similar ASO in the Serbia-south region [Paraušić and Cvijanović 2014].

Table 1. Average utilised agricultural area (ha) of agricultural holdings in the Republic of Serbia, by ASO (2012).

Standard output (thousand euro)	0.0–1.99	2.0–3.99	4.0–7.99	8.0–14.99	15.0–24.99	25.0–49.99	50.0–99.99	More than 100.00
Average utilised agricultural area	1.2	2.8	5.0	8.8	15.5	30.2	71.0	375.2

Source: Own performance based on Paraušić and Cvijanović 2014.

6.3. The role and importance of small farms in the Republic of Serbia

Small agricultural producers in Serbia play an important role in agricultural production, self-employment and creating a general economic environment in rural areas [Zarić et al. 2008]. General public and practical agricultural policy focus their attention on family farms. The vitality of small farms and the many examples of their economic performance and rational management created the need to redefine their importance, place and role in the strategy of agricultural development [Pejanović 2007]. Small family farms in Serbia provide many benefits to society, such as food safety, high-quality agricultural products, employment and family income. They preserve the ecology and adapt local resources, and they preserve traditions and cultural heritage.

In terms of owned structure, the importance of individual holdings is immense. However, the possibilities of small farms are not fully realised, mainly because they are small and without adequate and sustained support from the state. There is also a need for developing the agricultural land market through legislation determining the conditions of its turnover. Small family farms are based on family labour, that is, senilisation (depletion of the soil) and de-agrarisation, which can lead to less employment potential in villages in Serbia [Simonović et al. 2018].

These are the most important features of small farms in Serbia [Paraušić and Cvijanović 2012]:

- *Importance of the farms.* The small family farms is of great importance in the local commodity market, from the aspect of food production (contribution to self-sufficiency and food security) and from the aspect of preserving resources and the rural environment.
- *Developmental limitations.* Small farms are burdened by (a) the lack of their own capital (money), (b) the lack of favourable loans, (c) the lack of markets, and (d) low prices of agricultural products. They are also limited in the following areas:
 - *Human resources* (the lack of agricultural knowledge and skills; low rate of entrepreneurship for applying innovations and business expansion; the lack of desire, interest in gaining knowledge, and joining associations).
 - *Physical resources* (a small area of land, the lack of facilities for storage, the lack of equipment for storing and packaging agricultural products, absence of conditions and facilities for processing agricultural products).
 - *Social capital.* Most of these producers are not united since there are undeveloped/inactive organisations such as chambers of commerce and farmers' co-operatives, farmers who are not aware of the need and importance of association, and lack of trust, both among farmers, and between farmers and local/republic authorities.
- *The absence of vertical integration of farmers* in the production and market chain of food supply, long-term contracts, ownership links with the food industry, farmers' co-ops and trade.
- *Extensive agriculture.* Because of decades of disinvestment and inefficient organisation of production and trade, the farms are traditional, not very productive, highly oscillatory, and dependent on climatic factors.
- *Low marketability.* The small size of agricultural land per farm leads to an inability to use economies of scale, resulting in a lack of competitiveness of domestic producers, limited opportunities for foreign and domestic customers in terms of quantities, continuity and quality of supply and low standards of quality in the entire food supply chain.

- *Low specialisation.* The unsecured business environment, small property, the absence of favourable loans, and the need to reduce the risk of production and profits lead to a low specialisation of the producers.
- *Rural poverty and underdeveloped rural environment.* The low economic value of the farms is directly related to rural poverty and low living standards of the rural population.

A more detailed analysis of the ownership structure of agricultural holdings, based on the data from the Census of Agricultural 2012, points to significant differences between the three subgroups of all farms: small (up to 5 ha), medium (5–20 ha) and large (over 20 ha). The differences between the three subgroups are reflected in a huge disproportion of the number of each subgroup in the total number of farms, the total of utilised agricultural area and significant polarisation.¹ Moreover, according to the principles of concentration of production and centralisation of the land as a productive resource, the vast majority will stagnate or reduce the area of their property. Some will even give up on agricultural production because of the absence of successors or because the successors lack of interest in continuing family traditions and organisation of agricultural production on their own farms.

6.4. Differences between small and large agricultural holdings

According to the Statistical Office of the Republic of Serbia, family farms represent the highest number of farms (99.4%) and have the largest share of the total utilised agricultural area (82.2%), but they have the smallest average area (4.55 ha). On the other hand, agricultural holdings by legal entities and entrepreneurs account for just 0.5% of the number of farms. However, because of the amount of utilised agricultural area they have (17.8%) and especially their average area (204.12 ha), they are important production-economic entities in Serbian

¹ Small farms (up to 5 ha) account for 77.4% of the 631,522 farms, but they have only 25.0% of the 3,437,425 ha of utilised agricultural area. Large farms (over 20 ha) account for only 3.1% of the number of farms, but they have 44.2% of the utilised agricultural area of all agricultural holdings. Medium-sized farms (5–20 ha) account for 19.5% of the number of farms and have 30.8% of the utilised agricultural land, with a tendency to be further divided into smaller parts that will increase the utilised agricultural area and the specialisation of production.

agriculture. There is a relatively large share of agricultural holdings of legal entities and entrepreneurs without land ownership (23.2%), most is leased.

In the structure of the total utilised land of all agricultural holdings in Serbia [Agricultural Land in Serbia, 2012] most property is owned (87.8%) and the rest is leased. Family farms dominate in Serbia in the total available area (66.2%), owned land (60.2%) and the rest is leased land. The economic class that has the largest number of agricultural holdings in the Republic of Serbia (288,559 or 45.7%) has an average ASO value than €2,000. Finally, the smallest number of agricultural holdings (1,902 or 0.3%) belongs to the class with an ASO of €100,000 or more [Agricultural Land in Serbia 2012].

The study of the Statistical Office of the Republic of Serbia, called Agricultural Holdings by Economic Size and Type of Production in the Republic of Serbia (2014), emphasises the simultaneous increase in the economic strength of agricultural holdings and utilised agricultural area of farms. Agricultural holdings of the lowest economic size (from 0 to 1,999 €) use the least agricultural land on average (only 1.2 ha per farm), while farms with the highest economic size (€100,000 and more) use the largest area of agricultural land (375.2 ha per farm). This shows that agriculture in Serbia is polarised in terms of production structures. Its further transformation depends on developing non-agricultural sectors of the economy and the related demand for labour resources, as well as developing the agricultural land market.

Of the total number of agricultural holdings (family and legal entities and entrepreneurs) in the Republic of Serbia, 12.4% have other profitable farming activities, while 42.9% (family agricultural holdings) have other profitable non-farming activities. Most agricultural households with other profitable non-farming activities have very little economic size² (0–1,999 €). Only a tiny fraction (0.04%) of agricultural holdings with other profitable non-farming activities have an economic farm size of €100,000 or more [The Statistical Office of the Republic of Serbia 2014]. This is because, in a situation of low agricultural incomes, small farms seek income from outside agriculture, while large units are not very interested in it. It is a common phenomenon, well recognised in the literature, that small farms—in various countries—function poorly because of a lack

² As much as 43.6% of the households with other profitable non-farming activities belongs to the poorest farms

of competitiveness and low market power [Grzelak 2015; Haggblade et al. 2010; Pfeiffer et al. 2009].

6.5. Support policy for agriculture in Serbia

The most important form of state support for the agriculture sector comes through the agrarian budget within the overall budget of the Republic of Serbia. This political practice was introduced in 1996, to provide stable financial resources to stimulate the development of agriculture and rural areas [Strategija 2014, p. 43]. Political changes in the country during the 2000s brought many challenges to the country's economy. The first task of the newly formed leadership was to begin institutional changes, above all in the adoption of new regulations, while the special challenge was to suppress the grey economy. In the agricultural sector, significant efforts were made to restore the production of meat, sugar, fruit and vegetables, whose volume declined because of the country's isolation and economic sanctions, and because of the loss of earlier markets [Strategija 2014, pp. 40–41]. In that period, the policy of incentive measures was primarily focused on strengthening production, with a particular focus on the fields that contribute to the strengthening of the food sector and the growth of exports. Institutional changes in the agricultural sector were happening slowly, because of inaccurately defined competencies (responsibilities, jurisdiction issues) of the republic and federal bodies. In agriculture, transferring competencies from the federal to the national level was completed in 2004, when unlike the previous period a shift in strategic methods and implementation mechanisms was made [Strategija 2014, p. 41]. During the following year, *The Agricultural Development Strategy of Serbia* was adopted, so that agricultural policy was aimed at contributing to the growth of competitiveness of family commercial agricultural holdings. In the implementation mechanisms, a shift was made from incentives based on production and income to investment incentives. However, the strategy did not have a clearly defined budgetary framework, so, until 2008 the objectives were only partly supported with the appropriate measures and funds. The following period was one of major instability in agricultural policy, with frequent changes in direction and the mechanisms of the incentives [Strategija 2014, pp. 41–42].

To give clear direction for future reforms in the agricultural sector, the Ministry of Agriculture and Environmental Protection urged the development of a new strategy. This resulted in the adoption of the *Strategy of Agriculture and Rural Development of the Republic of Serbia for the period 2014–2024*. This strategy defines a vision for developing agriculture and rural areas, which assumes developing the knowledge-based agricultural sector, modern technologies and standards and management of rural areas in line with the principles of sustainable development, aiming to prevent the trend of population migration from rural areas. This Strategy rests on four principles: 1) *Sustainable agriculture*, within which agriculture is recognised as the most important industry in rural areas; 2) *Polycentric development, based on the respect for the diversity of production systems and types of agricultural holdings*, highlighting the equal position of all producers and other participants involved in the production chain of the agricultural sector and related activities; 3) *Modernisation of bodies and organisations*, with special emphasis on the harmonisation of the national system of agricultural policy management with the EU standards; 4) *Stability and consistency of the agricultural budget*, emphasising the need to adjust (that is, increase) agricultural budget support [Strategija 2014, pp. 60–61].

Market-price support measures, such as export incentives, intervention purchases, operational costs of maintaining public inventories, and co-financing of storage costs were applied in this period. Of all these measures, only export incentives were consistently applied, while the others were applied only occasionally. The share of this group of measures in the total agrarian budget steadily declined in the analysed period, from 32% in 2004 to 0.2% in 2011, after which these measures were abolished and replaced by direct incentives [Strategija 2014, p. 46].

From 2004 to 2012, direct support measures for production included direct payments to producers based on output (price support), payments per hectare and per livestock cattle, as well as subsidising inputs (recourses, interest rates, insurance premiums, etc.). In the analysed period, about 64% of the agrarian budget was allocated for this group of measures [Strategija 2014, p. 46]. In this period, apart from a milk premium, the support measures experienced significant dynamics, so they did not give clear business signals to the producers. Authors of the Strategy concluded that market support was guided by pragmatic reasons and attempts to stabilise farmers' income in particular circumstances [Strategija

2014, p. 46]. Moreover, there was a general tendency to reduce price incentives. At the beginning of the analysed period, the milk premium (the most important measure of price support) accounted for 20% of the total agrarian budget, but its share declined to 10% by the end of the period, when the other forms of price support were abolished. The share of direct subsidy payments increased in this period. In 2007 they became the dominant form of support for agriculture, representing over 50% of the agrarian budget. However, in the resource structure of input subsidisation, there were strong oscillations with a tendency to concentrate on diesel fuel support and the use of mineral fertilisers.

