Selected determinants of social polarisation and economic stability in rural areas and in agriculture

INSTITUTE OF AGRICULTURAL
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Selected determinants of social polarisation and economic stability in rural areas and in agriculture

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The purpose of the study was to assess the areas of smart specialisations in Polish regions in the context of agricultural and rural development as well as to analyse the significance of production factors in determining a market activity of agricultural holdings.

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Contents

Foreword

Rural areas in Poland cover 90% of the country. Over 15 million people (nearly 40% of the population of Poland) live in the villages. The accession to the EU affected socio-economic situation of rural dwellers significantly. In the past two decades the changes in lifestyles were accompanied by the development of information and communications technologies. Moreover, the level of education and the life-expectancy indicators have improved. The contribution of agricultural sector, which employs only a certain number of people to the rural and domestic economy has decreased. Above mentioned changes were important for a general social change in the Polish countryside.

Rural areas underwent significant and multidirectional transformations. The Polish countryside have always been characterised by economic, social and cultural diversity. The two basic directions of changes could be distinguished. On the one hand, the villeges were "catching up with the cities". On the other hand, the cities were "moving" to the countryside. Economic progress of agricultural holdings, development of their new social and environmental functions, the urbanisation process as well as popularisation of urban lifestyle, changed rural areas and local communities. However, despite the significant improvement, there are still different gaps. They concern mainly the level of development of technical and social infrastructure, as well as the standard of living [Terziev, Bencheva, Stoeva 2016].

An important resource of rural areas is the social capital and institutions. Nowadays, the contribution of socio-cultural phenomena to the economic growth is noted increasingly. The institutionalism theorists perceived the economic development in a similar manner. The informal activities and legal rules of economic life are always embedded in the social environment. The commonly shared values and cultural practices shape the world of economic organisations. Douglas North – a representative of institutionalism, treats institutions as the game rules, which limit the activities of an individual. In North's opinion, institutions are restrictions made up by people and structuring human relationships. In other words, we may conclude that the more active people are, the more they support the development process.

In the rural environment, social organisations have always played a special role. Different activities aimed at meeting the needs of local comunities often went beyond formal actions and objectives for which a given organisation was established. **The first chapter** of presented monograph analyses the changes in the social activity of the rural population after Poland's accession to the EU, particularily the participation in election. This part also describes the local

authorities and characterises the level of institutional and overall trust of rural dwellers. This part of the book was primary based on the empirical material gathered by the Institute of Agricultural and Food Economics-National Research Institute (IAFE-NRI) panel surveys. This surveys provided the comprehensive information, *inter alia* on the social activity within the local communities and the living standards of rural population.

An important role in socio-economic changes in rural areas plays the innovations. Currently, much attention to the issue of rural economic progress is devoted. This is reflected in the EU cohesion policy changes, which focus on the activation and support of the development of new technologies, economic, social and environmental solutions in member states and regions. An instrument of the new EU policy is smart specialization, i.e. investment priorities defined by individual states and regions. **Chapter two** of this monograph defines the term of smart specialization and describes the premises of its introduction into EU policy. Furthermore, it characterises selected critical remarks concerning this concept, in particular those linked with limitations and risks of the application in rural and agricultural regions. The second part of the chapter two focuses on national and regional smart specializations in Poland. Identified specializations were described and evaluated mainly from the perspective of rural and agricultural development.

Social and institutional changes in rural areas and the improvement of economic structures of agricultural holdings result in the changes in the Polish countryside. Poland's accession to the EU and the related modernization of agriculture, contributed to a certain improvement of the relation between production factor resources and the economic effects thereof, however, the distance between Polish agriculture and that of other EU states is still considerable. The purpose of **the chapter three** was to analyse the changes in production factor resources and their mutual relationships, from the perspective of the entire Polish agriculture, and that of individual groups of farms, according to their market activity.

The publication was prepared within the Multi-Annual Programme 2015--2019 entitled *The Polish and the EU agricultures 2020+. Challenges, chances, threats, proposals* and the research topic number two: ***Social polarization versus economic stability in the development processes of agriculture and rural areas***. The analysis presented in this volume concerned two research tasks: ***Mechanisms leading to overcoming structural barriers in the development of family farms and rural areas*** and ***Defining the rural and agricultural policies in the conditions of transformation of the rural economy***.

Chapter 1
Selected directions of social transformations in rural areas in Poland

1.1. Introduction

1.1.1. Exit from agriculture by the rural population

Structural transformations in Polish agriculture, including improvement in the agrarian structure of farms and the fact that agriculture does not provide a sufficient number of jobs, affect not only changes in the directions of activities of individual holdings and the outflow of the workforce to non-agricultural sectors [Zegar 2009, Chmielewska 2013], but also translate into a series of changes and social problems. Processes of concentration in the agricultural sector, phenomena of migration and accessibility to the urban labour market affect the scale of changes both in the rural settlement network and the connection of the rural population with agricultural holdings [Sikorska 2013]. Technological progress in agriculture, change in the nature of Polish farms and increase in the diversification of the professional activity of the farming population contributed to a significant decline in agricultural employment. At the same time, agricultural employment, in own agricultural holding, does not provide work for all willing to work. From the survey data it results that even in a group of agricultural holding managers, in 2011 about two-thirds of them worked only in agricultural holdings, the others combined work in holdings with non-agricultural employment (Table 1.1).

Table 1.1. Employment of agricultural holding managers

year	exclusively on farm	exclusively off-farm	on farm and off-farm
men			
2000	64.5	2.3	33.2
2005	60.2	1.9	37.9
2011	63.0	*	37.0
women			
2000	72.9	3.2	23.9
2005	67.3	2.7	30.0
2011	*67.6*	*	*32.4*

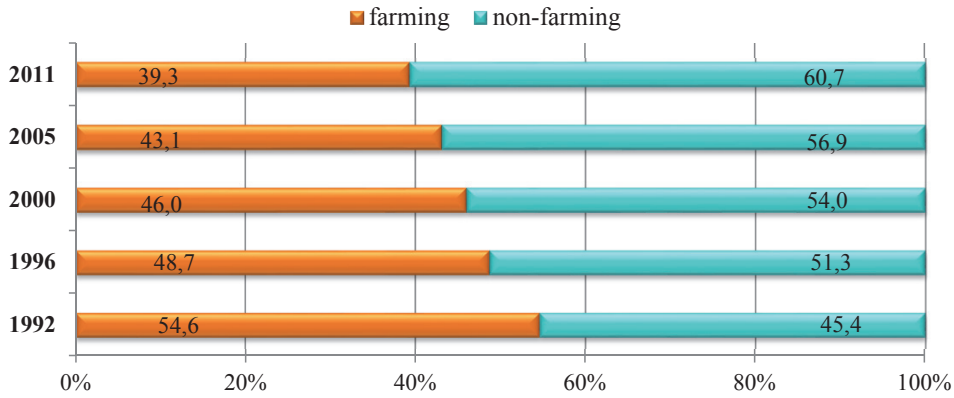
Source: IAFE-NRI surveys 2000-2011.

It is necessary to stress the fact that in the past rural women (women farmers) rarely got employed outside the farm, it was the men who made use of a possibility of non-agricultural employment [Wrzochalska 2006, 2013]. The data show that nearly one third of women combine working as farm managers

with working outside agriculture. Moreover, rural women in Poland do not give up their ambition and work outside of their holdings. Therefore, the progressive process of unification of attitudes between rural men and women takes place.

In 2005-2011, the population of the surveyed villages decreased by about 6%. This resulted from, first of all, a clear decrease in the population from the farming families [Karwat-Woźniak, Sikorska 2013]. In the rural population, the percentage of the families not connected with agricultural holdings (non-farming population) for many years has been increasing systematically (Figure 1.1).

Figure 1.1. Changes in the percentage of the farming and non-farming families in rural areas in Poland



Source: IAFE-NRI surveys 1992-2011.

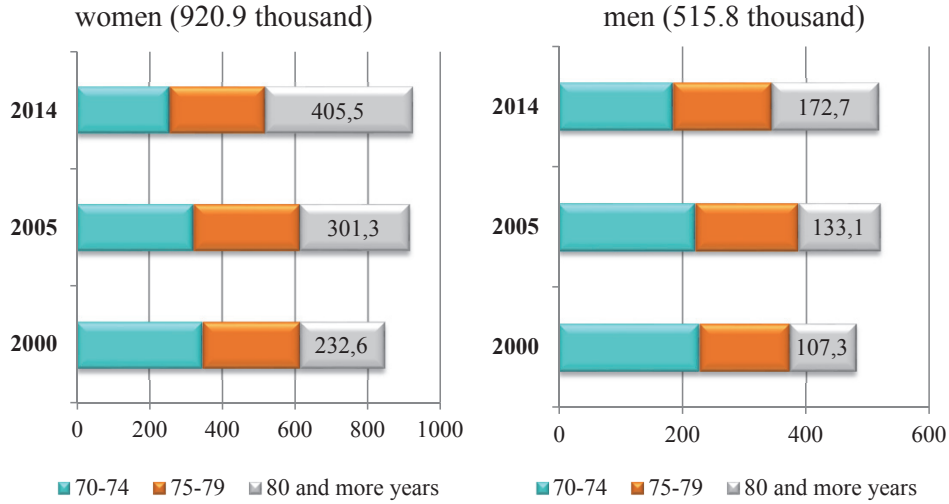
In 2011, the number of the non-farming rural families accounted for more than 60% of the total surveyed families and in relation to the year 2005 it increased by 3 percentage points (p.p.). When compared to the period from before the political transformation, this share has increased significantly, by as much as 20 p.p. The basic mechanisms of this process was the exiting of the rural population from agricultural activities and its professional activation in other branches of the economy or ceasing production activities due to reaching retirement age.

1.1.2. Ageing of the rural population

Another important process is the problem of the ageing of the rural population. The population aged 70 and more is significantly growing, including persons from the oldest age group, above 80 years. In particular, this applies to a group of rural women. According to the CSO data, in 2014, rural areas were inhabited by nearly 1.5 million persons aged 70 and more and persons above 80 accounted for nearly 600 thousand (Figure 1.2). Therefore, there is a need not

only to provide care, especially to the lonely and sick, but also to take measures to include a relatively large group of the elderly into the social life of the countryside and thus to make use of their potential.

Figure 1.2. Number of persons aged 70 and more in rural areas, by sex (in thousand)



Source: own elaboration based on the CSO data.

1.1.3. Changes in the level of education in the rural areas

Just like in cities, the process of improving the level of education has become visible in the rural areas. It should be stressed that the relatively more positive changes in this area have been recorded in the community of the farming families (Table 1.2), and in the group of rural women (Table 1.3). In general, the convention under which persons staying in agriculture are those with the lower level of education or those who have no chance to change their professional activity has been overcome. In particular, the percentage of persons with the higher and secondary level of education has increased. Rural women have particular ambition in striving for achieving educational success.

According to the surveys, the percentage of women with higher education is almost twice higher than that of men. The rural population improves their qualifications at the various courses. Almost every fifth village organised agricultural and non-agricultural training courses and every tenth village – specialised courses [Dudek, Wrzochalska 2015]. However, in rural areas there are limited non-agricultural employment opportunities, especially for persons with higher education, in particular, rural women have relatively little chance.

Table 1.2. Level of education of persons from rural families (in %)

year	higher	secondary and post-secondary	vocational	lower secondary and primary
non-farming families				
2000	3.6	18.1	38.8	39.5
2005	5.3	22.5	36.1	36.1
2011	11.1	29.1	33.1	26.8
farming families				
2000	2.1	17.0	39.2	41.7
2005	5.0	23.2	37.4	34.4
2011	12.3	32.1	30.7	24.9

Source: IAFE-NRI surveys 2000-2011.

Table 1.3. Level of education of the population in rural areas, by sex (in %)

higher master's degree	higher bachelor's degree	secondary and post-secondary	vocational	lower secondary and primary
men				
5.2	3.9	28.3	38.0	24.7
women				
8.2	5.3	32.9	24.7	30.7

Source: IAFE-NRI survey 2011.

1.2. Changes in the equipment of rural households with technical and sanitary installations and selected durable goods

1.2.1. Equipment of households with technical and sanitary installations

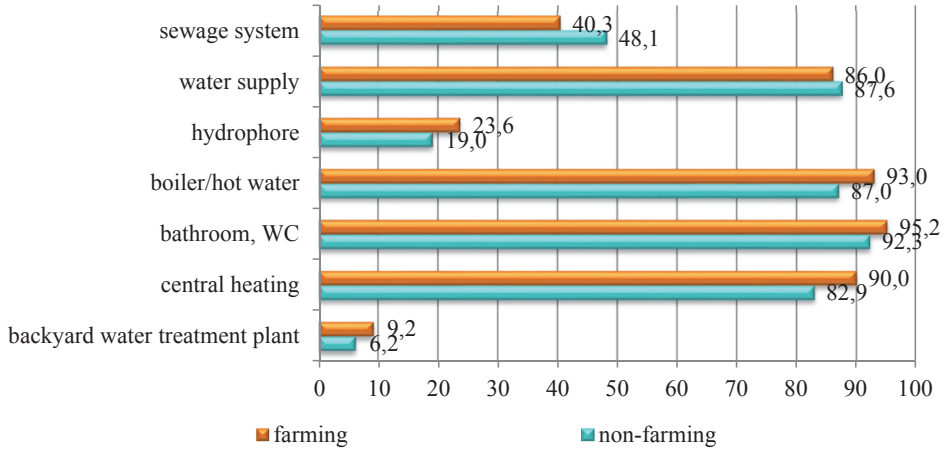
From the surveys it results that in 2011 (when compared to 2005), rural houses are better furnished with technical and sanitary installations.

Table 1.4. Equipment of rural households with sanitary and technical installations in 2005 and 2011 (in %)

Specification	2005	2011
Sewage system	22.5	45.0
Running water		
water supply	80.0	87.0
hydrophore	21.6	20.8
Boiler/domestic hot water	74.4	89.4
Bathroom	84.8	93.4
WC	82.3	
Central heating	73.7	85.7
Backyard water treatment plant	1.9	7.4

Source: IAFE-NRI surveys 2005-2011.

Figure 1.3. Equipment of rural farming and non-farming households with technical and sanitary installations (in %)



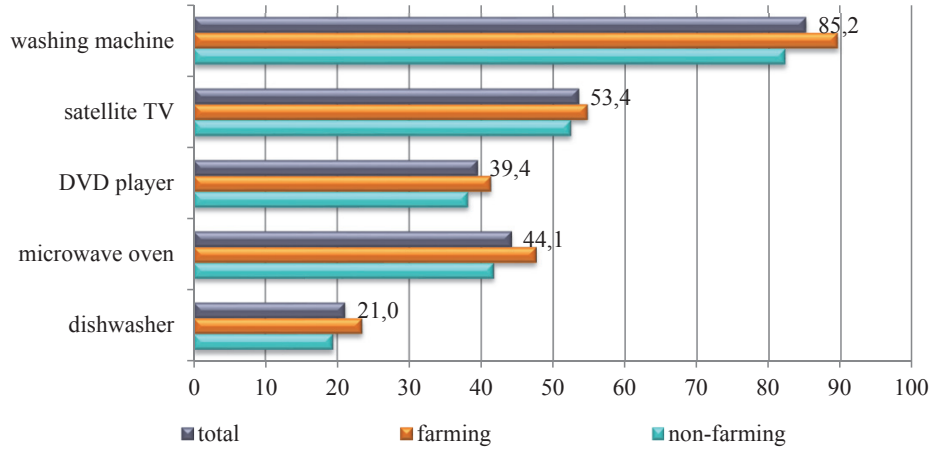
Source: based on the IAFE-NRI survey 2011.

In 2011, 87% of the rural families had running water from the water supply, and 45% of the families were connected to the sewage system. Moreover, 93.4% of the households were equipped with bathrooms and WC and 7.4% of the families possesed even their own backyard water treatment plant (Table 1.4). The farming households (i.e. those having agricultural holdings of more than 1 ha of UAA) were relatively better equiped with sanitary and technical installations than the non-farming households (Figure 1.3).

1.2.2. Equipment of rural households with durable goods

Equipment of rural households with durable goods is, in addition to the level of income they obtain, an important factor that informs about the level and quality of life of the surveyed population. These goods are consumption goods with a long period of use, and the duration of their use depends on the type of needs that they satisfy and the speed of their consumption, and often also on their quality and workmanship. Possesing these goods may also be considered as an indicator of the consumption level in the households. The process of technical and technological innovation is a reason for which furnishing of the households with durable goods is subject to constant changes. As a rule, not only the better quality, but also the extension of the functions of new products in the market and advertising campaigns make consumers replace their equipment with a new one.

Figure 1.4. Equipment of rural households with the selected appliances and devices in 2011 (in %)



Source: IAFE-NRI survey 2011.

Relatively universal access to running water allows the rural families to furnish their dwellings with a number of devices to facilitate their work. First of all, with washing machines and dishwashers. The surveys show that washing machines are held by 85.2% of the rural households, and nearly every fifth family was furnished with a dishwasher. Other modern equipment such as satellite TV was held by more than half of the families (53.4%), a relatively large group of the families also had a microwave oven (44.1%). The farming families were relatively better furnished with those appliances and devices than the landless families (Figure 1.4).

1.2.3. Cars in rural families

From the point of view of the spatial dispersion of villages and specific transport difficulties, it is also very important to have vehicles. In rural areas, having a car was relatively common. Moreover, with regard to equipment with vehicles, the situation has improved when compared to 2005. In general, in 2011, almost one-third of the families had vehicles, and almost every tenth had even two cars. The farming families were slightly better equiped with cars than the non-farming families (Table 1.5). However, those vehicles were generally more than ten years old. The average age of a car in 2011 was 11.6 years, regardless of the type of the rural family.

Table 1.5. Cars in rural families in 2005 and 2011

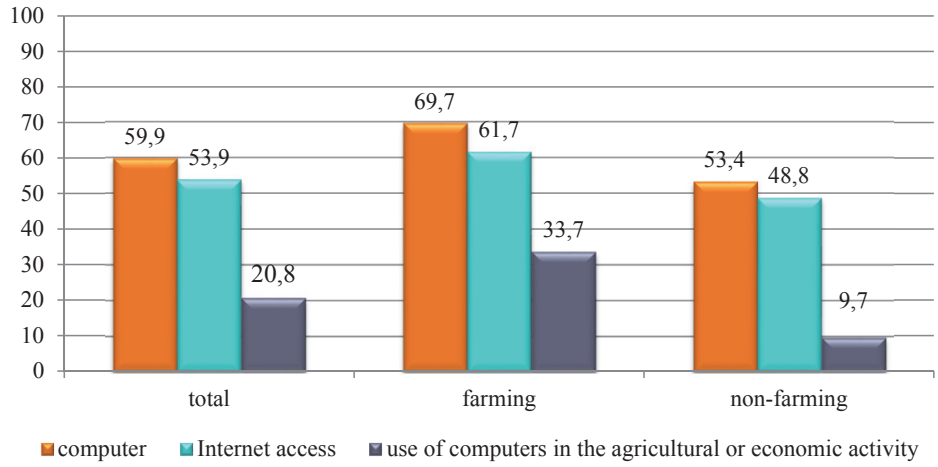
Rural families	Percentage of the families having	
	car	two cars
2011		
total	63.5	9.7
farming	77.9	12.2
non-farming	54.1	8.1
2005		
total	54.0	6.4
farming	69.5	9.5
non-farming	42.3	5.3

Source: IAFE-NRI surveys 2005, 2011.

1.2.4. Use of computers and Internet access in rural areas

The ability to use information has become a prerequisite for the economic and cultural development. In addition, access to these modern information media eliminates a lot of difficulties and limitations related to the distance and spatial dispersion [Kowalski 1998]. Currently, a factor which to the greatest extent differentiates rural equipment in relation to urban equipment is having a computer and Internet access, although the changing reality and a number of conditions in a specific way enforce the use of a computer and the Internet to an increasing extent. It should be stressed, however, that in rural areas this situation has clearly improved in the recent years.

Figure 1.5. Computers, Internet access and use of computers in the rural areas (in %)



Source: IAFE-NRI surveys 2011.

The equipment with a computer has been recorded in 59.9% of the rural households. Almost all of these families also had access to the Internet. Relatively better access to those media and devices was held by the farming families rather than by the non-farming families. In 2011, more than two-thirds of the farming families had a computer while in the non-farming families – more than half. The surveys also show that the farming population, more often than the non-farming population, uses computers and the Internet for the purposes of professional activities. In every third farming family, a computer and access to the Internet were used to pursue the economic of agricultural activity and among the non-farming families that value was lower (Figure 1.5). In this case, just every eleventh family used a computer and the Internet for the economic activity, mainly to contact customers. The farming families relatively often logged onto the websites of the Ministry of Agriculture and Rural Development and the Agency for Restructuring and Modernisation of Agriculture, in addition, half of the families logged onto the websites of the Agricultural Market Agency, slightly less often onto the websites of the the Agricultural Property Agency, the Agricultural Social Insurance Fund and agricultural portals, and only almost every tenth landless family visited those websites. Farmers treat this devices in a more professional way. The use of the Internet in the professional activities of farmers translates into the benefits and effects of their production activities.

1.2.5. Analysis and assessment of the equipment of rural households with durable goods

In order to complement the above examples of equipment of the rural families with durable goods and make a wider analysis of furnishing of households with durable goods, the selected durable goods have been divided into the following categories:

- ⇨ common goods which are, in principle, available to each household as the need arises (and are held by more than 90% of the surveyed holdings);
- ⇨ standard goods held by more than half of the surveyed from the group;
- ⇨ higher standard goods, held by 10-50% of the holdings;
- ⇨ luxury goods, held by less than 10% of the holdings.

In 2011 in surveyed rural households, the group of common goods included: refrigerator, TV set, gas or electric oven and vacuum cleaner. Washing machines also were relatively popular in households and basically may be included into the group of common groups, as held by nearly 90% of rural households (Table 1.6).Standard goods included PC, satellite (or cable) TV set, landline telephone, passenger car, freezer and cell phone. Higher standard goods included dishwasher, microwave oven, DVD player. Just as in case of washing machines,

this group may also include video cameras and the second car, as they were held by nearly every tenth rural household. The group of luxury goods held by less than every tenth family, in 2011 included motorcycles. However, it should be noted that the fact that some of those durable goods belonged to the particular category does not result only from their standard, i.e. the financial situation of households, but also from a set of the analysed group of goods. For example, a video camera may be redundant to a holder of a digital camera, a PC may perform many multimedia features.

Table 1.6. Classification of durable goods in the surveyed rural households in 2005 and 2011

Category of goods	2005	2011
Common more than 90% of households	refrigerator TV set gas or electric cooker	refrigerator TV set gas or electric cooker vacuum cleaner washing machine (85.7%)
Standard more than 50% of households	vacuum cleaner radio cassette player landline telephone washing machine passenger car freezer	PC satellite (cable) TV set landline telephone passenger car freezer cell phone
Higher standard 10-50% of households	cell phone video (DVD) player satellite (cable) TV set PC food processor microwave oven	dishwasher microwave oven DVD player video camera (9.1%) second car (9.7%)
Luxury less than 10% of households	second car video camera dishwasher motorcycle	motorcycle

Source: IAFE-NRI surveys 2005-2011.

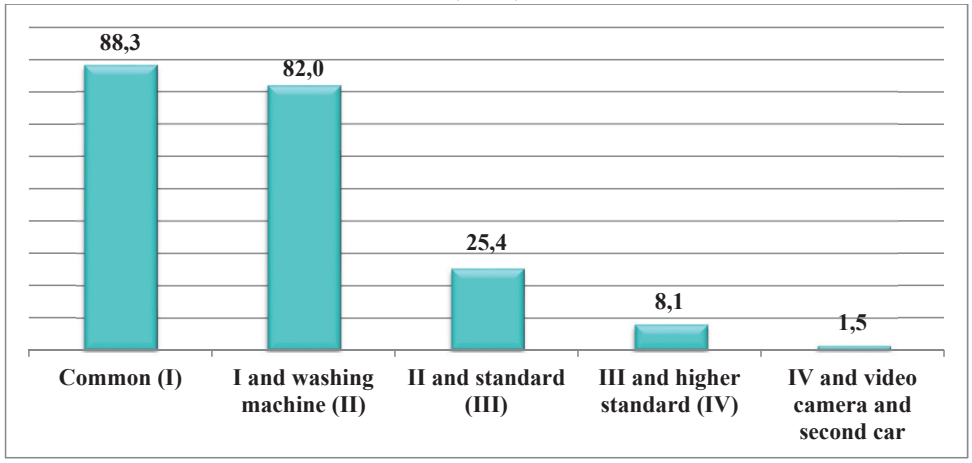
Today, in households, many goods stopped being necessary e.g. sewing machine or electric clothes presses and the fact that they are held by a small percentage of the families does not make them luxury goods. Nevertheless, according to the survey, the specific improvement in equipment of rural households with durable goods, as measured by the above categorisation of goods, was recorded.

The data on the equipment with durable goods specified in the survey also allowed to attempt to determine the types of rural households. The number of

goods evidences the degree of modernity of the household. It is a kind of ladder, where the lowest level is the situation when the household does not have any of the goods listed in the survey. In the survey, the level of equipment with durable goods proved to be high, which allowed to determine the relative dimension of wealth of the surveyed families.

The surveys showed that all the above-mentioned devices, as common goods in 2011, were held by 88.3% of the farming families. When we extend this group of items by washing machines, the percentage is 82.0%. In total, common and standard goods were held by nearly one fourth of the farming families (25.4%). On the other hand, when we extend the group of families by furnishing with higher standard goods, the number of the families decreased to 8.1%. By adding successively furnishing with video cameras and the second car in the family – the number of the families decreased to 1.5% (Figure 1.6).