The significance of structural measures and the measures of rural development policy gradually decreased in the period 2004–2013. The largest part of these measures included the incentives for investments in agricultural holdings—grants for construction and reconstruction of facilities, procurement of equipment and mechanisation and renewal and extension of perennial plants [Strategija 2014, p. 47]. The aim of these measures was to provide more favourable conditions for farms in hilly or mountainous areas, as well as farms owned by younger persons; whereby the dynamics of project evaluation criteria ranged from supporting farms owned by women to supporting the Roma or refugees [Strategija 2014, p. 47]. The general conclusion, stated in the Strategy, is that developing rural economy, by supporting the diversification of agricultural income and improving infrastructure, was modestly present in the support structure. Support for general measures and services in agriculture was not aimed directly to agricultural producers, but the goal was to establish better business conditions in agriculture (inspection work, research and development activities etc.). Table 2 shows the amounts invested to stimulate agricultural development in the country in the observed period.

International assistance in agriculture has intensified since 2001; in the first half of the analysed period it was implemented mainly in the form of technical assistance (equipment, laboratories, vehicles) and employee training (primarily to prepare for the adoption of the EU procedures and regulations) [Strategija 2014, p. 50]. According to the analysis of the international assistance outlined in the Strategy for 2014–2024, from 2007 to 2012 the agricultural sector, with approximately 91 million EUR of the realised assistance, was ranked eighth among all recipients. The largest donor in this sector was the EU with 58 million EUR realised between 2007 and 2013 [Strategija 2014, p. 51].

Table 2. Budget support for agriculture in Serbia in 2013–2019 in Serbian dinar

Year	Direct payments	Rural development	Special incentives	Loans	Outstanding obligations	Total
2013	21.562.693.875	134.082.142	314.132.542	–	4.897.369.570	26.908.278.129
2014	28.009.580.206	660.599.481	394.036.364	357.104.872	5.041.218.495	34.462.539.418
2015	17.576.384.180	965.710.829	466.791.247	125.605.359	3.757.943.919	22.892.435.534
2016	16.359.806.370	2.775.594.997	180.321.827	360.972.034	3.600.730.400	23.277.425.628
2017	16.241.302.566	6.393.205.535	149.381.486	469.999.062	3.520.841.614	26.774.730.263
2018*	16.021.813.000	3.264.443.157	217.130.534	660.000.000	–	20.163.386.691
2019*	19.120.314.000	4.727.500.000	230.000.000	400.000.000	–	24.477.814.000

*The data for 2018 and 2019 have not been published, so the analysis of the support policy for those two years is based on the planned amounts

Source: reports on the state of agriculture in the Republic of Serbia in 2013–2019.

Of all foreign incentive programs, the IPARD II³ EU Program is one of the most significant, being an instrument for pre-accession assistance in rural development for the 2014–2020 program period. According to the amendments to the IPARD Program for the Republic of Serbia for the period 2014–2020 (March 21st, 2019), a special status of small farms was not defined. The program was not implemented in 2017.

6.6. Conclusions

Most of the utilised agricultural area in Serbia is occupied by family farms with up to 5 hectares of land and an average economic size (standard output) of €4,999. Although their number is very big, their economic significance is not at a satisfactory level and their possibilities are not fully realised. On the other

³ IPARD II Program is the European Union's instrument for pre-accession assistance in the field of rural development for programming period 2014–2020, with budget of 229.970.558 EUR.

hand, there are very large farms, so the production structures in agriculture are polarised.

The Republic of Serbia has a favourable factors and trade conditions for developing intensive and competitive agriculture, but the agriculture in small farms is characterised by low marketability, lack of specialisation, limited physical resources (small land area, insufficient of their own capital and facilities for storage), insufficient social capital (such as farmers associations, co-ops and chambers of commerce). As a consequence, there is still considerable development potential for agriculture in Serbia. It is still an open question what proportion of small farms will increase their economic size and improve their market competitiveness. The dynamics of developing non-agricultural sectors in the economy and developing the land market (including legislation determining the conditions of its turnover) seem to be key here.

Despite the dominance of small farms in Serbia and their crucial importance (employment, slowing the process of migration to cities), the policy of support does not have clear measures for helping small farms. This does not mean that small producers are marginalised in the distribution of incentives. The policy of supporting small farms is conditioned by the official harmonisation of their identification and the recognition of a special status that these farms can have in the distribution of incentives. The big challenge the current tendency toward agricultural land fragmentation, which could endanger the sustainability of agricultural production. To improve their economic performance and increase the competitiveness of their products, it is necessary that farmers of small farms in Serbia engage actively in overcoming internal limitations, with the necessary implementation of many incentives from the state.

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CHAPTER 7. Small farms in the Republic of Moldova

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Abstract

The agricultural sector in the Republic of Moldova is dominated by large cooperative farms, which have a significant share in the agricultural production of the country. At the same time, the number of smallholders accounts for about 98% of the total number of land users. The social well-being of these farms represents an important issue for the Republic of Moldova. Due to their importance in the sustainable development of the country and their role in raising food security, small farms require state support. However, proper targeting of this support depends on an in-depth diagnosis of the situation of these farms. Hence, the aim of the chapter is to present the current situation of the small farms in the Republic of Moldova, based on an analysis of the existing data and previous researches. The first two parts of this chapter present some introductory concepts and basic information about the agricultural sector in the Republic of Moldova. The following two sections explain the understandings of a small farm's definition in Moldova and provide a set of data on the number, size and production of small farms. The fourth section contributes to the understanding of national and international policy that is contrary to the interests of small farms in Moldova. The last section offers concluding remarks regarding these topics.

Key words: small farms, Moldova, agricultural policy.

JEL codes: Q01, Q12, Q15.

7.1. Introduction

The agri-food sector is of strategic importance for the social and economic development of the Republic of Moldova. In addition to its significant share in the GDP and in total country exports, the agricultural sector has a recognised influence on rural development and poverty reduction in the rural area and on environmental and food security. With 57.3% of Moldovians living in rural areas and 32.3% of the active population employed in agriculture, this sector alone accounts for 12.2% of the GDP and 22.6% when combined with the food industry.

The agricultural sector in the Republic of Moldova is currently dominated by large cooperative farms, which have a significant share in the agricultural production of the country. At the same time, the number of smallholders accounts for approximately 98% of the total number of land users. The social well-being of smallholders represents an important issue for the Republic of Moldova. Because they are more likely to be exposed to indigenous and exogenous hazards, it is becoming increasingly important to enhance smallholders' living and working conditions.

However, important structural changes are taking place in rural areas. Small farms tend to become involved in different production activities. Most of them specialise in a variety of agricultural activities, such as vegetable production, growing fruits or nuts, producing dairy products and making wine. Taking into account that most of these products are for self-provision, only a small part of these products succeed in accessing foreign markets. Farm income in rural areas contributes less than 20% on average of the total household income and most farm households rely on additional income sources, primarily pensions and wage employment and, to a lesser extent, remittances. Therefore, instead of commercialisation, farm households often opt for diversification toward non-farm income, which is more effective in lifting them out of poverty. The aim of the chapter is to present the current situation of small farms in the Republic of Moldova, based on an analysis of the existing data and previous elaborated researches.

7.2. Agricultural sector in Moldova – basic information

Moldova has made essential progress in land structure since 1998–99, when the change in the political atmosphere triggered a jump in the intensity of agrarian reform efforts. Private land ownership rose from practically zero in 1989 to approximately 67% of all agricultural land in the beginning of the 21st century [87% in 2018 (authors' note)], and land plots were physically distributed to more than one million rural people, 30% of Moldova's population [Lerman and Sutton 2006].

As a result of the reforms carried out, the land had been separated into plots, being divided into three types: arable, vineyards and orchards. Afterwards, land of each of the types was given to each eligible household. The average family was entitled to plots of between 1.5 and 2.5 ha. This led to a phenomenon that the Republic of Moldova faces even today, an excessive fragmentation of land. At the same time, a few thousands of large farms specializing in extensive crop production have appeared. These farms have been operating on land plots rented from the rural population and offer a limited number of jobs [Dudwick, Fock and Sedik 2007].

Within the process of privatisation, four categories of farms emerged: small individual farmers; individual commercial farmers; farmers in associations with close relatives; and farmers in groups (from less than ten farmers to large, joint-stock companies). The last category comprises either groups formed spontaneously and making decisions by mutual agreement or segments of old collective enterprises that retain some efficiency but meet new types of managerial problems [FAO 2001].

After the privatisation process, a series of problems that had to be handled by smallholders appeared. First of all, the small size of the farms allowed only the production of several crops, primarily through manual labour. Use of modern equipment or machinery was not affordable for the majority of small farmers, making them vulnerable to climate changes, with limited access to resources, inefficient production, etc.

Currently, the Moldovan agricultural sector is composed of two major sub-sectors: the corporate sector comprising large companies and the individual sector that includes peasant farms and household land on private property. Small farms, especially subsistence and semi-subsistence farms, generate a limited surplus of high value-added crops (fruits, nuts, grapes, vegetables, potatoes) that are mostly

sold in open-air agricultural markets. The land resources and business activities of most small farms cannot provide sufficient income. Small-scale production does not allow the development of technological progress for both technical and financial reasons. A lack of educational and professional experience also prevents smallholders from increasing productivity and accessing new markets.

At the same time, large-scale agricultural companies specialise in the production of low value-added crops (such as cereals, oilseeds and sugar beets), and employ a limited labour force due to the high level of mechanised agricultural operations. This specialisation has been driven by a number of factors, such as the relatively low production cost of these crops, the availability of agricultural machinery allowing rapid cultivation on large areas, relatively simple and cheap post-harvest facilities, as well as assured markets for these commodities [Moroz, Ignat and Lucasenco 2014].

Table 1. Small vs large farms in the Republic of Moldova

Small farms	Large farms
Occupy 25.4% of total land used (2018*)	Occupy 74.6% of total land used (2018).
Estimated at approx. 363 thousand farms (2017).	Estimated at approx. 6700 farms (2017, co-operative farms and peasant farms managing 10 and more ha).
<p>The specialization of small farms is related to their aim of production.</p> <p>For-self consumption: farmers engage in trade only if an unplanned surplus of goods appears. Specialisation on cereals, sunflower, small production of vegetables and fruits on households plots and limited livestock production.</p> <p>Semi-commercial: an over-production of some commodities, compared to farmers' consumption needs, is planned. Are multipurpose, oriented to several categories of production.</p>	<p>Specializing in production specifically for large plots, but with a low value added: cereals (wheat, maize, barley), oleaginous crops (sunflower, rapeseed), technical crops (sugar beet).</p> <p>A limited number of large farms produce highly valued goods: livestock, vegetables and fruits, ethero-oleaginous crops and others.</p>

* Household plots and gardens that represented 306 thous. ha in 2018 (283.6 ha sown area and 22.4 thous. ha multiannual plantations have not been taken into account).