Figure 1.6. Equipment of the farming households with groups of durable goods (in %)



Source: IAFE-NRI survey 2011.

According to the CSO data, equipment of the farming families with durable goods, when compared to other socio-economic groups of households, in case of the majority of the highlighted goods is worse (Table 1.7 and Table 1.8).

The clear differences are shown when compared to the group of employees and self-employed persons. Only equipment with refrigerators, TV sets is at the similar level. On the other hand, better is furnishing with vehicles (cars, especially motorcycles and bicycles), which in case of farmers are popular, and often also the only means of transport.

Table 1.7. Equipment parity of farming households against other socio--economic groups in 2013 (in %)

Specification	Households:				
	farmers	total	employees	self-employed	pensioners and retirees
		farmers=100.00			
Refrigerator	99.1	99.0	99.1	99.4	99.0
Washing machine	92.5	100.8	104.2	105.9	96.3
Washing machine and electric tumbler	22.4	44.2	30.8	21.0	59.8
Dishwasher	23.9	93.3	118.8	207.1	42.7
Microwave oven	63.1	89.1	105.1	114.4	62.9
Passenger car	92.2	66.4	81.3	99.3	40.5
Motorcycle, scooter	18.9	33.3	40.2	47.1	14.3
Bicycle (exclusive of children's bicycles)	89.3	69.7	78.3	81.2	53.6
Audio system	33.2	98.8	127.1	143.1	53.6
TV set	99.4	97.7	97.7	96.7	99.2
including set to receive digital terrestrial television MPEG-4	42.6	104.5	119.7	137.6	83.3
DVD player	53.7	84.2	101.1	109.7	57.4
Cell phone	97.7	95.7	101.8	101.8	85.1
Home theatre	10.0	142.0	196.0	292.0	51.0
Satellite or cable TV set	56.2	118.0	128.6	133.1	106.4
Video camera	6.0	153.3	203.3	380.0	60.0
Digital camera	55.7	91.2	119.0	144.0	44.2
PC	81.2	88.1	111.2	116.5	48.6
including with access to the Internet	75.7	90.9	115.9	122.9	49.4
including with broadband access	58.9	94.1	120.4	129.9	49.9
Printer	46.6	76.8	100.2	138.8	31.5
including multi-function	28.9	75.8	99.3	149.5	27.3

Source: based on the CSO data [GUS 2014].

Households of farmers were better in relation to the group of pensioners and retirees. However, it should be stressed that in 2013, when compared to 2005, the differences in equipment of households of farmers with selected devices, as regards the group of employees and self-employed persons have relatively decreased. More than half of the total population of the surveyed villages (54.4%) rated positively furnishing of their houses, a little over a third considered it average and only less than every fifteenth considered it bad. This rating was relatively better in case of the farming families (Figure 1.7).

Table 1.8. Equipment parity of farming households against other socio-economic groups in 2005

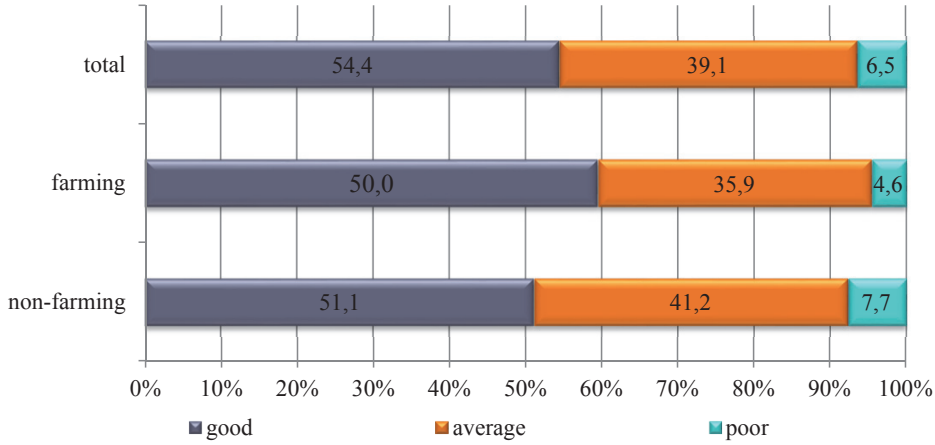
Specification	Households:				
	farmers	total	employees	self-employed	pensioners and retirees
		Farmers=100.00			
Refrigerator	98.4	98.9	99.7	99.3	98.7
Washing machine	67.8	117.7	129.8	137.3	107.1
Washing machine and electric tumbler	58.4	48.1	36.6	24.7	58.2
Dishwasher	3.8	128.9	165.8	521.1	50.0
Microwave oven	29.5	112.9	148.1	202.4	67.8
Passenger car	79.7	59.5	75.4	103.6	35.1
Motorcycle, scooter	11.0	30.0	32.7	50.9	17.3
Bicycle (exclusive of children's bicycles)	93.0	67.1	77.0	78.7	52.6
Audio system	43.4	100.9	142.9	162.0	48.8
TV set	99.4	98.8	99.3	99.0	98.9
DVD player	16.3	140.5	212.9	278.5	54.0
Cell phone	69.8	93.4	123.4	130.4	53.9
Home theatre	7.9	141.8	213.9	325.3	46.8
Satellite or cable TV set	23.2	207.8	245.7	284.5	176.7
Video camera	2.6	238.5	334.6	819.2	88.5
Digital camera	10.9	168.8	245.9	403.7	56.0
PC	35.6	108.4	160.1	198.3	42.4
including with access to the Internet	11.4	197.4	295.6	447.4	73.7
Printer	23.2	111.2	165.5	236.6	40.9

Source: based on the CSO data [GUS 2012].

In total, when compared to 2005, there was an increase in the percentage of the families which rated positively their furnishing with durable goods (Figure 1.4). The farming families rated their furnishings better than the non-farming families. In the past, it the latter category adopted the urban patterns in the countryside, now the situation changes.

The major deficiencies in households and a specific difficulty in the work related to the household were indicated in nearly half (48.5%) of the surveyed families. Those deficiencies related mainly to technical infrastructure – no sewage system in case of 11.6% of the families, the lack of central heating and bathrooms was recorded less often (less than every twentieth family reported such a difficulty).

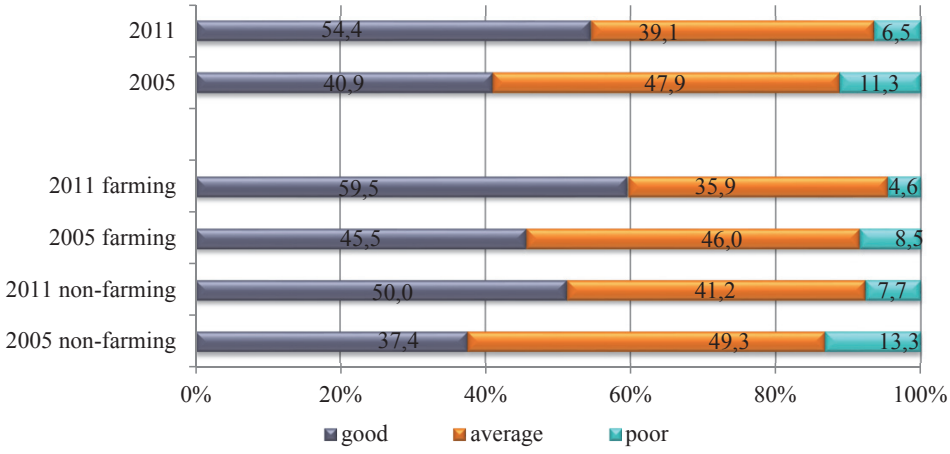
Figure 1.7. Equipment of households according to the residents of the surveyed villages (in %)



Source: IAFE-NRI survey 2011.

In the surveyed households, the work was made most difficult by the lack of a dishwasher (11.6% of the responses). In nearly every twentieth family, the lack of a washing machine made its functioning difficult.

Figure 1.8. Equipment of households according to the residents of the surveyed villages (in %)



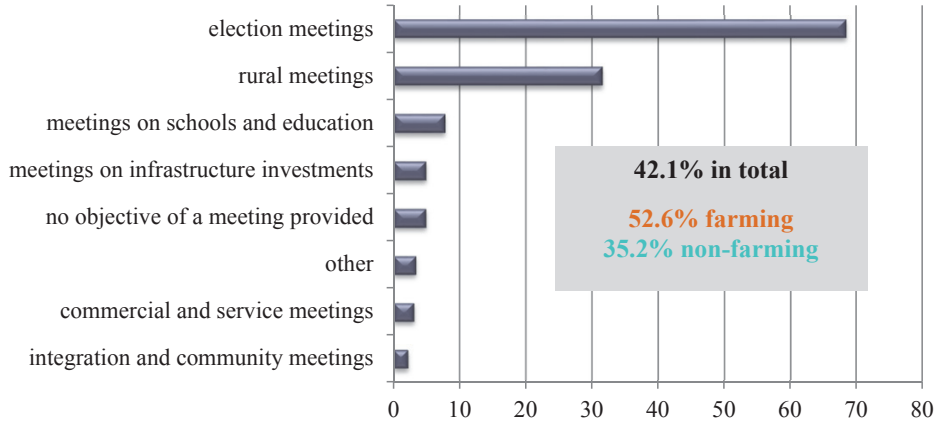
Source: IAFE-NRI surveys 2005-2011.

1.3. Social organisations in the rural environment

1.3.1. Involvement of the population in the social life of countryside

It follows from research results that in the recent years the social activity of the rural residents has increased, understood as participation and involvement of the population in the social life of the countryside [Wrzochalska 2015]. Relatively low participation among socially active persons was observed in the case of young people, and women with higher education, which is a consequence of demographic changes (ageing of the society, migration of young people).

Figure 1.9. Participation of the rural population in public meetings (% of rural families)

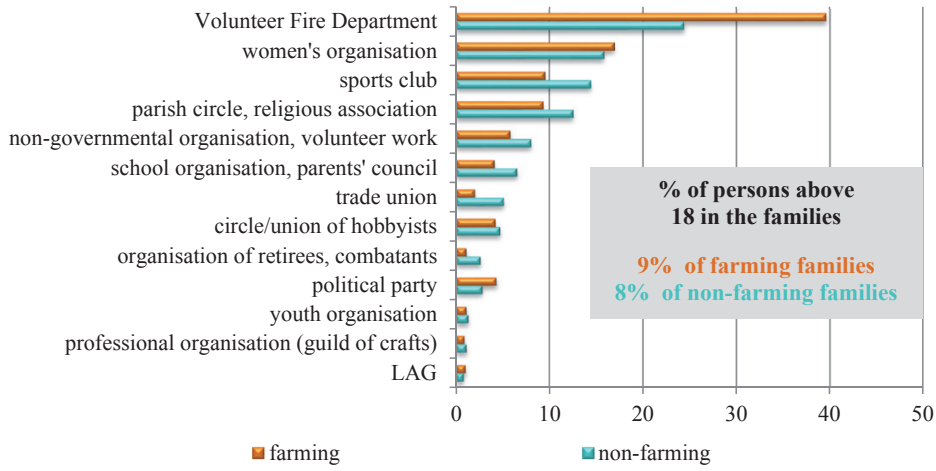


Source: IAFE-NRI survey 2011.

Social activists are more willing to act in larger groups than they did in the past. The percentage of the villages where men and women were socially active together increased. Also, the more numerous groups of such persons started forming which points to building of local social capital. Attention should also be paid to relatively high participation of the rural population in various types of meetings (Figure 1.9), working in organisations (Figure 1.10), performing functions in these organisations (Figure 1.11).

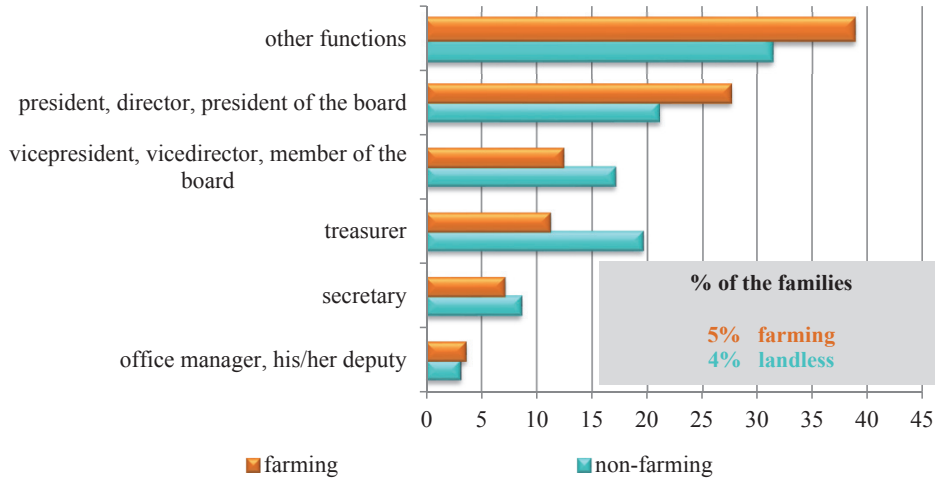
All this translates into the level of trust in the rural society: what is close to us, enjoys the higher level of trust, and what is far from us: central authority – lower (Figure 1.12). What can be observed is that a traditional value system, and somehow a Positivist approach: a good farmer is the one whose authority increased the most (Figure 1.13), this stresses the very important role played by such persons in the rural community.

Figure 1.10. Members of organisations, associations, parties, committees, religious groups, unions, circles in rural areas (in %)



Source: IAFE-NRI survey 2011.

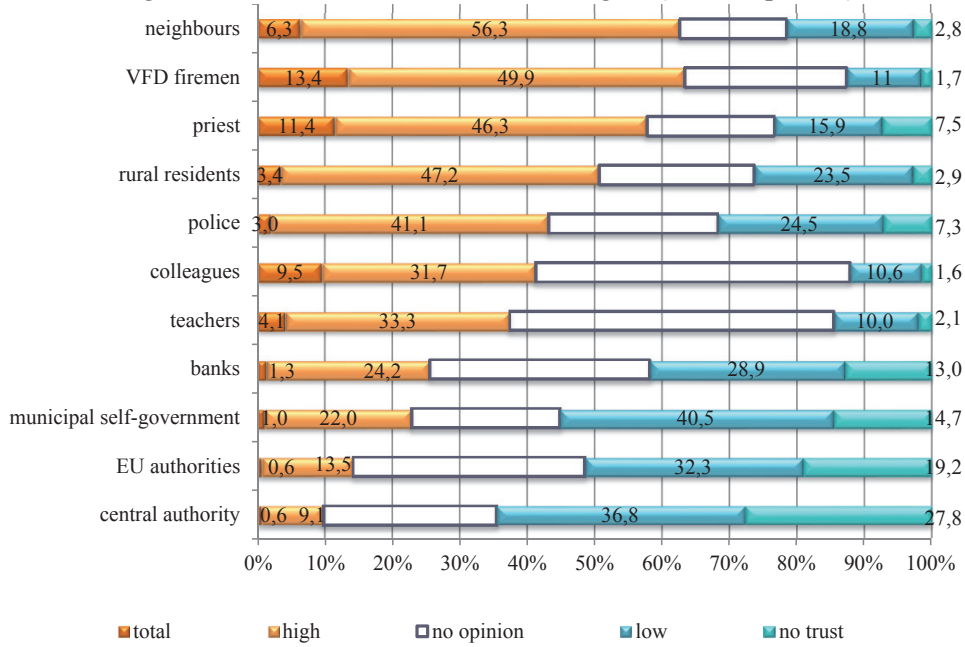
Figure 1.11. Functions performed in organisations (in %)



Source: IAFE-NRI survey 2011.

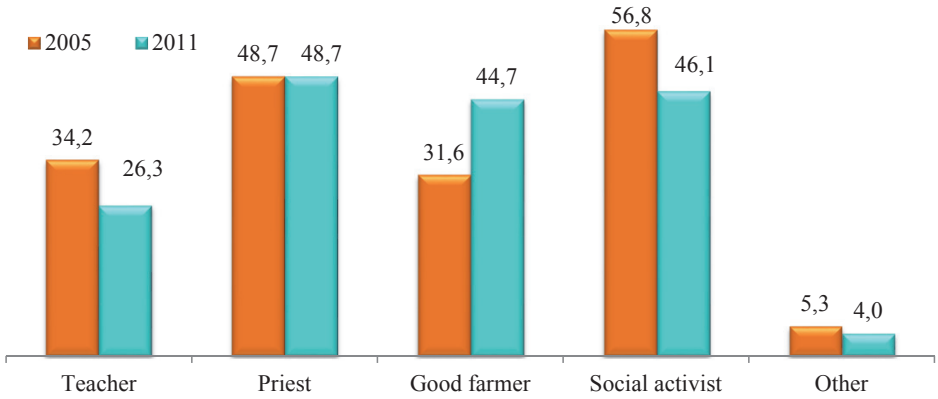
The rural population also acts in various types of formal organisations. But this applies to less than every tenth adult. These are primarily traditional organisations active in rural areas.

Figure 1.12. Level of trust of farm managers (% of responses)



Source: IAFE-NRI survey 2011.

Figure 1.13. Authorities of the community in rural areas in 2005-2011



Source: IAFE-NRI surveys 2005-2011.

1.3.2. Volunteer Fire Department

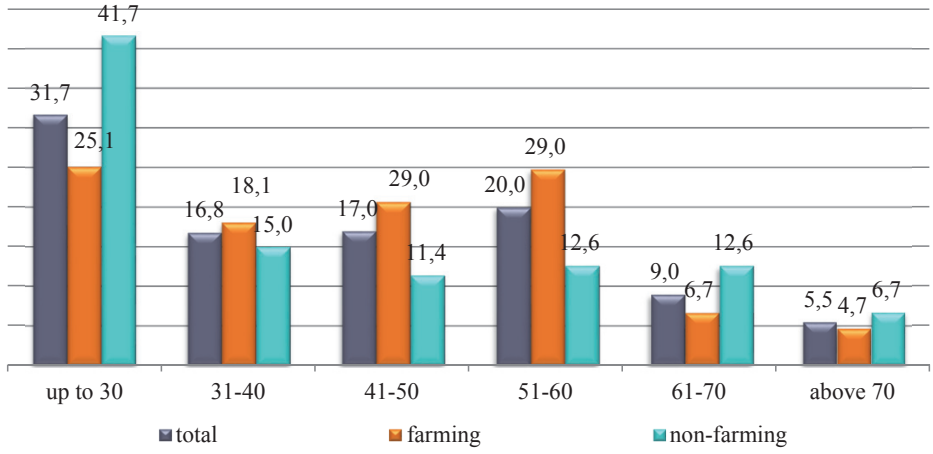
For many years, the most popular organisation in rural areas has been the Volunteer Fire Department (VFD). The VFD members were present in 67.1% of the surveyed villages. In more than half of the surveyed villages (54.0%), the groups of firemen had more than 5 persons. On average, such a group of firemen

consisted of 15-16 persons, while the most numerous had 47 firemen. Most firemen came from the farming families – 60.4%. Also women were members of the fire department. In general, their percentage was 12.8%. In the group of firemen from the farming families, every tenth person was a woman and in the group of persons from the landless families – it was every sixth person.

The VFD members came from various age groups. The average age of a fireman in the surveyed villages was 42 years. This average was slightly lower in the non-farming families (39 years when compared to 43 years in the farming families). In general, nearly one-third of firemen were not older than 30, and every seventh fireman was older than 60 (Figure 1.14).

In the surveyed villages, firemen represented diversified levels of education (Table 1.9). The highest percentage of them had vocational education (more than every second person), while every third fireman had secondary or post-secondary education. Every thirteenth person had higher education. In turn, agricultural education (at school or training) was held by every fourth fireman.

Figure 1.14. Age structure of firemen in the surveyed villages (in %)



Source: IAFE-NRI survey 2011.

There was a regional diversification of the villages with regard to the presence of the VFD members in their areas (Annex, Map A.2). The highest percentage of such villages has been recorded in the Central-Western macroregion (90.0% of the villages), and in the South-Western macroregion (80.0% of the villages). The lowest percentage of the villages with the VFD members was in the South-Eastern macroregion (56.3% of villages).

Table 1.9. Level of education of firemen in the surveyed villages

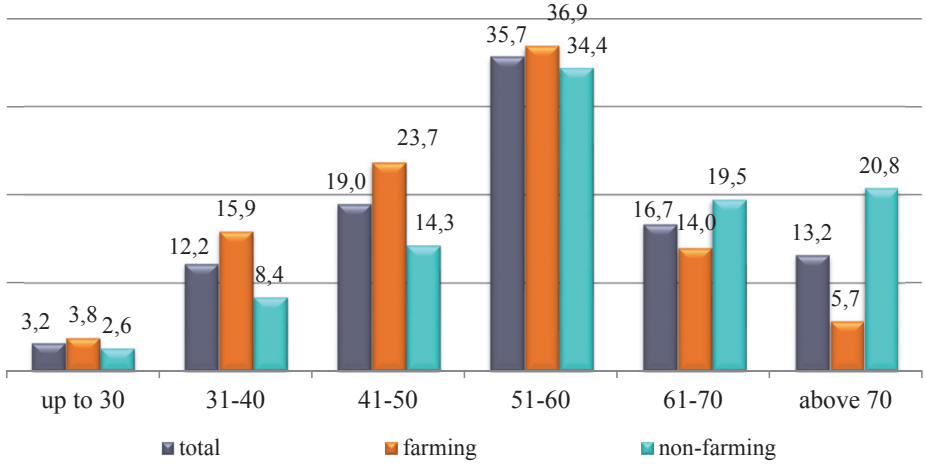
families	higher master's degree	higher bachelor's degree	secondary and post--secondary	vocational	lower secondary and prima-ry
total	5.5	2.0	29.7	42.6	20.2
farming	6.5	1.0	30.0	45.2	17.3
non-farming	4.0	3.5	29.1	38.6	24.8

Source: IAFE-NRI survey 2011.

1.3.3. Women's organisations

Members of typical women's organisations, including the Farmers' Wives' Associations (FWA) have been recorded in 43.4% of the villages. In every fourth surveyed village, there were the groups of more than 5 persons being members of such organisations. The largest of those groups consisted of 28 members. The average size of such a group was about 16 persons. The women from both farming and non-farming families acted in the women's organisations equally often. The age of the members of the women's organisations operating in the surveyed villages was diversified. In total, every third of them belonged to the age group 51-60 years, one in five to the age group 41-50 years. The smallest group among the organisation members were the youngest women (below 30 years) (Figure 1.15).

Figure 1.15. Age structure of the women belonging to the women's organisations (including FWA) in the surveyed villages (in %)



Source: IAFE-NRI survey 2011.

Nearly every third woman belonging to this type of organisation had secondary or post-secondary education, the similar group had vocational education, every fourth woman had lower secondary or primary education. The smallest groups among the women members were the women with higher education. The structure of the level of education of the women activists in the farming families was slightly more favourable than in case of the non-farming families (Table 1.10).

The analyses carried out showed that in the women's organisations 5.5% of the members were the men. Most often, they were the spouses of the members (66.7% of the cases), sons (16.7%) or sons-in-law (5.6%), less often other members of the family. The oldest man belonging to the women's organisation was 83, the youngest – 19. The slightly younger men came from the farming families – in this group of persons – they were from 54 to 28 years. Most often, these persons had secondary education, and also vocational education, there were no men with higher or post-secondary education.

Table 1.10. Level of education of the women members of the women's organisations (including FWA) in the surveyed villages

families	higher master's degree	higher bachelor's degree	secondary and post--secondary	vocational	lower secondary and primary
total	3.5	1.0	34.4	38.6	22.5
farming	3.8	0.6	36.9	39.5	19.1
non-farming	3.2	1.3	31.8	37.7	26.0

Source: IAFE-NRI survey 2011.

It follows from the research results that in 2011 the traditional FWA were recorded in 18.4% of the villages, which, on a national scale, accounted for about 10 thousand localities. This organisation becomes less popular in rural areas, than it was in the past[1], although in total the activity of rural women has significantly increased in relation to the previous years. Active women in 2011 were reported in almost every third village (63.2%), and in 2005 there were 40.8% of such villages. Modern rural women have become more independent, more women are in senior positions and they take initiative in respect of activities aimed at improving their situation.

There was a regional diversification in the villages with regard to the presence of the members of typical women's organisations in their area

[1] Still at the beginning of the 1990s, FWA were reported in 58% of the surveyed villages [Sikorska 1993].

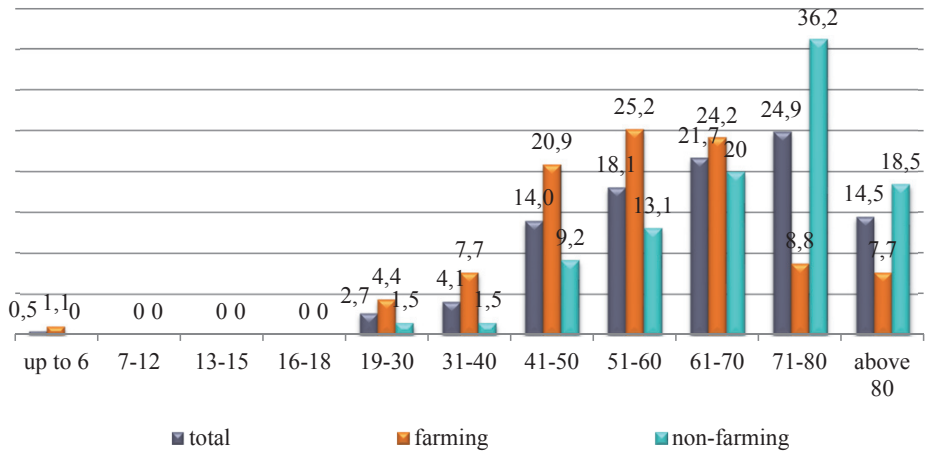
(Annex, Map A.3). The highest percentage of such villages has been recorded in the Central-Western macroregion (80.0% of the villages), and in the South--Western macroregion (70.0% of the villages). The lowest percentage of the villages with the members of the women's organisations was in the Central-Eastern macroregion (22.6% of the surveyed villages).