Small farms	Large farms
Commercial: production of several categories of goods allows small farmer to be efficiently commercial, in order to generate a sufficient level of income. Commonly includes potatoes and vegetables, fruits, nuts and grapes, and livestock products (in particularly milk, honey).	
Commercial component is less obvious, products are directed mainly for own consumption or for selling in local open-air markets in small amounts or to neighbours. Some products are sold to processing factories or traders.	Commercially oriented toward both internal and external markets.
Limited market integration opportunities.	Better access to markets.
More likely to include additional activities (non-agricultural).	Largely specialised on agricultural activities. Exceptions worthy of notice: companies specialised in international transport, processing; some traders begin to invest in large-scale agriculture. A limited number of large farmers try to extend their activities.
Intense use of the family labour force in most cases, with no specialised education in the field.	Employ people. Number and structure of employees differ depending on the field of activity of the farm.
A great social impact, as they are presented as a safety net.	Oriented toward own income, less socially active or responsible.
Limited capacities to access financing and subsidies.	Better access to financing, including subsidies.
More labour intensive.	Less labour intensive.
Lacking modern production tools.	Better equipped with the necessary machinery and instruments.
Lack of negotiating skills.	Stronger bargaining power for accessing resources and selling goods.
Agricultural activity is done mainly on own land.	Manage own land and have lease agreements with smallholders.

Source: own elaboration.

7.3. What is a Moldavian small farm?

The concept of a small farm is not expressly defined within a legal act or regulation in the Republic of Moldova. Moreover, there is no concrete definition of a small farm or smallholder. A lack of data for estimating the standard output of a farm led to public acceptance of the size criteria for small farms, which better fits the particularities of the Republic of Moldova. Taking into account the above-mentioned fact, the definition adopted in a publication of the National Bureau of Statistics, ‘Agricultural activity of small agricultural producers in the Republic of Moldova’ [NBS 2018], seems to be the most adequate. According to it, small agricultural producers are households, peasant farms with agricultural land of up to 10 ha registered according to the rules, as well as the persons who received equivalent shares of the land but did not register their agricultural household.

At the same time, when calculating the standard agricultural costs, the National Institute for Economic Research (NIER) uses the 3-hectare threshold for defining small farms. The approach used by NIER is mainly based on a social component, i.e., small producers with a land area under or equalling 3 ha are in most cases those who cultivate small plots intended for the farmer’s consumption or for sale in local open-air markets. Holders of small farms can also apply for social benefits from the state.

An adequate definition of subsistence and semi-subsistence farms in Moldova should reflect the specific farm structure in the country. Therefore, even very small farms should not be omitted. Defining the farm size according to income figures (economic size) is, in theory, preferable, but highly complex. The main limitations of this criterion are, first, data availability, in particular regarding the smallest entities, due to a lack of precise record-keeping, and second, its reliance on standardised values, which could be erroneously misinterpreted as the actual economic results of the agricultural holding [World Bank Group 2016].

7.4. Small farms dataset

Agricultural land in the Republic of Moldova includes arable land and permanent crops covering 2.04 million ha and representing 60.3% of the total country area. The zonal particularities of the soil are represented by three types of soil: chernozem (70% of total), brown and grey soils.

Like other former Soviet republics, Moldova conducted a land reform that included the transfer of land from the state to private ownership, followed by allocation of individual titles to land and property (or real estate), and finally, registration of those individual rights. The progress with land privatisation has not been fully matched by progress in the individualisation of agriculture, an important aspect of agricultural land being controlled by large-scale corporate farms.

Excessive fragmentation of agricultural land underlies a number of problems in the development of agriculture and consolidation of the individualisation of agriculture. Land fragmentation includes two dimensions, the farm size, on the one hand, and fragmentation of the smallholdings into several parcels, on the other. The division of land into small plots did not allow for intensification of agricultural production and for benefiting the scale effect in the use of agricultural technologies, the supply of resources, and the processing, transportation, storage and marketing of agricultural products. However, the data of the National Bureau of Statistics on land use (Table 2) demonstrate the tendencies of land consolidation. The share of peasant farms managing less than 10 ha have decreased from 26.6% in 2011 to 20.7% in 2018. 52.2% of the agricultural lands are cultivated by corporate farms or farms that cultivate more than 50 ha of land.

Table 2. Land use per category of agricultural producers: Arable land (sown area) and multiannual plantations, in thousands of ha

	2011			2018		
	Total	<i>of which:</i>		Total	<i>of which:</i>	
		Arable land, sown area	Multiannual plantations		Arable land, sown area	Multiannual plantations
Total	1,596.0	1,477.2	118.8	1,683.9	1,544.3	139.6
Peasant farms managing less than 10ha	423.1	375.3	47.8	349.8	298.4	51.4
Agricultural enterprises and peasant farms managing over 10ha,	841.0	787.8	53.2	1028.1	962.3	65.8
<i>of which:</i>						
<i>Agricultural enterprises</i>	744.8	701.4	43.4	855.4	804.7	50.7
<i>Peasant farms managing over 10ha</i>	96.3	86.4	9.8	172.7	157.6	15.1
Household plots, gardens	288.4	272.0	16.4	306.0	283.6	22.4

Source: own elaboration based on data of National Bureau of Statistics of the Republic of Moldova, 2011 and 2018.

The total number of small farmers is inaccurately portrayed based on the data collected by the National Bureau of Statistic.¹ A total number of 363,231 of fam-

¹ In the case of registered peasant farms, it is presumed that one farm includes the land plots of all family members, but in the case of unregistered equivalent shares of land it includes separate data for different family members.

ily farms can be estimated for 2018, including registered peasant farms and the estimated number of family farms based on the number of plot holders (Table 3). The number of registered peasant farms is decreasing, while the number of unregistered lots of lands is increasing. Two factors are influencing these tendencies: i) after the death of the owners, the land is divided among children; ii) there is a tendency to cancel the registration in order to reduce the taxes. The existent system of subsidizing covers a limited number of farmers and doesn't represent an efficient means of convincing farmers to maintain their registration.

Table 3. Number of agri producers and sown/yeilding area (2009–2017)

Specification	Number of agri producers						
	2009	2010	2011	2014	2015	2016	2017
Registered peasant farms managing less than 10ha	293,416	297,833	290,876	286,794	286,129	260,620	239,353
People who received equivalent shares of land but did not register their agricultural household	195,740	206,726	227,232	226,741	223,720	244,483	247,757
Agricultural enterprises (companies that declared agriculture and hunting as main activity)	2,302	2,360	2,438	2,930	3,031	3,318	3,723
Peasant farms managing over 10ha	1,245	1,556	2,101	2,707	3,009	3,125	2,971

Source: own elaboration based on data of National Bureau of Statistics of the Republic of Moldova, 2011 and 2018.

The structural changes occur slowly and the growth of a farm is an exception, not the rule. Structural change is often discussed along with the change in farms' sizes. Growing farm sizes are seen as a sign of increasing competitiveness and economies of scale. However, an overall shrinking of farm sizes among small

family farms is observed. At least a part of the released land is being overtaken by large commercial farms [World Bank Group 2016].

The structure of the production on and use of the arable land, in the case of small farmers, follows the general trend, being dominated by the production of cereals and oleaginous crops. Nearly 86% of the arable land in 2017 was used for growing cereals and sunflowers (Table 4). This is in accordance with the trend of producing for farmers' own consumption, including animal breeding [ACSA 2017]. A growth in production can be attributed to improved access to better planting material and seeds, fertilisers and pesticides and to an increase in knowledge. This trend is similar to the that noted in the case of large corporate farms.

Table 4. Farmers managing less than 10 ha, sown areas, thousands ha, thous. tons

Sown areas–total	2013	2014	2015	2016	2017
		362.0	365.0	350.5	338.6	323.4
of which:					
Cereals and leguminous crops–total sown area	249.6	248.6	239.0	226.2	216.3
Cereals and leguminous crops–total production	626.7	702.7	488.6	635.2	697.0
including:					
<i>wheat</i> sown area production	70.7 186.2	69.8 191.5	59.6 137.3	554.4 203.8	60.2 205.6
<i>barley</i> sown area production	25.2 49.5	23.8 46.6	21 35.4	19.2 47.4	19.3 47.6
<i>grain maize</i> sown area production	149.4 386.9	150.0 456.7	152.7 310.3	138.5 554.4	132.8 437.6
<i>sunflower</i> sown area production	59.3 26.3	61.0 81.1	62.0 77.5	64.6 100.4	60.8 107.3

Source: own elaboration based on data of National Bureau of Statistics of the Republic of Moldova 2018.

Small farmers make an important contribution to the nation's fruits and grapes production. A steady growth of production is registered, despite a modest increase in the total area (Table 5). Total production of fruits and berries increased by 1.5 times and grapes by 28% during the period of 2006–2017, while the production of table grapes doubled over a decade. Also, in the same period, a significant increase in production was registered for quinces (3 times), apricots (5.6 times), peaches (2.2 times) and berries (5 times).

Table 5. Perennial plantations, farmers managing less than 10 ha, thousands ha

	2013	2014	2015	2016	2017
Fruits, berries and nuts, total	47.2	39.1	52.5	52.7	51.8
<i>Share in total area per country, %</i>	38.7	32.0	38.7	39.2	37.6
Seeds fruits	29.9	22.4	30.5	30.5	29.7
<i>Share in total area per country, %</i>	45.1	37.8	46.7	49.1	47.5
Stone fruits	16.3	11.9	16.5	554.4	16.0
<i>Share in total area per country, %</i>	39.7	32.9	39.2	39.1	37.3
Grapes, total	60.6	60.1	58.2	57.1	52.8
<i>Share in total area per country, %</i>	44.3	42.8	43.0	42.2	40.7
Of which, table grapes	9.0	9.2	8.9	8.6	7.9
<i>Share in total area per country, %</i>	46.9	44.9	44.6	43.2	40.5

Source: own elaboration based on data of National Bureau of Statistics of the Republic of Moldova 2018.

The livestock sector suffered the greatest losses during the economic crisis of the 1990s. The vast majority of livestock was moved during the privatisation process from large collective farms to small peasant farms, where the extensive cultivation technology of livestock and poultry farming has led to a sharp decline in the production volumes. The recovery of the livestock sector has occurred at a slower pace compared to that of plant cultivation [Moroz et al. 2015]. Thus, in terms of production, a steady decrease can be observed from 1990–2017. Pork, being the largest sub-sector in livestock production, decreased

in 2017 and amounted to only 32.7% of the 1990 value. Cattle saw the largest difference compared to 1990, accounting for only 7% in 2017. From 2010–2017 an increase in pork production occurred, 77.8 thousand tons in 2017 compared to 72.5 thousand tons in 2010. Poultry production also increased during the same period, 106.1 thousand tons compared to 54.7 thousand tons. The increase in poultry and pork production is related to the increase of the capacities of the cooperative farms [Trendov et al. 2018].

Households have made the most significant contribution to the livestock sector (Table 6). Their production includes that for their own consumption and for commercial purposes. The large share of households contributes to the vulnerability of the development of the sector. Because animal breeding is often located within villages, it is therefore identified as household production.

Table 6. Livestock as of January 1 by categories of producers, 2007–2018 (thousands of units)

		2007	2010	2011	2012	2013	2016	2017	2018
Cattle	Agricultural enterprises	18.7	13.2	11.6	12.1	11.6	15.1	18.3	19.1
	Households	280.4	208.5	204.3	191.8	179.5	171.0	164.1	148.4
Pigs	Agricultural enterprises	66.8	94.5	139.4	120.6	142.0	185.7	191.4	184.5
	Households	465.0	282.6	339.1	318.0	268.4	267.4	247.6	221.9
Sheep and goats	Agricultural enterprises	36.1	23.7	20.0	20.8	17.7	27.7	25.1	25.8
	Households	910.9	891.2	885.4	811.6	806.3	840.9	844.7	816.8
Rabbits	Agricultural enterprises	7.8	4.8	1.3	0.7	0.7	15.1	11.4	13.2
	Households	..	..	..	..	..	335.1	355.3	363.2
Bee families, piece	Agricultural enterprises	6.1	4.9	4.6	3.6	3.8	2.9	3.1	2.6
	Households	..	..	..	..	..	133.0	145.0	161.1

Source: own elaboration based on data of National Bureau of Statistics of the Republic of Moldova, 2011 and 2018.

This represents an important challenge for the ecological security of the villages, due to the resulting pollution of the groundwater, the main source of drinking water. Many producers, even when their production volumes increase, do not register their production in order to avoid paying taxes.

The majority of farmers managing less than 10 ha produces several categories of products (56.4% of the total in 2017). A significant portion of this production is either oriented toward covering farmers' own consumption needs or can be considered semi-commercial farming. The registered trend of growth in the number of farms specializing in cereal production is related to the increased number of rural inhabitants diversifying their sources of revenue to include non-agriculture activities. Cereals production is oriented toward covering the household's consumption and is preferred, as it requires minimal investments and minimal time and work.

7.5. Agricultural policy towards small farms

Support policy for the agricultural sector of the Republic of Moldova is carried out both through public institutions, responsible for granting subsidies to agricultural producers, as well as through international donors via various programs and projects aimed at increasing the capacities of the agricultural sector.

Until 2010, support for agricultural producers had been allocated through several public agencies, such as the Ministry of Agriculture and Food Industry (measures directly concerning the development of the agricultural sector), the Ministry of Finance (measures related to reimbursement of loans, VAT, etc.), the Ministry of Environment (costs for water pumping) and the 'Moldresurse' State Enterprise (for stimulating the creation of technology machinery stations) [Parliament Decision... 2008].

Currently, the state support for agriculture is provided by the Agency of Interventions and Payments in Agriculture (AIPA), established in 2010. Its primary functions are related to ensuring the correct and legal implementation of managing the funds allocated to support agricultural producers, examining the materials submitted by applicants to determine their eligibility to receive funds from the state in accordance with the established procedures and regulations, creating and maintaining the Register of Agricultural Holdings, as well as

operating the internal control system to ensure the correctness of the applied procedures and systems and their own performance [Government Decision... 2010]. AIPA acts under the provisions of the Law no. 276 from 16.12.2016 on the subsidizing principles in the development of agriculture and rural areas. It allocates financial means for supporting agriculture and rural area development, while the Ministry of Agriculture, Regional Development and Environment is the central government authority responsible for subsidy policy in the development of agriculture and the rural environment. Starting with 2017, the funds allocated for subsidizing come from the National Fund for Agriculture and Rural Development [Government Decision... 2017].

Priorities and measures comprised in the regulation on granting subsidies are attributed to every category of the agricultural producer. From 2005–2018, changes occurred regarding the state priorities concerning the support of the agricultural sector. Thus, though from 2005–2010 most of the support measures had a largely product-based character (subsidizing sugar beet producers, walnuts, tobacco) and included compensations of costs for fuel use or the establishment of agricultural technology stations, since 2011, the measures have had a wider focus, expanding to most of the sub-sectors of agriculture and aiming at increasing investments in selected areas of the sector. In recent years, most of the funds have been allocated within such measures as stimulation of investments in agricultural machinery (166.5 million MDL), stimulation of investments in the development of post-harvest processing and processing infrastructure (158.3 million MDL), stimulation of investments in the purchase of No-Till and Mini-Till equipment (50 million MDL), etc. The measures with the highest shares of subsidizing are oriented toward large-scale producers and the corporate sector, which is able to invest in the agricultural sector and can afford to buy quality machines and agricultural equipment. At the same time, the lack of performance indicators of the state support policy and the impossibility of carrying out a realistic assessment of the existing policies makes it difficult to evaluate the scale of impact of the subsidizing measures thus implemented.

Small producers have been rather disadvantaged by the existing support measures. This disadvantage comes mainly from the fact that many of the small farms in the Republic of Moldova are not officially registered and therefore cannot apply for state support funds. At the same time, small farms are capable of

receiving support only commensurate to their scale of production, meaning in small amounts.

A lack of knowledge, mainly specialised knowledge in agriculture, a lack of experience, difficult access to resources and markets, a low capacity for negotiation, a lack of modern agricultural machinery and equipment, difficult access to water resources (leading to vulnerability given climate changes) and other difficulties represent the main obstacles faced by small farmers, making them unable to or less successful in applying for state support.

For the first time, beginning in 2017, according to the Law on the Subsidizing Principles in the Development of Agriculture and Rural Areas, potential agricultural producers receiving subsidies are classified according to the categories of small, medium and large agricultural producers. Thus, according to the notions presented in the above-mentioned law, a small agricultural producer is an agricultural producer who owns through property rights or has in use up to 20 hectares of arable land and/or 8 to 10 hectares of perennial crops, or from 21 to 40 heads of cattle or from 51 to 100 heads of pigs, sheep or goats. It should be mentioned that though the definition of small farms was established, no special measure focused on small farmers exclusively was adopted.

According to the existing data, in 2018, 2874 small farmers, which make up 65% of the total number of applicants, 1205 medium-sized agricultural producers (27%) and 332 large agricultural producers (8%) applied for subsidies. In 2017, subsidies were received by 3613 unique agricultural producers; according to preliminary data, in 2018, the number of unique agricultural producers increased by 40%, reaching the figure of 4411 producers [AIPA 2018]. Analysis on the distribution of the subsidizing fund for the period 2010–2015 establishes that a major part of the funds were distributed to large farmers. Similar evaluations or data on the distribution of funds after 2017 are not available. At the same time, a small number of small farmers have benefited from subsidies, which are generally related to specific investments in their activities.

Beginning in 2018, young farmers, female farmers and small agricultural producers may benefit from subsidies in advance for start-up projects, for which they may request up to 50% of the value of the investment. Payments in advance can represent a possible solution for small farmers, taking into account that most of them cannot afford to establish new plantations or acquire purebred livestock, which require high initial investment costs. Therefore, since 2018,

subsidies in advance can be allocated within the following measures: stimulation of investments for the production of vegetables and fruits on protected land (winter greenhouses, solariums and tunnels), stimulation of investments in the setting-up of multi-annual plantations and orchards, stimulation of investment in infrastructure and technological upgrading of livestock farms, and stimulation of acquisition of purebred animals and the content of the genetic fund [Government Decision... 2018]. Although subsidies in advance encourage the establishment of new small farms, the current financing measures are quite limited and need to be expanded.

Support for the development of small farms in the Republic of Moldova also comes from international donors; this support is more targeted and focuses in most of cases on the sectoral approach. Since 2001, The International Fund for Agricultural Development (IFAD) has implemented a series of valuable projects in the Republic of Moldova. IFAD is one of the organisations that directly aids small farmers. Each of the seven programs implemented and nearing implementation by IFAD had a component concerning smallholders.

The Rural Resilience Project (IFAD VII) was launched in 2017, with an operation period extending until 2023. The total budget of the project is expected to be approximately 23.7 million USD. The objective of the project is to improve the living standards of the rural population in the Republic of Moldova and to reduce poverty. Project interventions will focus on assistance to structural measures applied in the areas of agriculture, poverty and migration reduction in rural areas, food safety and security, vulnerability to climate change, and increased competitiveness. The first component of the project entirely concerns small farms, improving the adaptive capacity of smallholders and agribusinesses. Enhancing smallholders' resilience and adaptive capacity will enable them to overcome critical climatic and productivity challenges through investments in productive rural infrastructure and agrosystems. This will create more competitive and productive farms with increased incomes and exports [Rural Resilience Project... 2017].

The Inclusive Rural Economic and Climate Resilience Programme (IFAD VI), launched in 2014, will be implemented in the Republic of Moldova till 2020. The estimated project budget is 26.08 million USD. The overall goal of the program is to enable farmers to raise their incomes and strengthen their resilience to climate change. The second component of the program is dedicated

to inclusive rural financing and capacity development. It primarily aims at the financing of rural-based small and medium enterprises' agricultural investments. Thus, in 2017, IFAD provided financial support for 38 small farmers to acquire the basic equipment needed to implement conservation agriculture and organic agriculture practices. At the same time, loans are available through the SME financing facility for rural-based small and medium enterprises' agricultural investments (production, harvesting, sorting, processing, packaging and storage of agricultural products, and livestock production). SMEs would be entitled to a loan of maximum 150.0 thousand USD, which represents 80% of the total loan amount approved, for a period of up to eight years with a grace period of up to four years. The loan amount can be used only for investments and to acquire productive assets. Through the micro financing facility, loans are available to rural-based smallholder farmers, members of Savings and Credit Associations, for medium term investments in rural on- and off-farm income generating activities. Through the Savings and Credit Associations' financing sub-component, by the end of 2017, a number of 601 rural smallholder farmers, including 237 women, had been financed [IRECR 2018].

In recent years, FAO has operated several projects intended for small farms, declaring support to smallholders among their main regional priorities. This support includes:

- Improving small-scale farmers' resistance to drought through a better water management and modern irrigation technologies project, financed through FAO by the Government of Hungary. Its aim was focused on strengthening the drought resistance of small farmers by introducing and adopting best practices in irrigation and modern irrigation technologies. The project lasted from 2014–2018, with a total budget of 398,181 USD. The project resulted in ten demonstration sites with water management technologies, established in the central and southern parts of the Republic of Moldova. The small-scale farmers owning the sites benefited from modern irrigation equipment and received training on its proper operation and maintenance. Over 350 farmers also benefited from these sites, in terms of demonstration activities, such as farmer field schools and field days, learning about the positive impacts of irrigating their own fields. The project also supported 380 local extension specialists and representatives of water users associations through training sessions, strengthening their

capacities in modern on-farm irrigation technologies and best practices [Moldovan Agriculture... 2018];

- Strengthening the capacity of smallholder farmers in national berry production, with the main objective of consolidating the capacities of small farmers in the production of berries by using modern production technologies. The estimated project budget is approximately 455,000 USD for 2018–2019. Taking into account that the project is at the stage of implementation, it is hard to make an assessment on the achievements so far, but according to the plans, the first berry nursery in Moldova will be created, where local farmers will learn how to produce new and improved traditional planting material using innovative technologies. Also, the project intends to publish manuals and guidelines that will be disseminated among farmers, farmer associations, extension service providers and the Ministry of Agriculture, Regional Development and Environment on production and protection methods for several types of berries [FAO 2018];
- Support for the implementation of the Regional Initiative on Empowering Smallholders and Family Farms project (2017–2018) has been implemented within a regional initiative, which includes the Republic of Moldova. The overarching goal is to address the key problems of rural people by empowering smallholders and family farms to improve their livelihoods. Eliminating rural poverty, improving the resilience of rural populations (with a focus on smallholders) and an inclusive growth for rural economies based on sustainable use of natural resources are the basic principles of the initiative [FAO 2018].