1.3.4. Religious associations and groups

The rural population also belonged to organisations linked with the churches or parish circles. The members of such assemblies were reported in nearly half of the surveyed villages (48.7% of the villages). The farming population accounted for more than half of those persons (58.8%). The size of those groups was varied. Religious groups consisting of more than 2 persons were recorded in 30.3% of the villages, and those of more than 5 persons – in 13.2% of the villages. The most numerous of them consisted of 55 persons. The average size of such a group was nearly 6 persons. Most of the members were women (86.4%), regardless of the status of the family.

More than one-third of the members of associations and other religious groups were persons aged 71-80 and nearly every fifth person was more than 80 (Figure 1.16).

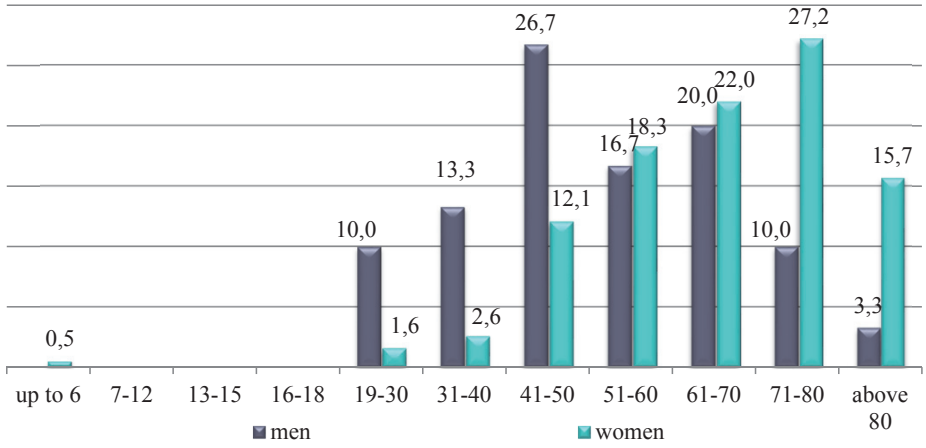
Figure 1.16. Age structure of persons belonging to the organisations linked with churches (parish circles) in the surveyed villages (in %)



Source: IAFE-NRI survey 2011.

According to the IAFE-NRI surveys, among the members of those groups, a relatively large share of young men was reported: every tenth belonged to the age group 19-30 years, every eighth was below 40 and every fourth was aged 41-50 (Figure 1.17). Among the rural women, persons from the oldest age groups prevailed. Attention should be paid to the fact that there are no religious groups for children and schoolchildren. Apart from participation of rural children in the religion teaching process at school, no members in any of the specified age groups representing the levels of education were recorded. Also, the low share of pre-school children was recorded. These were mostly girls from the farming families who participated in the church ceremonies and feasts.

Figure 1.17. Age structure of persons belonging to the organisations functioning at churches (parish circles), by sex (in %)

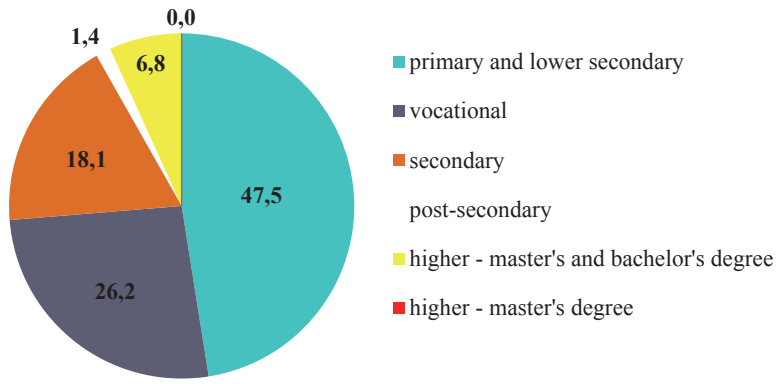


Source: IAFE-NRI survey 2011.

Among the members of associations and various religious groups, the most numerous group were the persons with the lowest level of education (nearly half), every fourth person had vocational education and less than every tenth person had higher or post-secondary education (Figure 1.18).

Involvement and membership in the religious groups did not depend on the spatial distance from the parish. The members of these groups comparatively often were present in the villages with the church and in those distant from the parish (Table 1.11). However, in the villages, where the distance from the church (parish) was relatively small, the groups of those associations were more numerous. Those groups were present both in the parishes, which were rated by the residents as working well and in those rated worse (Table 1.12).

Figure 1.18. Level of education of persons belonging to the organisations within churches (parish circles, associations) (in %)



Source: IAFE-NRI survey 2011.

Table 1.11. Members of parish circles/religious associations by spatial distance from the parish

total	in the village	1-2 km	3-4 km	5-6 km	7-9 km
Percentage of the surveyed villages by distance from the parish					
100.0	34.2	11.8	31.6	14.5	7.9
Percentage of the villages with the members of religious circles/associations					
48.7	42.3	55.5	50.0	45.5	66.7
Percentage of the members by distance from the parish					
100.0	45.2	12.2	33.9	3.7	5.0
Average size of the religious group/association					
6	9	5	6	2	3

Source: IAFE-NRI survey 2011.

However, those parishes rated as working well, brought together the vast majority of the members and more numerous religious groups. It can be concluded that involvement in the parish affairs by participating of a significant number of the rural residents in the religious associations, parish groups may translate into the good rating of the functioning of the entire parish.

There was a regional diversification in the villages with regard to the presence of the members of the parish associations, groups or religious circles in their area (Annex, Map A.4). The highest percentage of such villages has been recorded in the South-Western macro-region (80.0% of the villages). The lowest percentage of the villages with the members of the religious groups and associations was in the Central-Eastern macro-region (37.5% of the surveyed villages).

Table 1.12. Members of parish circles/religious associations by rating of the parish (in %)

total	good	medium	poor
Percentage of the surveyed villages by rating of the parish			
100,0	63,2	26,3	10,5
Percentage of the villages with the members of religious circles/associations			
48,7	54,2	40,0	37,5
Percentage of the members of religious circles/associations			
100,0	87,3	10,0	2,7
Average size of the religious group/association			
6	8	3	2

Source: IAFE-NRI survey 2011.

1.3.5. Political parties

The members of the political parties were present in 44.7% of the surveyed villages. The groups consisting of two and more persons have been recorded in every fifth village. On average, such a group consisted of 3-4 persons (the most numerous group had 6 persons). Nearly 60% of the members were the persons from the farming families, and more than one-third (36.6%) were women. Particularly politically active were the women from the non-farming families, their share among the party members, from this group of families was 48.3%, when compared to 28.6% in the farming families. Half of the women members of the party had secondary or post-secondary education (Table 1.13), in the group of the men the largest group were the persons with vocational education (42.2% of the members). Nearly every fifth person, regardless of sex, had higher education.

Table 1.13. Level of education of the members of the party in the villages

families	higher master's degree	higher bachelor's degree	secondary and post--secondary	vocational	lower secondary and primary
total	19.7	1.4	33.8	36.6	8.5
women	19.2	-	50.0	26.9	3.9
men	20.0	2.2	24.5	42.2	11.1

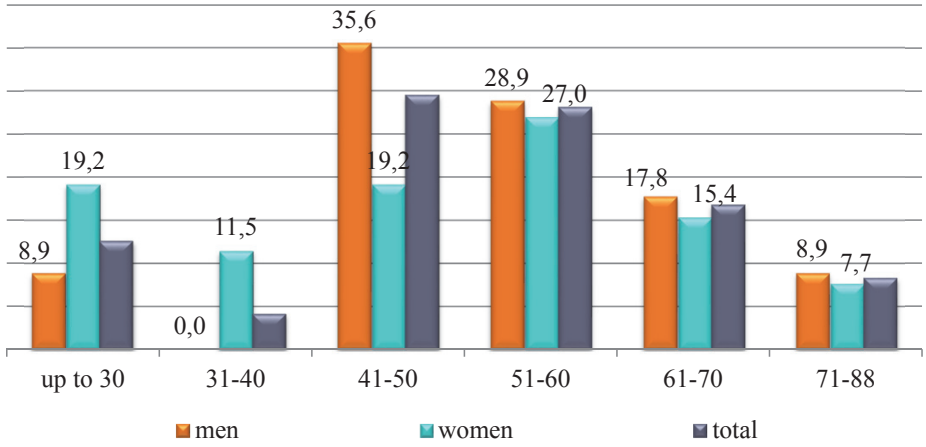
Source: IAFE-NRI survey 2011.

In the structure of education of those persons, the largest group were the persons aged 41-50 and 51-60 (Figure 1.19). Attention should be paid to the relatively numerous group of young women (below 30) – nearly every fifth woman member of the party, as well as involvement of the persons from the oldest age

group in the political matters – almost every eleventh member of the party, regardless of sex, was older than 70. The average age of the member of the party in both communities (farming and non-farming) was 51.

The relatively significant numer of party members in rural areas translates into participation in election: self-government, presidential or parliamentary (Table 1.14).

Figure 1.19. Age structure of the rural members of political parties, by sex (in %)



Source: IAFE-NRI survey 2011.

Table 1.14. Participation in election (percentage of heads of the families)

families	parliamentary	presidential	self-government	all	none
total	70.3	74.7	72.5	62.5	19.8
non-farming	65.1	70.0	67.4	60.1	25.0
farming	78.3	81.8	80.1	73.7	13.8
women	74.8	79.0	75.8	70.0	16.7
men	79.3	82.7	81.4	74.8	12.9

Source: IAFE-NRI survey 2011.

In all types of election, the members of 62.5% of the farming families participated in total, no less than every fifth family participated in any of the above-mentioned election. Particularly active in this regard, were the members of the farming families.

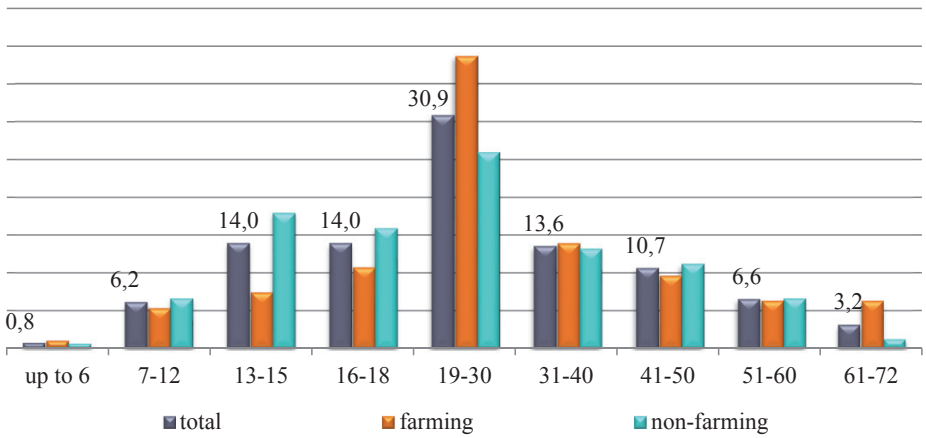
Also with respect to the members of the political parties, a regional diversification in the villages with regard to the presence of such persons was noted (Annex, Map A.5). The highest percentage of such villages has been recorded in

the Central-Western macroregion (60.0% of the villages) and in the South-Eastern macroregion (50.0% of the villages). The lowest percentage of the villages with the members of the political parties was in the Central-Eastern macroregion (35.5% of the surveyed villages).

1.3.6. Sports clubs

In the surveyed villages there were also sports clubs (SC). The presence of their members has been recorded in 46.1% of the villages. In every fourth village, the sports groups consisted of more than 5 persons. Among the athletes, the share of the persons from the farming families was higher. They represented 61.7% of the athletes. The sports clubs had also women members (nearly every fourth club member). Their percentage was similar in both communities of the families: 23.7% in the farming families and 22.6% in the non-faming families.