Several other donor organisations are implementing projects either based on a selected development area or based on a specific crop's value chain. Most focus on or include measures identifying small farmers as the main beneficiaries.

7.6. Conclusions

The considerations in this chapter allow the formulation of some important conclusions. Firstly, the definitions of ‘small farms’ are rather diffuse and differ from those accepted in other EU countries, hence one has to be careful when making comparison.

Secondly, the number of small farms still dominates the farm structure (with regard to the number of holdings) in the Republic of Moldova; however, one can observe the trend of land consolidation, mostly in favour of large farms. Another interesting observation regards the overall shrinking of farm size among the small family farms. Farm growth among smallholder farms is an exception and not the rule: the large majority of farms do not change their size, unless divided through inheritances. At least a part of the released land is overtaken by the large commercial farms.

Thirdly, small farms are involved in more labour-intensive agricultural activities and often acts as safety nets for rural inhabitants. Many of them are either oriented toward meeting their own consumption needs or function as semi-commercial farms. Cereals production is preferred as it requires minimal investments and minimal time and work, which enables rural inhabitants to diversify their sources of revenue based on non-agriculture activities.

Fourthly, agricultural policies are still less supportive for small farms and are preponderantly oriented toward large-scale farms. There is no structural approach in the government policies for small farmers. In the long term, the effects of this are manifesting in a registered trend of growth in the cooperative sector.

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CHAPTER 8. Common Agricultural Policy towards small farms in the European Union, with particular emphasis on Poland

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Abstract

The purpose of this article is to determine the impact of the Common Agricultural Policy on the development of small farms in the European Union, with particular emphasis on Poland. The spatial scope of the analysis concerns EU countries, with particular emphasis on Poland; the subject scope is representative agricultural holdings in EU countries (they comprise, depending on the year, between 4,045,300 and 5,295,930 farms). The article shows that small agricultural holdings in the EU earn less than farms overall when they increase productivity and lose more than farms overall when they reduced production capacity during the recession. Results show that meeting the requirements of agri-environmental programs in small farms is associated with relatively low inputs and an alternative cost. Yet, the highest level of environmental sustainability occurs in the group of the smallest EU farms.

Keywords: small farms, European Union, Poland, Common Agricultural Policy.

JEL codes: E2, E6, I2, Q1.

8.1. Introduction

The Common Agricultural Policy is one of the oldest policies of the EU. For over half a century, its operation has evolved and been reformed many times. However, the assumptions behind this policy are just as relevant today. The first steps to modify the CAP were Mac Sharry's reform, which moved toward greater care for the environment and established agriculture as a provider of public goods. The next step was the 'Revival of Rural Areas' declaration of 1996, which contained postulates for sustainable rural development and cited the need to include environmental issues in strategies for European rural development. Agenda 2000 [Duer 2000] erected the second pillar of the CAP to shift the emphasis of European agricultural policy toward the sustainability and multi-functionality of agriculture and rural areas [Czyżewski and Matuszczak 2016]. These stages are inseparable from the creation of the so-called European Model of Agriculture. Family farming underpins the concept of this model, which was articulated at the 1997 European Council in Luxembourg [Davidova and Thomson 2014]. It was assumed then that family farms are a key element of the European Model of Agriculture, in which agriculture is considered in relation to the surrounding rural environment. The authors of various scientific studies agree that sustainable development of agriculture requires including small family farms in market processes. Agricultural policy should strive to ensure that changing domestic and global demand is increasingly met by small farms and local enterprises rather than by global corporations. It is small farms and local companies that have more potential for sustainable development, not only at an economic level but also at social and environmental levels. And a balance must be achieved between these levels.

The problem of including small structures in a sustainable model of agriculture is global, but its cradle is the countries of Central and Eastern Europe and West Asia (the former republics of the USSR). The agricultural traditions in these countries are centuries-old, but there has been a historical attempt to help them change from a socialist economy to a market economy. During one decade (1989–2000) millions of small farms (over 2 million in Poland alone; currently there are about 1 million) found themselves in a new market reality. International corporations began to take control of food supply chains aggressively. Central and Eastern Europe and any republics of the USSR are therefore a kind of testing

ground for agricultural economics because there is no other region in the world where systemic changes would force almost simultaneous and equally targeted adjustments of the structures of production in so many countries. Therefore, the experience of these countries may be crucial for developing small farms wherever they struggle with the problem of marketisation of agriculture, such as in Africa and East Asia. If we consider a small household is one that sells less than 50% of its production, while the remaining part is consumed by the household itself, there are over 6 million of such entities in the EU-28. Of these, 90% are in the new member states of Central and Eastern Europe (60% in Romania, approx. 15% in Poland and Hungary, 100,000 each in Bulgaria and Lithuania and 9% in Italy). In recent years, many types of documents aimed at pro-environmental activities for small farms.

Despite the growing awareness of the role of small farms in sustainable development, the CAP offers only a few programs that concern these entities. They are, inter alia, the action ‘Supporting semi-subsistence farms’ in the programming periods 2004–2006 and 2014–2020, and the so-called ‘System for small farms’ in the period 2014–2020, which assumed a flat-rate payment for a farm (the so-called ‘lump sum’). This reasoning suggests that the pro-environmental components of the CAP also are addressed, though not directly, to small entities. The impact of the CAP on the productivity of these farms also is crucial. The positive impact of subsidies suggests that the integration of these farms in market processes will be easier and faster. Therefore, the purpose of this publication is to determine the impact of the CAP on the development of small farms in the EU, with a particular focus on Poland.

8.2. Support for agri-environmental projects in 2004–2020

In the literature, a consensus has emerged about the need to change the industrial and technological patterns that dominate commodity agriculture to sustainable development. There is an objective need to balance economic, demographic, spatial, environmental and social orders in a way that minimises the error of submission. The mechanism that stimulates the technical efficiency of production, without internalising the associated transaction costs that limit the well-being of the natural environment, must change [Zegar 2012].

Stimulating the scale of agricultural production in conditions of a reduction in unit purchase prices, and thus a relative reduction in the marginal income of farmers becomes economically meaningless. Adding to this the growing production costs, because of the need to pay a pension for natural well-being, the need to introduce a policy of permanently sustainable growth becomes necessary [Czyżewski A. and Czyżewski B. 2015]. People's well-being needs not only alimentation but also the natural environment. There is increasing public opposition to the eutrophication of waters, land dripping, elimination of green belts, and excessive methane and carbon dioxide emissions, especially in the areas of greater development. Therefore, the time has come to pay the universal ecological tribute, which might be understood as a special tax to preserve the natural environment for future generations. For now, however, the CAP places an increasing emphasis on programs that stimulate the delivery of environmental public goods. Agri-environmental and climate programs play a leading role among them. In Central and Eastern Europe, the obvious recipient should be small farms that have little competitive potential and low productivity, but that also exert relatively low environmental pressure. Therefore, meeting the requirements of agri-environmental programs in these entities requires relatively low outlays and alternative costs. In addition, because of market allocation mechanisms, these entities are generally in less-favoured areas. Therefore, payments to less-favoured areas (LFA) can also be seen as a kind of compensation for maintaining a certain status quo conducive to the environment. As results from Table 1 show, the growing importance of this type of support is not reflected in subsequent CAP budgets in Poland. The share of agri-environmental programs increased between 2007 and 2013 from approx. 6% to 9% of the RDP budget, but it did not change much in the next programming period. The share of LFA payments remains within the range of 16–26% of the RDP budget. Similar concerns may also be raised regarding the recipients of these payments, as only about 17% of these funds are allocated to small farms.

Table 1. Direct and indirect payments to small farms in the RDP budget in Poland and their allocation for small farms (up to 8 SO)

Activity	2004–2006	2007–2013	2014–2020	Estimated allocation of activities on small farms (up to 8 SO)
Support for semi-subsistence farms and Restructuring of small farms	9.48%	–	6.53%	100%
Agri-environmental and climate programs	5.80%	9.39%	8.76%	17.00%
Support for agricultural activities in less-favoured areas (LFA)	26.30%	9.94%	16.03%	16.93%
A system for small farms	–	–	3.15%	no data

Source: Data from the Ministry of Agriculture and Rural Development and Marcysiak & Marcysiak 2015.

This situation is even worse if you look at the share of broadly understood payments for public goods in all the subsidies given to an average farm in Poland compared to other EU countries (see Table 2).

Table 2. Payments for public goods as a share of total subsidies given to an average farm in EU-27 in 2004–2012*

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average
Austria	0.45	0.42	0.41	0.38	0.36	0.37	0.37	0.42	0.45	0.40
Belgium	0.08	0.06	0.06	0.07	0.08	0.09	0.08	0.08	0.09	0.07
Bulgaria	n.d.	n.d.	n.d.	0.00	0.02	0.06	0.11	0.06	0.06	0.06
Cyprus	0.00	0.11	0.12	0.11	0.04	0.09	0.16	0.11	0.26	0.11
Czech Republic	0.20	0.21	0.23	0.21	0.25	0.22	0.20	0.20	0.20	0.21
Denmark	0.10	0.04	0.04	0.03	0.04	0.04	0.04	0.05	0.03	0.04
Estonia	0.27	0.34	0.29	0.29	0.22	0.24	0.30	0.25	0.25	0.27

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average
Finland	0.40	0.45	0.39	0.43	0.43	0.37	0.37	0.38	0.40	0.40
France	0.14	0.15	0.09	0.09	0.08	0.09	0.08	0.09	0.09	0.10
Germany	0.19	0.13	0.12	0.10	0.10	0.09	0.10	0.11	0.11	0.11
Greece	0.09	0.17	0.18	0.17	0.20	0.22	0.17	0.16	0.09	0.16
Hungary	0.00	0.13	0.12	0.14	0.17	0.14	0.20	0.24	0.22	0.11
Ireland	0.22	0.22	0.25	0.24	0.22	0.18	0.22	0.23	0.21	0.22
Italy	0.07	0.10	0.07	0.07	0.08	0.11	0.09	0.09	0.11	0.09
Latvia	0.14	0.13	0.14	0.19	0.14	0.15	0.16	0.10	0.16	0.14
Lithuania	0.13	0.13	0.08	0.11	0.13	0.10	0.09	0.08	0.10	0.10
Luxembourg	0.35	0.33	0.33	0.32	0.31	0.28	0.25	0.28	0.24	0.30
Malta	0.30	0.06	0.18	0.28	0.23	0.14	0.12	0.11	0.14	0.16
Netherlands	0.15	0.14	0.14	0.10	0.12	0.12	0.12	0.15	0.14	0.13
Poland	0.00	0.06	0.10	0.09	0.10	0.08	0.10	0.08	0.08	0.06
Portugal	0.19	0.19	0.19	0.19	0.18	0.11	0.08	0.11	0.11	0.14
Romania	n.d.	n.d.	n.d.	0.00	0.001	0.01	0.006	0.18	0.07	0.02
Slovakia	0.36	0.38	0.39	0.40	0.38	0.36	0.31	0.25	0.27	0.34
Slovenia	0.23	0.42	0.24	0.32	0.26	0.33	0.27	0.25	0.32	0.29
Spain	0.07	0.09	0.05	0.04	0.07	0.05	0.06	0.06	0.07	0.06
Sweden	0.32	0.29	0.27	0.31	0.24	0.25	0.30	0.30	0.32	0.29
UK	0.16	0.12	0.17	0.21	0.19	0.18	0.18	0.18	0.19	0.18

*For Bulgaria and Romania 2007–2012

Source: Czyżewski and Matuszczak 2016 a and b.

It was expected that, during the discussions and ongoing reforms of the CAP, this share in total subsidies would systematically increase. The reality turned out to be different, as the postulates related to the pro-environmental and multi-functional orientation of the CAP were only declarative. In most EU countries,

the level of these payments remains relatively stable, while in others it often drops. The largest share of subsidies for public goods is recorded in Austria and Finland (approx. 40% in total subsidies). In these countries, traditional agriculture clearly shrinks because of unfavourable terrain, and thus lower profitability of agricultural production in favour of ecological production, delivery of public goods and development of multi-functionality of rural areas. The subsidies are considerable, although also falling, in Slovakia and Luxembourg (34% and 30% on average), and in Slovenia and Sweden (29% on average). The lowest share of these payments occurs in Denmark (4%), Spain and Poland (6%) and Belgium (7%), where favourable production conditions compete successfully with the implementation of non-agricultural functions in rural areas. The case of France and Germany also is interesting. They are two of the largest agricultural producers in the EU, yet the share of payments for public goods in total subsidies decreases over the considered period—from 14% to 9% and from 19% to 11% respectively. It can be assumed that the stream of subsidies related to public goods does not substitute for other payments and related production activities. Data in Table 2 indicate that the use of payments for public goods is not more common in the ‘old’ EU-15 member countries than in the EU-12, although Romania, Bulgaria and Poland do not use their possibilities in this respect.

To sum up, small farms in Poland primarily benefit from area payments, while programs addressed to this group of farms, in particular, have rather marginal significance. Therefore, there is doubt whether the CAP allocates subsidies properly, bearing in mind the growing importance of environmental objectives, but also social balance.

8.3. Assessment of the impact of the CAP subsidies on environmental sustainability

According to the declarations of the European Commission, for over a dozen years a pro-environmental and multifunctional orientation of the CAP has been called for. As previously mentioned, the CAP may affect the creation of environmental public goods through a package of agri-environmental programs, under which we can distinguish agri-environmental subsidies (SE621), subsidies to less-

-favoured areas (LFA) (SE622), other subsidies for rural development¹ (SE623) and set-aside subsidies (SE612). These activities should translate into a higher level of environmental sustainability of farms, which may be manifested, *inter alia*, in lower stock density per ha (SE120), lower fertilisation capacity of plant production (SE295/SE136), lower consumption of plant protection products for plant production (SE300/SE136), lower energy consumption in total production (SE345/SE131), higher forest area per ha of UAA² (SE075/SE025). These variables are among the considerations of environmental sustainability of agriculture in the literature [Latruffe et al. 2016]. Variables (indicators) have been reformulated to be stimulants of environmental sustainability. On this basis, a simple synthetic indicator (a composite index of environmental sustainability) was built for the average EUFADN farm³ on a regional level, using the proven Hellwig method.⁴

When considering the level of environmental sustainability of farms, taking into account their economic strength for the EUFADN farm panel, we note that smallest farms (class I) have the highest level, which is almost three times as high as for very large farms (class VI) (see Fig. 1). Wrzaszcz [2013] made similar observations in Poland and noted that the largest farms threaten the natural environment the most.

¹ Subsidies for adapting farms to EU standards, for agricultural advisory services, subsidies for improving the quality of agricultural products, for training, for afforestation and for maintaining the ecological balance of the forest environment.

² UAA – utilised agricultural area.

³ Farm participating in the EU agricultural accounting system called FADN (Farm Accountancy Data Network).

⁴ The Hellwig method is often used for hierarchizing the level of a phenomenon (usually development, but not only) that occur in the examined objects (cf. Ostasiewicz 1998; Stec 2015; Łogwiniuk 2011; Matuszczak 2013; Poczta-Wajda 2016).

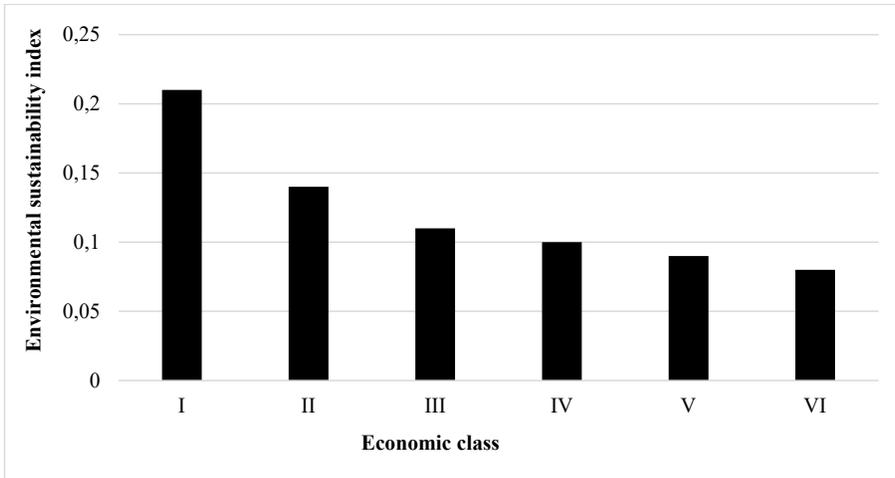


Figure 1. Environmental sustainability index on EU farms by economic size (2004–2013, average); synthetic index according to Hellwig method.

Source: own study based on EUFADN 2019.

A synthetic indicator of environmental sustainability for small farms in selected EU countries and regions is shown in Figures 2 and 3. In the group of very small farms (€2000–8000) the most environmentally sustainable were Slovenia, Malta, Portugal, and Bulgaria; the least were Hungary, Poland, Ireland, Lithuania and Croatia. Among small farms (€8000–25000) the highest sustainability was noticed in Slovenia, Malta, Austria, Italy, Portugal, the lowest in Great Britain, Sweden, Finland, the Czech Republic, Ireland, Slovakia, and Croatia.

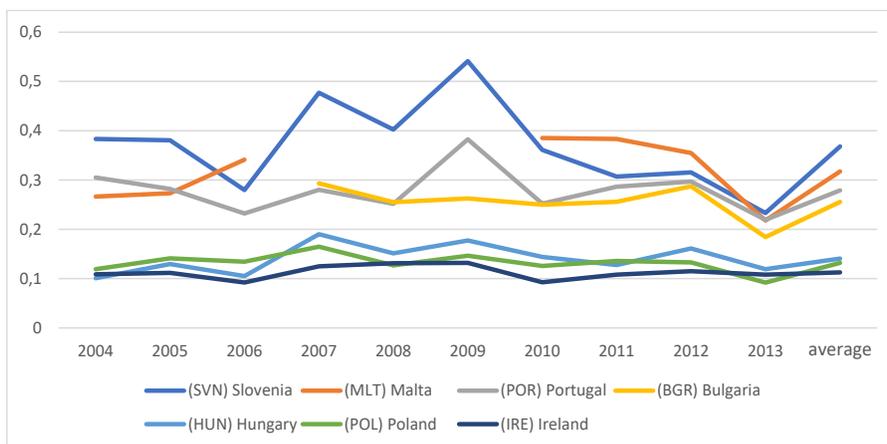


Figure 2. Environmental sustainability indicator in very small farms (€2000–8000) in selected EU countries in 2004–2013 (synthetic index according to Hellwig method).

Source: own study based on EUFADN 2019.

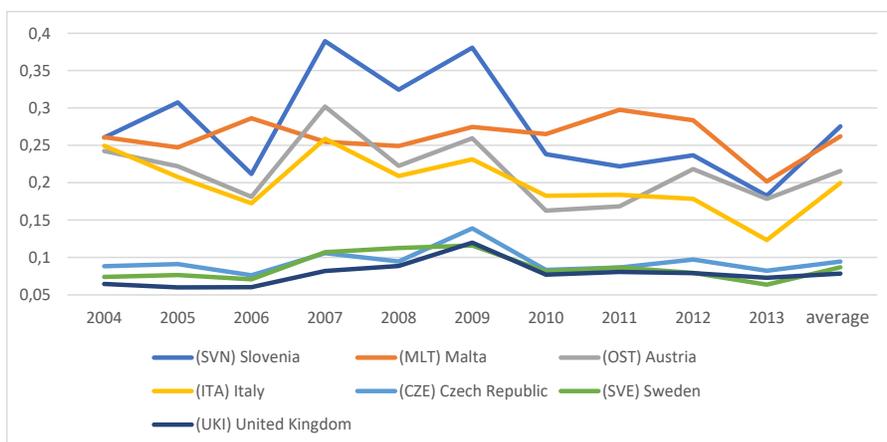


Figure 3. Environmental sustainability indicator in small farms (€8000–25000) in selected EU countries in 2004–2013 (synthetic index according to Hellwig method).

Source: own study based on EUFADN 2019.

Then, the panel regression model of CAP subsidies per ha UAA and environmental sustainability index were estimated [for more see Czyżewski et al. 2018].

Table 3. Impact of the CAP subsidies on environmental sustainability

Fixed effects, 1253 observations, 132 cross-sectional data units, dependent variable (Y): environmental sustainability index, Beck-Katz standard errors

Explanatory variables EUFADN codes	Regression coefficient	p-value
<i>Constans</i>	0.156972	<0.0001
Support_Art68 SE650	0.0010755	<0.0001
Subsidies on external factors SE626	0.00100765	<0.0001
Other livestock subsidies SE61	5.29904e-05	0.0453
Subsidies on investment SE406	0.000281983	<0.0001
Subsidies on intermediate cons. SE625	0.000398663	0.0090
LFA subsidies SE622	0.000192942	0.0059
Single Farm payment SE631	-0.000193055	<0.0001
Subsidies Rother cattle SE617	-0.000221657	0.0001
Environmental subsidies SE621	9.67112e-05	0.1113
Single Area payment SE632	-0.000448764	<0.0001
Subsidies dairying SE616	-0.000284217	<0.0001
Set-aside Premium SE612	-0.0032908	<0.0001
Other rural development payment SE623	8.94636e-05	0.1353
Additional aid SE640	0.00399177	<0.0001
Other subsidies SE6991	0.000197754	0.0004
Arithmetic average of the dependent variable	0.138220	
LSDV R-square	0.537886	
Within R-square	0.369532	

Source: own calculations on the basis of EUFADN data using GRETL and STATA software, [see more at Czyżewski et al. 2018]

Based on the estimated model (Table 3) it is clear which groups of subsidies favour and harm environmental sustainability. Interestingly, there are two groups of subsidies that make a positive impact. First, there are subsidies that support productivity broadly understood and reduce labour intensity (investment subsidies, intermediate consumption and external factors). Second, as expected, are the subsidies for Less Favourite Areas (LFA), reallocation of savings from modulation (i.e. reduced support for the largest farms in favour of smaller ones), environmental subsidies and rural development support (SE623). The subsidies that exert a negative impact include the aforementioned single area/farm payments and support for animal production (dairy, sheep and goats), which was in line with expectations.