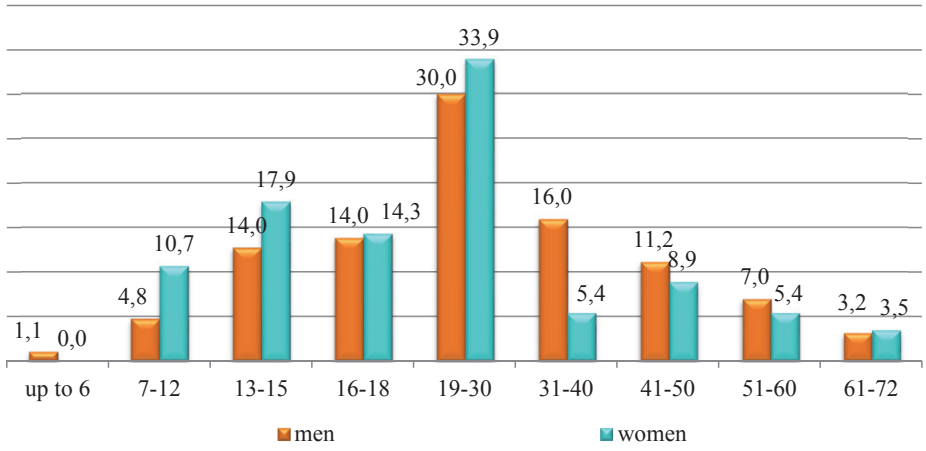
Figure 1.20. Age structure of the sports club members in the surveyed villages (in %)



Source: IAFE-NRI survey 2011.

The age structure of the sports club members was diversified (Figure 1.20). The largest share among the persons active in sports was that of the persons aged 19-30. Every third sports club member was of that age. In this case, particularly in the farming families, the percentage of the persons of that age was significant. It could be concluded that rural areas acquire the urban model of spending time by young persons on sport activities, which translates into a healthy lifestyle. Attention should be paid to relatively low participation of schoolchildren in sports activities, especially at the lowest levels of education and in the case of pre-school children.

Figure 1.21. Age structure of the sports club members, by sex (in %)

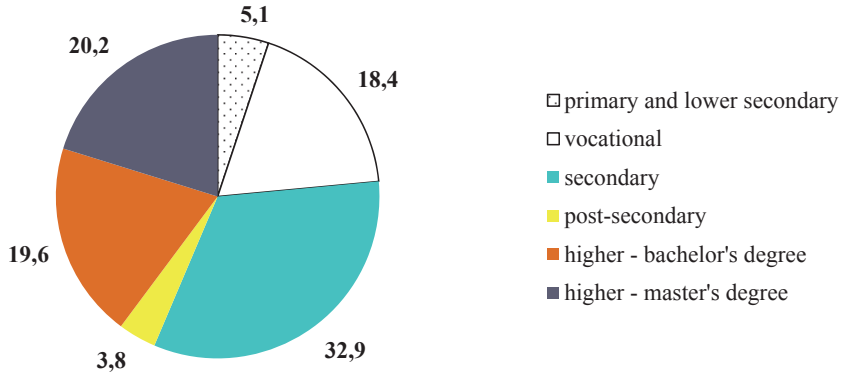


Source: IAFE-NRI survey 2011.

Research results show that the children and schoolchildren in the farming families were more often provided with a possibility of participating in sports activities than in the non-farming families. As part of those activities, in the youngest age groups of up to 15, i.e. at the primary school and lower secondary school level, girls practised sport more often (Figure 1.21). In the case of secondary school students and persons below 30, the share of girls (young women) and boys (young men) was at a similar level. The analysis of the age structure of the sports club members shows that the sports activity of women decreased in the group of women of procreation and older age. We should stress the fact that every tenth sports club member was in the age group 41-50 years, which also may be perceived as a health-promoting attitude of the rural population and the acquisition of the urban model, also among adults.

By analysing the structure of education of adults (above 18 years) involved in sports activities, attention should be paid to the fact that nearly every second person had the higher level of education (master's or bachelor's degree or post-secondary school), and every third member had secondary education (Figure 1.22). We may conclude that the sport-oriented attitude and the active way of spending free time in the rural environment is promoted by well-educated persons who often could be active in sports during the process of learning and now they are continuing their interest.

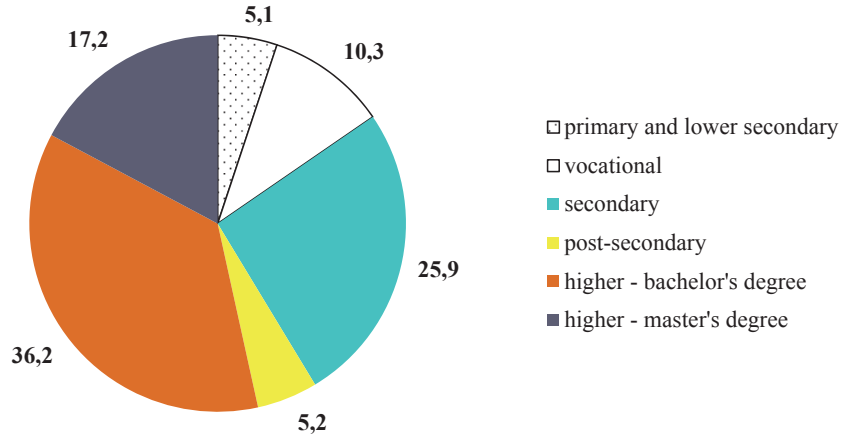
Figure 1.22. The level of education of the sports club members (aged 18 and more) in the surveyed villages (in %)



Source: IAFE-NRI survey 2011.

These observations are also confirmed by the analysis of the structure of education as regards the biggest group of the sports club members (aged 19-30 years). First of all, this group is dominated by the graduates from universities and post-secondary schools (Figure 1.23).

Figure 1.23. The level of education of the sports club members in the age group 19-30 (without persons continuing their education) (in %)



Source: IAFE-NRI survey 2011.

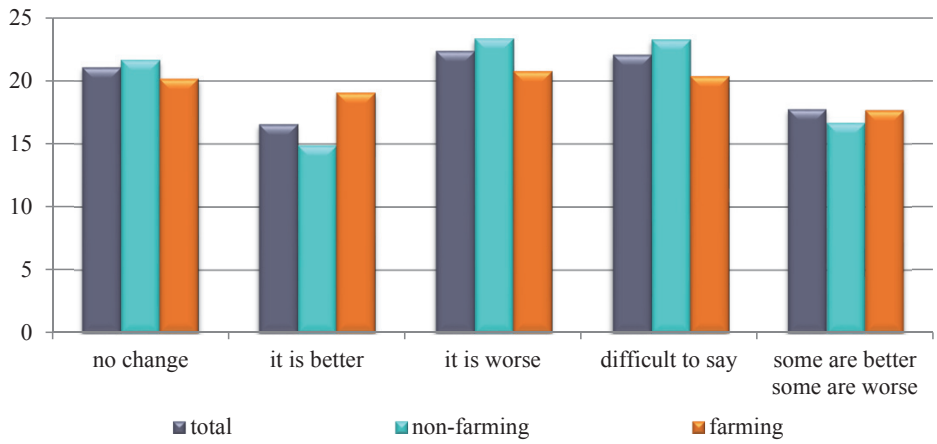
There was a regional diversification of the villages with regard to the presence of the sports club members in their areas (Annex, Map A.6). The highest percentage of such villages has been recorded in the Central-Western macroregion (57.3% of the villages), and in the Northern macro-region (55.0% of the villages). The lowest percentage of the villages with the sports club members was in the South-Eastern macroregion (41.3% of villages).

1.4. Living standards and needs of the rural population

1.4.1. Assessment of the living standards

Changes in the professional attitudes, especially between the farming and non-farming population, are also reflected in their opinions on the living standards in rural areas. The percentage of people from farming families considering their living standard as better than in 2005 was higher (Figure 1.24). Among all people living in rural areas, the positive changes were noticed by 13.5% of them. The members of farming families were more optimistic than in the case of the non-farming families. Almost one-fourth of those persons (who noticed that it was better) thought that their financial situation improved, they have a job, they modernised or increased the scale of agricultural production. Nearly every fifth person from the group of the satisfied also noticed the improvement in the level of technical infrastructure in rural areas (e.g. building of a water supply, gas pipeline, bus stop). Also the less numerous group noticed the positive changes regarding the supply or pointed to the possibilities of modernising or upgrading the farm, which significantly improved the conditions of work in agriculture.

Figure 1.24. Changes in the living standards in rural areas in 2005-2011
(% of opinions of the rural residents)



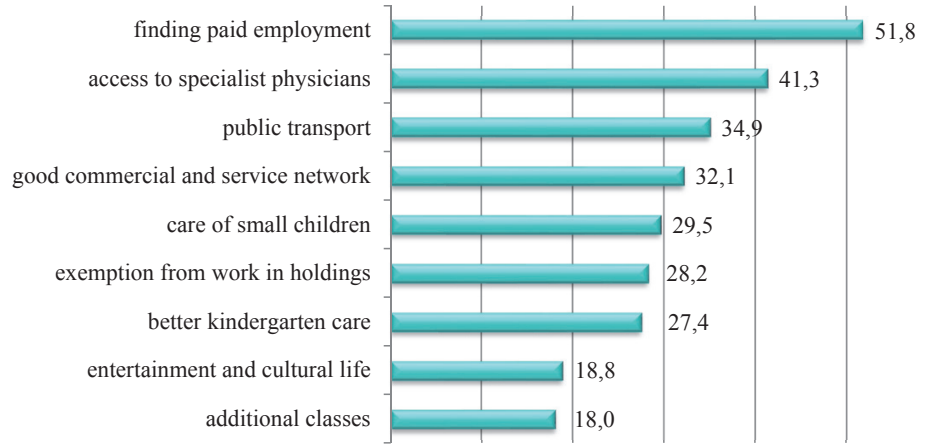
Source: IAFE-NRI survey 2011.

The relatively large percentage of the persons did not notice any changes or was unable to clearly identify their situation in relation to the issues related to their living standards in rural areas. Almost every fifth rural resident decided that their living standard had become worse. Most of those persons (nearly two thirds) stressed that their financial situation had deteriorated (their income decreased, the profitability of agricultural production deteriorated, there were problems with the sale or contracting). There were also signals regarding an impossibility of finding a job and the unemployment in the countryside. The deterioration of the situation in rural areas in the recent years was indicated more often by the persons not associated with agriculture. Therefore, the situation where it was the non-farming population who had the better living conditions in the countryside has been reversed.

1.4.2. Chances of staying people in rural areas

In rural areas the underdevelopment of social and technical infrastructure is still a challenge, but the biggest problem is a need to improve the economic situation, including providing jobs, especially for the persons from the non-farming families (Figure 1.25). In the opinion of rural residents, currently the situation is better, because they can clearly see the improved financial situation mainly thanks to modernising or enlarging the farms, increasing the scale of production, which results not only in higher income, but also agricultural work becoming lighter and easier. Moreover, technical infrastructure in the villages improved.

Figure 1.25. Chances of staying people in rural areas



Source: IAFE-NRI survey 2011.

The rural residents noticed negative changes as well. It is worse because the financial situation deteriorated (income and earnings decreased, decline in the profitability of agricultural production is noticeable). Sometimes, it is not even worth producing as there are no possibilities of selling and contracting. Social changes in rural areas in Poland in the second decade of XXI century are also a kind of fulfilment of social and economic aspirations of the population due to the distant location of the countryside.

Chapter 2
Development of rural regions in Poland and smart specialisation

2.1. Introduction

When considering the issues of the economic downturn, crisis situations or loss of the competitive position of a given country, the modern economic theories stress the low effectiveness of state intervention consisting in stimulating the aggregate demand, but also point to the ineffectiveness of the approach based on limiting the economic policy [Wade 2003, Szymański 2007]. In a situation of uncertainty and instability in the markets, mobility of capital and the global nature of economic transactions, public authorities involve in increasing the economic potential of the state, by supporting domestic economic entities [Szymański 2007]. This support is aimed at increasing the competitiveness of companies by helping them create new organisational structures, products and services with high added value, improve knowledge and qualifications of their employees or shape the conditions conducive to pursuing economic activity[2] [Lazonick 2016]. The adaptation of companies to the dynamic changes in the market environment involves public institutions operating at various levels of territorial organisation [Kalmut 2000]. Particularly, the regional authorities are of importance, because they seek to initiate, maintain or accelerate the speed of the economic development processes in the area of responsibility, mostly by increasing the investment attractiveness for enterprises, joining the global circulation of goods and services or building links between various organisations [Gorzelak and Jałowiecki 2000, Woods et al. 2015].

Experience from the implementation of development strategies in many places has highlighted the effectiveness of policy instruments referring to the specific characteristics of the regions while supporting the process of the diversification of economies, which was aimed at limiting the phenomenon of unemployment [Kalmut 2000]. From the point of view of improving the competitiveness of areas facing structural difficulties, what is particularly stressed is the importance of activities aimed at improving infrastructure, human capital and the research sector [Borowiec 2000]. Nevertheless, as an important stimulus for the

[2] The policy of active and effective support for domestic economic entities from the sector of modern industrial technologies has been initiated in the United States. It was accompanied by activities to promote internationally limited public intervention in the economy in the spirit of the concept of *the night-watchman state* (through, e.g. deregulation, privatisation, removing barriers to international trade). This approach has been referred to as the *American Paradox* [Szymański 2011, Wade 2014].

countries and regions the creation of an effective system for supporting innovation is regarded [Gaczek 2005, Mazzucato 2015].