8.4. Impact of the CAP subsidies on farms productivity

In the previous paragraphs, two desirable directions for stimulating the development of small farms in the EU were identified. They are productivity broadly understood and provision of environmental public goods. The question is whether the tools used by the CAP can, in principle, be effective in realizing these functions. Admittedly, subsidies targeting small farms have a relatively small share in the CAP budget. However, small farms depend to a large extent on other subsidies. At this point, we present the results of panel regression, which allow us to see how individual CAP actions affect the technical productivity of farms.

Cluster analysis of the averages from the two previous programming periods has identified three groups of EUFADN regions that differ in models of agricultural support [Czyżewski 2017]. The support model used in all the countries of Central and Eastern Europe can be called medium balanced. In this group, support for agriculture was mainly carried out, as mentioned above, through payments to single farms and areas (over 50% of total subsidies). At the same time, farms from these countries benefited mostly from agri-environmental payments (nearly 17% share), set-aside payments, payments for less-favoured areas and for rural development.

In the panel regression model for this cluster, the explained variable is the productivity of intermediate consumption, and the explanatory variables—the full matrix of CAP subsidies—explains over 90% of the variability of productiv-

ity with the intra-group R^2 variance less than 20% (see Table 4). [Czyżewski et al. 2017; Czyżewski 2017]. A panel of time series (2007–2012) was examined for each of the 60 regions in this group, i.e. within R^2 assigns productivity variability to subsidies changing over time.

Table 4. Impact of the CAP subsidies on farms productivity

Fixed effects, 357 observations, 60 cross-sectional units, dependent variable: logarithm of intermediate consumption productivity without subsidies in 2007–2012, resistant Beck-Katz standard errors

Explanatory variables EUFADN codes	Regression coefficient	Standard error	Statistic z*	p-value
<i>Constans</i>	0.552186	0.0511908	10.7868	<0.0001
<i>Economic size</i>	0.00115674	0.00063528	1.8208	0.0737
<i>Subsidies on investment</i>	-8.97732e-06	5.12817e-06	-1.7506	0.0852
<i>Set-aside premiums</i>	-0.000848691	0.000401887	-2.1118	0.0390
<i>Other crop subsidies</i>	3.48189e-05	7.3805e-06	4.7177	<0.0001
<i>Subsidies other cattle</i>	-2.29505e-05	1.01412e-05	-2.2631	0.0273
<i>Subsidies sheep & goats</i>	9.07244e-05	3.80155e-05	2.3865	0.0202
<i>Other livestock subsidies</i>	-4.76956e-05	8.95212e-06	-5.3279	<0.0001
<i>Environmental subsidies</i>	2.49441e-05	5.42378e-06	4.5990	<0.0001
<i>LFA subsidies</i>	-3.10549e-05	1.33202e-05	-2.3314	0.0232
<i>Other subsidies</i>	-9.69108e-06	5.04416e-06	-1.9212	0.0595
<i>Subsidies on intermediate consumption</i>	-2.81006e-05	1.38462e-05	-2.0295	0.0469
<i>Single Farm payment</i>	-7.45402e-06	4.57004e-06	-1.6311	0.1082
<i>Single Area payment</i>	-1.02835e-05	4.7033e-06	-2.1864	0.0328
<i>Additional aid (till 2010)</i>	0.00037333	0.000133433	2.7979	0.0069

Explanatory variables EUFADN codes	Regression coefficient	Standard error	Statistic z*	p-value
<i>Support_Art68</i>	3.5304e-05	1.39287e-05	2.5346	0.0139
LSDV R-square 0.903102; <i>within</i> R-square 0.201075				

The variable names from the EUFADN database have been preserved, see http://ec.europa.eu/agriculture/rica/database/database_en.cfm, <http://fadn.pl/wp-content/uploads/2012/12/RICC-882-rev9.2-Definitions-of-Variables.pdf> (accessed 7.04.2017) *relation of regression coefficient to standard error

Source: Own study based on EUFADN data [Czyżewski et al. 2017; Czyżewski 2017]. Calculations were made in the GRETL 2016c program.

According to the literature, most CAP subsidies had a negative impact on productivity (calculated without subsidies). These results support the assumption that farms from the new member states are likely to spend a large proportion of decoupled payments on consumption or on investment projects that are not fully profitable. This can be seen in the negative impact of the single area payment on productivity. The negative impact of investment subsidies is quite surprising, although it may indicate overinvestment in farms in new member states, as pointed out by various authors [Grzelak 2014; Kowalski and Szelağ-Sikora 2006; Szeptycki 1996]. Moreover, it is likely that increases in productivity from investment needs more time. A separate analysis of the positive impact of subsidies on productivity in isolated cases is required, especially subsidies that may be relevant for small farms:

- subsidies for sheep and goat breeding and for products made from goat's and sheep's milk. This mechanism is essential for maintaining production in mountainous regions and regions where extensive grazing predominates. Support for products from goat's and sheep's milk may in this case also indirectly affect the productivity of intermediate stages of the processing chain;
- agri-environment subsidies, whose positive impact on productivity is quite surprising. It can be assumed that in the new member states, environmental criteria in this type of program are achieved at the outset, which allows them to raise funds for development without incurring additional costs. This is what the concept of the retirement pension is about [Czyżewski

et al. 2017]. In addition, there are also studies that show that, while pro-ecological activities create additional costs from enterprises, more stringent environmental requirements can stimulate innovation [Porter and Van der Linde 1995; DeSantis and Lasinio 2015].

8.5. Why is supporting the productivity of small farms ineffective?

Why is it difficult for small farms to exceed the performance threshold for faster development? The research problem, in this case, is to answer the question, how does the increase in productivity affect changes in income on farms from various economic classes. A measure of total TFP⁵ productivity was used in this analysis. To better understand the relationship between TFP and changes in income, a panel regression analysis of these variables was performed. Modelling was used to determine whether and to what extent the actual changes in the income of individual FADN farms resulted from changes in TFP productivity.

The regression coefficients estimated in this analysis are presented in Tables 4 and 5. They provide a clear basis to explain the main reason for the ineffectiveness of the policy supporting the productivity of small farms. Note especially the changes in regression coefficients when moving to higher SO classes. The first part of Tables 4 and 5 shows the marginal increase in income from an increase in productivity of €1. The second part of these tables shows the marginal decrease in income from a decrease in productivity of €1. It should be noted that when production declined—in the recession phase—a small farm lost more than a large farm on a *pro-rata* basis. That is, in I SO, a decline in TFP of €1 resulted in a decrease in income of €1.18. We should add that changes in TFP explained in this case as much as 81% of income changes – compare Table 5.

For small entities, the market mechanism works in two ways to demotivate. The farm earns less than expected by increasing productivity and loses more than expected by reducing production capacity during the recession. Therefore,

⁵ Total factor productivity (TFP), also called multi-factor productivity, is a measure of productivity calculated by dividing economy-wide total production by the weighted average of inputs i.e. labour and capital. It represents growth in real output which is in excess of the growth in inputs such as labour and capital (TFP = total product/weighted average of inputs).

balancing between insurance and the desire to make a profit, a safer strategy would be stagnation (lack of development). On the other hand, the desire to develop makes the household more and more dependent on the market treadmill. To achieve a higher income growth rate, it falls into a vicious cycle of increases and decreases in productivity.

Table 5. Impact of increase and decrease in productivity on agricultural entrepreneurial income in the EU-15 in 2004–2012: panel regression coefficients in euros per €1 increase or decrease in productivity (linear model)

SO Classes	I	II	III	IV	V	VI
Positive income changes due to increased productivity						
Number of Observations	18	41	61	60	68	37
Constants	384.81 (0.0277)*	2321.18 (0.1109)	3045.59 (0.0002)	6125.24 (<0.0001)	9119.2 (<0.0001)	41574.7 (0.0028)
TFP change factor	0.674926 (<0.0001)	0.520189 (0.0068)	0.707906 (<0.0001)	0.335224 (<0.0001)	0.147582 (0.0032)	0.218704 (0.0101)
LSDV R2	0.743492	0.132345	0.593515	0.522639	0.037207	0.228404
Negative income changes due to decreased productivity						
Number of Observations	21	39	59	60	52	37
Constant	-65.3578 (0.6717)	-1284.12 (0.0098)	-2816.38 (<0.0001)	-3740.49 (0.0122)	-11523.7 (<0.0001)	-42830.4 (<0.0001)
Regression coefficient	1.18425 (0.0039)	0.564522 (<0.0001)	0.476127 (<0.0001)	0.459618 (0.0606)	0.233245 (0.0022)	0.164364 (0.0693)
LSDV R2	0.810945	0.843160	0.546416	0.329658	0.135566	0.137917

* p values in brackets

Source: own study based on Eurostat 2019 and EUFADN 2019.

Table 6. Impact of increase and decrease in productivity on agricultural entrepreneurial income in EU-12 in 2004–2012: regression coefficients in euros per €1 of excess productivity (linear model)

SO classes:	I	II	III	IV	V	VI
Positive income changes due to increased productivity						
Number of Observations	32	38	45	48	47	35
Constant	506.131 0.0036	1156.45 0.0004	3015.68 0.0005	7175.25 0.0008	20539 <0.0001	90124.2 0.0006
Regression coefficient	0.587273 (0.0007)	0.514073 (0.0009)	0.645047 (0.0006)	0.387791 (0.0292)	0.26502 0.0525	0.601849 (0.0064)
LSDV R2	0.534319	0.397822	0.541645	0.238200	0.109258	0.579254
Negative income changes due to decreased productivity						
Number of Observations	26	44	45	42	43	29
Constant	-262.711 0.1398	-1146.67 <0.0001	-3057.37 <0.0001	-7297.56 <0.0001	-20695.8 0.0022	-99620.7 <0.0001
Regression coefficient	0.895959 (0.0033)	0.2666 (0.0410)	0.514857 (0.0003)	0.463047 (0.0046)	0.255337 0.1931	0.569842 (0.0050)
LSDV R2	0.697943	0.154367	0.425217	0.294162	0.080960	0.487947

p values in brackets

Source: own study based on Eurostat 2019 and EUFADN 2019.