The policy aimed at the economic growth of regions has been pursued at the transnational level in Europe for several decades. From the very beginning, such activities have been underpinned by a belief that excessive socio-economic diversities constituted a barrier to the European integration [Czykier-Wierzba, 1998]. In the old paradigm of the regional policy, the central authorities usually directly supported less developed areas. This policy was based mainly on the redistribution of financial resources and the implementation of major infrastructure projects. The new approach applied in the EU is trying to build on the differences among individual territorial units and on supporting their inherent economic potential, as well as on launching bottom-up development processes with the use of multi-level management systems [McCann 2015]. In this context, the new regional policy, focused on innovation, territorially-oriented and included into the mainstream of public policy is developed [McCann and Ortega-Argiles 2013a]. This policy is based on an assumption that properly designed initiatives of the public authorities in the field of economy, science, spatial planning, and particularly industry and technology may foster innovation and contribute to the economic growth [Rodrik 2004]. The new approach to the public management has been reflected in the shape of the EU Cohesion Policy, whose priorities for the years 2014-2020 have become among others scientific research, technological development and innovation[3].

Smart specialisations are becoming an important instrument in achieving the socio-economic objectives of the EU. This concept has developed dynamically in recent years and attracted great interest on the part of representatives of the public authorities, scientific and business environments. In the beginning, it was discussed as one of the theoretical threads, but later it was adapted to the needs of the EU Cohesion Policy [McCann and Ortega-Argiles 2013b]. The implementation of smart specialisations in the EU is to combine the strategic assumptions and activities of the public policy at the supranational, national and regional levels, as well as to contribute to improving the efficient use of financial resources [EC 2010]. The single framework for the application of this instrument at all these above-mentioned levels makes this project unique on the scale of the EU and of the Member States [Morgan 2016].

[3] In 2014-2020 the amount of EUR 123 billion was provided for support the research and innovation projects, which accounts for more than one-third of the total budget of the cohesion policy. A significant share of these funds will be allocated within the European regions, in particular, the less developed areas, where investments in employment, enterprises, digital technologies or the environmental protection will be made [EC 2014].

The issue of smart specialisation in relation to rural areas[4] has not been often raised so far [Teräs et al. 2015]. In particular, there are no studies focused on an analysis of the methods, possibilities and potential effects of implementing regional innovation strategies based on smart specialisation (so-called third--generation regional innovation strategies – RIS 3). This issue is noteworthy for at least two reasons. A large part of rural areas in Europe and Poland is classified as areas with socio-economic problems, the source of which is the economic monofunctionality and basing on traditional sectors (agriculture, forestry, heavy industry). These sectors are regarded as not prospective fields of business activity due to the low potential of the productivity growth, level of employment and creation of environmental and social problems. In this context, the problem emerges relating to the basic assumption of smart specialisation concerning a need to link economic development strategies with resources or management methods which are traditional or relevant to the given regions. This approach constitutes a particular challenge for rural and agricultural areas as it means a need to support the process of modernising and diversifying the historically shaped production structures. The further part of the chapter describes the potential importance of smart specialisations in the regional development process. In particular, it describes how the strategy papers of the Polish voivodeships approach the issue of smart specialisation in relation to rural and agricultural areas which constitute their important part in spatial and economic terms.

The above issue is also worth considering due to the effectiveness and advisability of the use of the EU cohesion policy instruments in Poland. Regardless of the positive impact of EU funds on the national economy (e.g. GDP growth, improved quality of administration), it is noted that the existing ways of their use, particularly in the field of innovation and entrepreneurship, have not been optimal [Kapil et al. 2013]. They were often underpinned by an objective to maximise the use of state aid and to improve the quality of life (mainly investments in technical infrastructure) at the expense of support focused on modernisation and increased competitiveness, the aim of which is to trigger the demand effect [Kozak 2014]. The continuation of this approach may turn out to be unfavourable for least for two reasons. Firstly, in 2014-2020 Poland will receive

[4] The way of understanding the term *rural region*, applied in this chapter, refers to the Eurostat methodology (*urban-rural typology*). All EU regions at the NUTS3 level are divided into three types: predominantly urban (PU, rural), intermediate (IR) and predominantly rural (PR, urban). In this case the basis for the classification was the population density. In the Polish public statistics (CSO), these units are subregions. According to the Eurostat methodology, 24 of all 66 subregions in the country are classified as predominantly rural. In 2013, the EU-27 rural regions accounted for about one-fourth of all areas [Eurostat 2013]. The terms *rural region* and *rural area* are used interchangeably.

record-breaking support from the EU budget[5]. Support in the next financial perspective may be significantly lower, therefore, received aid funds should be allocated for the development. Secondly, a large part of support is to be allocated for research, innovation, cooperation of the business sector with scientific institutions, i.e. for complex projects. It is estimated that many existing projects in these areas, financed from EU support, have not fulfilled the assumed objectives. The reasons for this situation were, *inter alia*, failure to adapt individual initiatives to the local and regional specificities and needs of beneficiaries, as well as the imitation of solutions proven elsewhere [Karpińska 2016].

In this context, the opportunity and, at the same time, the challenge for the country and individual regions is a new policy of so-called smart specialisations. Its application determines not only access to financing innovative projects from EU funds, but also may be an important development stimulus. A key aspect of the smart specialisation mechanism is to identify the most important areas or sectors with the significant economic and innovation potential. In Poland, national and regional smart specialisations have already been identified. The further part of this chapter assesses this process from the point of view of the rural regions. It also indicates the opportunities and risks for these areas, which may be associated with the implementation of smart specialisations in the future. A major source of information for the analyses carried out were the data and information collected by the European Commission (hereinafter referred to as the Commission), Eurostat, and in particular the strategy papers of central and self-government administration bodies (Ministry of Development, Marshal Offices), including regional innovation strategies (RIS), regional development strategies, regional operational programmes (ROP) and other studies on smart specialisations.

2.2. The genesis and premises of smart specialisation

The issue of basing the economic development on innovation and research, which is a guiding principle of smart specialisation, has been recently reflected in the EU policies. Over the years, this idea has evolved and gained increasing interest (Figure 2.1). In the beginning, it was a theoretical reflection, then it took a form of pilot projects[6], and finally became an instrument for implementing the EU strategic objectives in all regions of the member states.

[5] Financial resources for Poland in that period, available from the European Structural and Investment Funds (ESIF) amount to EUR 86 billion. They are spent under 24 national and regional operational programmes [ESIF Founds 2016].

[6] Pilot programs aimed at developing a new approach to the economic and social development (based on cooperation and exchange of experience between various entities operating at the regional and local levels), as well as initiatives to promote innovation (creation of Regional

Figure 2.1. Evolution of smart specialisation in the EU

Source: own study based on [Charles et al. 2012, Landabaso and Reid 2013].

Some of the first attempts to apply smart specialisation in practice were made at the end of the 80s of the 20th century[7], when the European regions, in cooperation with the Commission, implemented pilot strategies and develop-

Innovation Strategies – RIS and Regional Technology Programmes – RTP) were implemented between 1994 and 1999, with support of the resources from the European Regional Development Fund – ERDF. However, the resources allocated for those projects were relatively small (0.6% of the total budget of this fund) [Landabaso and Reid 2003].

[7] Those activities consisted in making changes in the functioning of structural funds (with regard to the endogenous development and innovation), launching the STRIDE initiative (concerning the potential of the regions in the field of technology research and innovation), and then substantive and organisational support for the regions in creating the RTP *Regional Innovation and Technology Transfer Strategies* (RITTS) and RIS. The Commission also offered support in the innovation policy of the regions through *Regional Programmes of Innovative Actions* and through the *Regions of Knowledge* programme in the context of further framework programmes [Charles et al. 2012].

ment programmes, which later evolved into innovation strategies commonly adopted in the European regions. Morover, the institutions such as the World Bank and the OECD got involved in supporting that idea. The current shape of smart specialisations has been reconstructed and extended in connection with preparing the framework programme and objectives of the new EU budgetary perspective for the years 2014-2020[8]. At that time, the Commission recommended to national and self-government authorities of the Member States to reorient the development, innovation and research policy, to make changes in institutional systems related to that area and to focus regional innovation strategies on the concept of smart specialisation.

The requirement to include smart specialisation has become one of the *ex-ante* conditions for the use of financial resources provided for implementing the first objective of the Cohesion Policy through the operational programmes[9]. However, from the very beginning, the intention of this institution was to encourage the bottom-up preparation of this document and appropriate measures (Table 2.1). In 2011, the Commission created the Smart Specialisation Platform, whose mission is to support the authorities of the Member States and the regions in creating and implementing development strategies based on smart specialisation[10].

[8] The concept of smart specialisation was developed in detail in 2008 by the expert group (*Knowledge for Growth*) established in 2005 by Commissioner for Research J. Potocnik.

[9] For the years 2014-2020, 11 thematic objectives of the EU Cohesion Policy were set. Support from the ERDF resources was allocated for the implementation of all objectives, though priority is given to the thematic objective No 1 concerning the strengthening of research, technological development and innovation [EC 2014]. A prerequisite for access to this support is to formulate, at the level of the country and the region, smart specialisation strategies (based on analyses and monitoring, concentrating spending public funds on the priorities of research and innovation, activating involvement of private funds in innovation and consistent with the national reform programmes). Smart specialisation strategies may also be associated with the implementation of the thematic objective No 2 of the Cohesion Policy, i.e. increasing the availability, level of use and quality of information and communication technologies (e.g. broadband internet) [Regulation of the European Parliament and of the Council 2013].

[10] The platform in the form of an Internet portal, workshops, conferences and publishing activity is managed by the team of the Joint Research Centre (JRC) in Seville. It is formed by the Commission employees, representatives of regional authorities, universities, research centres, associations and experts. The JRC also provides data and information collected by the EU agendas (European Cluster Observatory, Regional Innovation Scoreboard, Region Innovation Monitor, Sectoral Innovation Watch).

It should be stressed that smart specialisation has been designed as one of the measures for the implementation of the most important EU development strategy Europe 2020[11] (Table 2.1). In that document, innovations are to be methods to solve basic economic problems (unemployment, slow growth and economic downturn, low competitiveness of enterprises), ecological problems (climate warming, increased pollution, depletion of resources) and social problems (ageing of the population), as well as are perceived as a basis for the future development.

Table 2.1. Selected premises of the development of smart specialisations in the EU

GENERAL (with regard to the EU competitiveness in the global market)	SPECIFIC (with regard to the EU cohesion policy and regional innovation strategies)
innovation gap between the EU economy and the economies of the USA and Japan	no supraregional and supranational perspective
no achievement of the Lisbon Strategy objectives	no establishment in the structure of the regional economy
smart specialisations are an important instrument of the current EU policy	no analysis of key resources and potential of the region
necessity to support innovation by the public policy (market failure; inappropriate regulations; spatial diversifications)	supporting operators doomed to success (*picking winners syndrome*)
criticism of the existing innovation policy (fragmentation of investments + identical approach to all regions)	imitation of solutions without taking account of the context

Source: own study based on [Charles et al. 2012, Foray 2012, Landabaso and Reid 2013, EC 2013].

In the context of strategic objectives, the priority of the EU policy has become smart, i.e. knowledge- and innovation-based, growth, as well as sustainable growth based on the low-carbon and competitive economy which effectively uses resources. In addition, the development with these attributes is to be accompanied by social inclusion, implemented particularly by high employment and the economic, social and territorial cohesion [EC 2010a]. Achieving these objectives is expressed in the model of the modern social market economy, as adopted by the EU. A key policy aimed at implementing the concept of smart specialisation is the regional policy, understood mainly as creating the right

[11] In addition to smart specialisation strategies, the smart growth is to be achieved based on tools such as: financial engineering instruments, interregional cooperation, public procurement or projects financed by EU funds.

conditions for pursuing economic and innovation activity, education, research [EC 2010b]. The regional management level is indicated as a key level of implementing the concept of smart specialisation. It has been selected due to its position in the EU institutional system, allowing to establish, maintain and develop the relationships (cooperation) among the public authorities and other stakeholders, including scientific research organisations, business and non-governmental organisations.