8.6. Support for semi-subsistence farms in Poland

At the end of the analysis, CAP programs were analysed, which can be said to have been directly addressed to small farms. For this purpose, we used data for Poland. After Poland's accession to the European Union in 2004, small farms began to receive support under the CAP action 'Supporting semi-subsistence farms'. 157,656 farms received help. These funds made up 9.48% of the RDP budget for 2004–2006. Very small farms with SO value up to €8,000 applied for help. (up to 4 ESU). There were over 950,000, and their share of the total

number of farms was 66.3%. They used approximately 24% of arable land, and 50.7% of people those employed in agriculture were associated with these small farms [Ziętara 2015]. From a formal point of view, agricultural producers running farms with an economic size of 2 to 4 ESU in the three years before the application was submitted were entitled to support in this measure. The aid consisted of a bonus equivalent to €1,250 per year for 5 years. The condition for getting support was the farmer's commitment to restructuring the farm by implementing the assumptions in the semi-subsistence farm development plan. As a result, 157,656 applications (or 91.2%) were approved, but only 57.1% of them achieved the adopted goals. The most popular projects were: purchase of agricultural machinery (46.3%), purchase of farm animals (29%) and purchase or lease of land (11.7%) and their share was about 87%. To sum up, semi-subsistence farms received PLN 3,446,598.1 thousand in support during this programming period. The average amount of support per beneficiary was PLN 21.8 thousand [Ziętara 2015].

In the current 2014–2020 perspective, CAP support is re-envisaged under similar conditions, but with nearly 2.5 times the amount of funding. This pool of funds makes up 6.53% of the RDP budget for 2014–2020 [RDP 2014–2020, December 2014]. On February 19, 2019, the Minister of Agriculture and Rural Development initiated the amendment to the Regulation of the Minister of Agriculture and Rural Development of 2015 regarding the detailed conditions and procedures for granting financial aid under the measure 'Restructuring small farms' under the sub-measure 'Aid for starting business activity for developing small farms' covered by the Rural Development Program for 2014–2020 [Journal of Laws of 2015; item 1813; from 2016 item 1009; from 2018 item 868]. The document proposes that restructuring aid may be granted to a farmer who is a natural person who is an independent or dependent holder of a farm or real estate in the Republic of Poland, whose economic size is less than €13,000, not €10,000 as previously agreed. The intention is to provide direct support to farm owners who do not engage in gainful activities other than agricultural activities to help them increase the economic size of that farm.

The project mentioned above proposes also to abolish the requirement that farmers be subject to social insurance and that the profitability of the applicant's agricultural activity is based on profitability or income (income or revenue of at least 25% relative to the total income or revenue, respectively). The provisions

regarding the ownership structure of applicants' holdings also are to be relaxed. The current regulation requires that the arable land of the beneficiary, perpetual usufruct or lease must make up at least 70% of the area of the farm when calculating the target size. The draft proposes to reduce this requirement to 50% (FAPA 2019). The overarching goal of the measure in the 2004–2006 period was to provide beneficiaries with a temporary increase in farm income. According to Ziętara [2015], although this goal was achieved on an ad hoc basis, this action did not cause structural changes. For this reason, it was not included in the 2007–2013 programming period.

For 'The system for small farms' in the 2014–2020 period, Poland chose to make payments to a farm equal to the sum of EU payments that would be granted to this farmer in the standard system (calculated annually, based on current data), but not greater than €1,250. Under such conditions, more than half of direct support beneficiaries managing 2.2 million ha of land are participating in the system for small farms. Nevertheless, farmers participating in this system do not receive any additional aid compared to the support they would receive in the standard system. Thus, the only advantage of participation is to be exempt from agricultural practices that are beneficial for the climate and the environment, in particular: diversification of crops, creation of ecological focus areas and maintenance of permanent grassland [Sadłowski 2017].

8.7. Conclusions

The instruments of the Common Agricultural Policy influence the direction of development of European agriculture. One of the current and most important priorities is supporting the development of sustainable agriculture. Small family farms, which according to the European Model of Agriculture are the foundation of European agriculture, play a special role in implementing this priority. These farms are predominantly in the new member states from Central and Eastern Europe. Sustainable agriculture development includes involving small family farms in market processes. Implementing this postulate would stimulate the productivity of small farms by the CAP. The results of the study showed that the market mechanism is demotivating for small farms. This is because small farms earn less than they intend when they increase productivity and lose more than

they average when production capacity declines, as it did during the recession. It is, therefore, worrying that research has shown that most CAP subsidies have a negative impact on productivity. Agri-environmental programs also play a special role in the development of small farms. Meeting the requirements of agri-environmental programs in these entities requires relatively low expenditure and an alternative cost. It has been shown that the highest level of environmental sustainability occurs on the smallest farms. This sustainability is almost three times as high as on very large farms. Therefore, the priority in the EU should be to use the capacity of these farms to increase environmental sustainability in the entire EU agricultural sector. Besides the instruments that indirectly affect the development of small farms in the EU, they are indirectly affected by the program: ‘Support for semi-subsistence farms’.

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Closing remarks

One of the key challenges facing the contemporary food economy is the choice of the trajectory of development in the agricultural sector. Quick and decisive actions are necessary in order to tackle this issue, especially in the face of impending threats regarding the natural environment and limited access to water and soil in many regions of the world. The issue of deprived farms remains unsolved, i.e. the issue of persistent disparity in agricultural and non-agricultural income in relation to the increasing average level of income in the economy. Based on ownership laws and demand-supply regulations, the economy shapes the demand for money. In reality, this leads to the concentration of production and results in lower production costs from the perspective of microeconomics. When combined with technological development, this results in an increase in agricultural production in conditions of declining food prices. Large industrial farms which, as a result of scale effect, become more effective in the microeconomic sense, are the main beneficiaries of this process. This, however, occurs under the conditions of minimal requirements regarding food quality, animal welfare, and natural environment protection. For the traditional small-scale family farms, the average income is significantly lower than that for those engaged in non-agricultural activities. This disproportion is increased by the rise of a growing number of processing and marketing corporations, which compete against each other by offering lower product prices. The phenomenon described above is becoming more and more prevalent in the conditions of globalisation and a developing world economy. As a result of mergers and takeovers in the food industry, the conditions of farms change, resulting in their further depreciation. Globalisation gives rise to an economy which moves with increased speed in the direction of microeconomic (corporate) efficiency; however, by virtue of being based on the principle of efficiency, it not only does not solve the income gap problem, but also begets many other social and environmental problems.

It can be, therefore, assumed that the industrial-technical blueprint for the functioning of the agricultural sector has reached the boundaries of growth and it has become necessary to reorient it with the aim of achieving equilibrium in the market. The mechanism, which managed to stimulate efficient production so far, is becoming obsolete. How long can one aim at an increase in capital efficiency with the goal of maximizing profit, when, at the same time, important social and environmental problems are being neglected? The triumph of the, so called, ‘technological treadmill’ is over; now, it is time to change our approach to the land factor and to look at the ramifications of our endeavors through the prism of the incumbent social and environmental consequences: for instance, the already-mentioned deprivation of small and medium farms, which sustains the disparity between the living conditions of people engaged in agricultural and non-agricultural activities, and, as a result, leads to the depopulation of the countryside. The environmental issues include the problem of soil degradation, increased emission of carbon dioxide, eutrophication, steppe formation etc. In the light of the above-mentioned problems, one has to admit, that the model of sustainable development is a viable alternative for the industrial agriculture model. It shifts our perception of the individual from *homo oeconomicus* to *homo cooperativus*, a human being oriented towards cooperation with the aim of achieving a common goal. A balanced agriculture can constitute a chance for the improvement of the quality of life in the countryside, taking into account the component of economy (the creating of income for agricultural producers), the social aspect (a guarantee of employment, landscape assets), the environmental aspect (biodiversity, as well as soil, air and water quality), and cultural factors (traditions and customs). Small-scale family farms are its inseparable element. Exceeding other types of business endeavors in their ability to counteract the effects of large-scale production, concentration of land and biodiversity. They also promote ecological stability and better quality of food. They constitute a buffer, a shield protecting against poverty in the countryside. Beyond that, they also help to sustain intangible assets, such as cultural and historical values. They are, therefore, a necessary prerequisite for the future development of the countryside, even if, from the point of view of microeconomics, their existence seems to be unjustified. The microeconomic criterion is, however, rather myopic, because the long-term costs of liquidation of these kinds of subjects would be enormous, both from a economical and socio-environmental perspective.

The purpose of this monograph, was to point out the function of small farms in eastern-European countries. Although, due to the various differences between the countries included in the analysis, the establishment of common, universal conclusions is a difficult task. There is also a lack of a shared definition of a small farm; there are also no commonly shared criteria for defining a small farm. Nevertheless, a common feature of these regions (besides the Czech Republic) is the defragmentation of agriculture (fragmented agriculture) and a high degree of involvement of farms with a small area of agricultural land and small marketisation, despite the advancements in the process of consolidating areas. In the ownership structure, economically weaker entities dominate the market; as a consequence of that, a gap emerges between the agrarian and non-agrarian sector. However, in all of the countries under investigation, the role of small farms is emphasised as being of crucial importance when aiming at achieving a balanced agrarian sector. Even in the Czech Republic, where the structure of farms is more similar to that of the USA than to that of middle-eastern Europe, one can notice the need to maintain the function of small-scale farms. The authors of subsequent chapters maintain that small-scale family farms sustain the vitality of rural areas and stimulating the local economy, delivering a wide array of public goods, from the ones related to the provision of quality food, promotion of biodiversity and environmental protection, to those related to the maintenance of customs and cultural legacies, and even landscapes. On the other hand, there are negative assessments regarding the low profitability of these entities, a small impact on technical progress, implementation of innovations, creation of new solutions, etc. In this sense, the market competitiveness of small-scale farms is relatively low compared to large-scale agriculture. Adopting, however, only such a criterion is, according to the authors, a great simplification, because it disregards other non-economic functions that agricultural holdings perform.

The above-mentioned points should constitute an argument to support the sector of small, family farms, even if not bolstered by microeconomic reasons. Meanwhile, the current support mechanisms appear to be inadequate, what it turn leads to the deprivation of small-scale farms in favour of large-scale farms. The dearth of viable solutions regarding intervention policies is particularly apparent in the case of Serbia and Moldavia, two countries from outside the European Union. Poland, Romania, Latvia and the Czech Republic are all encompassed by instruments of a shared agrarian policy, what allows to utilise a part of the

budget for purposes related to a balanced form of development. Our experience indicates that, from various forms of support available to the small farms, the most useful are the following: agrienvironmental programs, decoupled area payments and special, dedicated programs, such as ‘Support for semi-subsistence farms’. However, market instruments and instruments stimulating the productivity of farms play a much smaller role. In the future, solutions connected directly with the provision of public goods should also be taken into account, such as, e.g. payments for preventing soil erosion, increasing carbon sequestration, reduction in the use of chemical fertilisers and pesticides, mitigating the effects of climate change, etc. Ventures related to the local systems of sales and distribution, traditional farm products, short-supply chains and also non-agrarian activities should be supported.

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