One of the important reasons for formulating the concept of smart specialisation involved the criticism of the existing innovation policy, regional and industrial policy, as well as the lack of implementing the strategic objectives relating to the improvement in innovation and competitiveness of the EU economy (provided for in the Lisbon Strategy and in the renewed Lisbon Strategy), particularly in relation to the economy of the United States and Japan [Szostak 2015, EC 2016b] (Table 2.1). The EU documents mention three conditions of a need for public intervention of authorities in relation to the area of knowledge and innovation, i.e. smart growth [EC 2010b]. The first of them involves the market failure, and in particular restricting positive externalities of private innovation, asymmetry of information, as well as the uncertainty of the results of activities in this field. The second reason for supporting this area by the EU institutions results from imperfect regulations at the level of the individual Member States and regions. The third reason for taking action on the issue of innovation concerns seeking the territorial sustainability of the process of disclosure and development of this phenomenon, which, by its nature, tends to focus on specific areas. Accumulation of new products or services involves not only the structure of the economy of individual areas but also the phenomenon of capturing public support geared towards innovation by the strongest entities [EC 2013]. The EU documents as the main barrier of insufficient innovation in the EU indicate the underdevelopment of the environment conducive to innovation, consisting of, *inter alia*: public education and innovation system; insufficient financial resources; regulations in the field of public procurement, patent protection, public-private partnerships (outdated, slow-changing regulations); activities of national and regional authorities [EC 2013].

An important reason for the development of smart specialisation was a need to revise the innovation support policy and, in particular, management systems in this regard (Table 2.1). In this context, what was important was the so-called EU territorial agenda, launched in 2011. Taking up this agenda was associated with noticing the growing polarisation of the socio-economic development in Europe (among and within the regions) and with a need to take account of the extensive approach to solving this problem. As part of that agenda,

a new perspective of the spatial diversities was declared and it was concluded that the situation of the poorer areas would not be considered through the prism of their constraints but of the characteristics understood as their opportunities or potential. The difference with respect to innovation in the individual Member States has resulted in a need to reduce this disproportion [EC 2008]. That is why, during the EU policy programming for the years 2014-2020, an emphasis was put on the instruments focused on the needs of a specific territory, defined as: *...a long-term strategy focused on overcoming the persistent failure to use the potential and permanent social exclusion in specific areas through intervention from outside and multi-level governance...* [Barca 2009]. As a result, a mechanism was created to help in using EU funds allocated for research, development and innovation. One of such tools is smart specialisation, which refers to the policy focused on a specific area and regarding innovation as the most important factor of development (place-based-innovation policy). In its assumptions, smart specialisation is to be free from three basic weaknesses of the previously pursued policy, namely: dispersion of aid, excessive eagerness in granting public funds, as well as unidimensionality of support, which often contributed to its ineffectiveness and to failure to adapt to the needs of specific areas and beneficiaries [Forray et al. 2012].

2.3. Definition and essence of smart specialisation

Smart specialisation is most generally the concept and practice of implementing the regional policy and innovation support policy[12]. According to the EU documents, the term *smart* refers to the economic growth, whose components are innovation and knowledge. In turn, specialisation concerns the integration and concentration of public support on selected areas and industries [EC 2010b][13]. In accordance with the assumptions of its authors, smart specialisation most often takes a form of strategies. In the EU policy programming period 2014-2020, they are referred to as national/regional research and innovation

[12] Definition of a smart specialisation strategy is contained in the EU legislation: *means the national or regional innovation strategies which set priorities in order to build competitive advantage by developing and matching research and innovation own strengths to business needs in order to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts; a smart specialisation strategy may take the form of, or be included in, a national or regional research and innovation (R&I) strategic policy framework* [Regulation of the EP and of the Council 2013].

[13] Innovation, in turn, is defined widely as new or improved products, processes, services, methods of organisation and cooperation, which result from activities open to participation of many various actors [EC 2010b]. An approach based on smart specialisation is to contribute to increasing the efficiency of inputs for innovation activities burdened with high risk.

strategies for smart specialisation (RIS 3). These are integrated and locally defined economic transformation programmes. Among the characteristics of these strategies, five characteristics are usually mentioned:

- ⇨ focus of support (within the framework of the investment policy) on the priorities, needs, challenges with regard to the knowledge-based development;
- ⇨ use of the potential, strengths, competitive advantages of a given region;
- ⇨ fostering innovation and private investment;
- ⇨ fostering the involvement of various stakeholders;
- ⇨ basing on objective data and evidence and on monitoring and evaluation systems [Forray et al., 2012].

According to the definition, a key assumption of smart specialisation strategies is the economic transformation of the region. It is understood as a transition from the old to the new sector, where the essential importance here is attributable not to the characteristics of the target area of economic activity but to the process of its selection, which is to be based on cooperation of various entities. On the other hand, the economic transformation may also mean modernising existing industries (understood as improving their efficiency and quality of the production), by means of specific measures, called key enabling technologies – KET[14] [Forray et al., 2012]. It should be added that selected specialisations should be historically associated with the given area. In the smart specialisation approach, the point is to use optimally the potential of the region (the principle of embedding into local conditions – place-based approach and embeddedness). In the programming documents regarding smart specialisation, the transformation is also referred to as the diversification aimed at triggering the synergy effects (expansion of a market offer) and indirect effects (spillover), formed from a combination of the new and existing key industry. What is important here is the so-called principle of relatedness, which consists in diversifying activity of companies, areas of management into related areas using new, innovative techniques and processes.

It should be noted that in the sparsely populated regions, with a small number of developed industries and companies, the process of selecting and implementing smart specialisation may be more difficult to carry out than in urbanised areas, with the modern structure of the economy. For these areas, it is recommended to involve scientific centres and strong public-private partnerships in creating and implementing development strategies.

[14] The key enabling technologies include, *inter alia*: micro/nanoelectronics, photonics, nanotechnology, industrial biotechnology, advanced materials and advanced manufacturing systems.

At the level of both of the country and individual regions, the authors of the concept of smart specialisation recommend to create innovation development strategies based on six stages. They consist of the following steps:

- ⇨ Analysis of the regional context and innovation potential. It concerns the resources of the region, its location and links with the environment and assessment of the state of enterprise (in this case, the following methods of analysis are suggested: SWOT, regional profiling, targeted surveys and expert studies, comparative studies, rounds of talks with other regions, and interregional working groups, technological audit, interviews with representatives of the management of clusters and companies, mixed working groups, observatories and organisations dealing with monitoring);
- ⇨ Creation of a strong management system with participation of various stakeholders. Management of RIS3 is to include, in a significant way, all interested parties (collective leadership), covering not only the industry, scientific research sector and public authorities, but also the consumers (market) and non-governmental sector;
- ⇨ Development of a common vision of the future for the region. This vision consists of development objectives accepted by all parties and properly justified;
- ⇨ Selection of a limited number of priorities for the regional development. These priorities should have a real chance of being implemented. In addition to specifying the specialisation niche, it is also necessary to define the horizontal priorities (enabling technologies and social and organisational innovation);
- ⇨ Preparing an appropriate set of policies and programmes. This part covers the rules and tools for achieving the objectives, schedule, budget, pilot projects;
- ⇨ Inclusion of the monitoring and assessment mechanisms. These elements should be an integral part of the strategy. Of key importance here is to define measurable objectives and a set of effects and indicators, covering baseline and target values. This makes it possible to update this document on a regular basis in connection with monitoring and assessment [Forray et al., 2012].

In the analyses of the regional context and innovation potential, regarded as essential in the entire process, great importance is also attached to the identification of market niches. Due to the unique characteristics of each country or region, the selection of the strategy should consist in involving in one of three sets of activities: using existing comparative advantages; supporting socio-economic transformations or catching up with others [Forray et al. 2012].

2.4. The concept of smart specialisation: a critique

Smart specialisations constitute the re-orientation of the existing EU regional policy. In its basic assumptions, this idea refers to various theories of the economic and regional development and innovation developed within the social sciences and is also a specific compilation of them (Table 2.2). Smart specialisations refer mainly to methods to build or maintain the competitiveness of the regions and the Member States on an international scale based on the export of goods and services [Hełpa-Słodowa 2013]. In this sense, the concept of smart specialisation has its source in the theories of the economic base, basic product, competitive advantages and new trade theory [Kardas 2011]. An essential factor to improve the competitive position in the domestic and foreign markets is, in this case, to launch or strengthen the bottom-up (endogenous) mechanism of the development based on various elements, such as natural, human and corporate resources, financial and social capital, social enterprise.

The concept of smart specialisation refers particularly to areas where so far the economic growth processes have been relatively slower and to areas which are economically dependent on wealthy metropolitan centres. In this context, the assumptions of this concept relate to, *inter alia*, the theories of clusters, industrial districts, network society and centres and peripheries [Grosse 2002]. Key competitiveness factors should be specific to the given area and in line with its historically shaped economic structure. Therefore, this approach seems to refer to new institutionalism and the path dependency theory. At the same time, in the perspective of smart specialisation, there is the necessity to implement the desired economic objectives and to enrich the existing potential of the region or country with using modern technologies and innovation, which makes the described concept closer to the theory of the production cycle or of the learning region. In the process of smart specialisations, the crucial role is assigned to the private sector. The task to identify and develop key and prospective industries for the region rests primarily on economic operators (broadly understood as organisations pursuing business, research, scientific, innovative activity).

According to the authors of smart specialisation concept, these entities may not only determine specialisations to the most accurate extent but also to implement them. The recognition and implementation of specialisations is to take place based on the so-called entrepreneurial process of discovery, consisting in experimenting. The risk of failure accompanying innovations is a reason for which a will to make them is usually small. Hence, in the concept of smart specialisations an important coordinating and activating role is to be played by national and regional authorities.

Table 2.2. Theoretical sources of the concept of smart specialisation

Theory	Assumptions	Representatives
economic base	Export as a main determinant of economic growth	H. Hoyt
comparative costs	Specialisation refers to goods, production of which is characterised by the greatest relative advantage in production costs	D. Ricardo
resource abundance	Specialisation is related to the size of resources of means of production	E. Hechscher, B. Ohlin
stable theory	Specialisation in highly competitive products for regional development	D. Ricardo; H. Innes
new trade theory	Entering the export market possible only for the most effective enterprises which leads to their further expansion	P. Krugman, M. Melitz
growth poles	Economic growth is concentrated on metropolitan areas	F. Perroux
geographical growth centres	Economic growth is unbalanced and concentrated	A. Hirschman
core and periphery	The competitive firms operate in most developed centres	J. Friedmann
production cycle	Innovative products and services are initiated in specific regions (scientific and research facilities, marketing, information, consumers)	R. Vernon
network society	Economy and societies function as a network	M. Castells
learning region	Knowledge and technologies are the most important resource for the region	R. Florida
flexible production	Change in corporate management systems, from Fordism to flexible production and specialisation	M. Piore; M. Sabel
industrial districts	Specialised industry often concentrate in one area what defines its economic and social characteristics	A. Marshall
clusters	Clusters of companies (network of cooperation and competition) in a given area affect the global competitiveness	M. Porter
competitive advantage	Competitive advantage is determined by the following factors: input, demand, related sectors, management models and competition within the sector	M. Porter
path-dependency	Evolution of the economy is defined by the institutions	D. North

Source: own study based on: Grosse T. [2002]; Kardas M. [2011]; Hełpa-Słodowa M. [2013].

In the concept of smart specialisation, key components are innovation and competitiveness. In the EU strategic documents, these factors are often treated as objectives *per se*, while justifying the reasonableness of actions taken. Increasing the competitiveness and innovation is also perceived as an adequate response to the modern times (often referred to as exceptional or critical) and an appropriate way to adapt to the current economic reality. Thus, this idea fits in

with the currently dominant development paradigm of the knowledge- and innovation-based economy. According to some researchers, initiation of this approach and an advantage in its implementation on a global scale is attributed to the economy of the USA, because it refers to the „reclassification" and valuing production of goods and provision of services, in which this country has the dominant competitive position [Zarycki 2014]. The paradigm of the knowledge- and innovation-based economy also fosters the economic structures, where the essential role is played by international corporations, which have had the greatest influence on innovation so far. This results from the fact that these entities largely decide what is widely recognised as a novelty due to their high symbolic power possession of significant economic capital (marketing), cultural capital (recognition in the scientific and media debate) and political capital (impact on public authorities). In this context, taking by the EU and the Member States and regions the economic competition based on external patterns and conditions of innovation and competitiveness may be problematic or difficult.

At the same time, the argument applied in the EU policy as regards increasing the competitiveness of the countries and regions involves a risk of the unbalanced distribution of budgetary resources, which are allocated mainly to the business sector. It is indicated that public entities whose purpose is the competitiveness and support for innovation in the private sector may not always fulfil the mission of the public authority aimed at striving for the socio-economic cohesion. Valuing the importance of the competitiveness associated with innovationism sanctions, in fact, the particular importance of companies in supporting the activities of public entities, is an obvious element of the socio-economic development [Zarycki 2014].

It is indicated that the concepts of the economic policy based on the theories of knowledge-based economy or innovationism, such as e.g. smart specialisation, may legitimise the specific pattern of distribution of economic rent. The above-mentioned distribution pattern generally fosters increasing participation in creating added value by symbolic capital to the detriment of industrial production and services, regardless of the complex and unpredictable nature of innovation and the diversity of factors influencing their creation.

An argument is raised that in the EU strategies, regardless of the declared objectives of the sustainable economic, social and environmental growth, the public policy based on innovation, knowledge and research may, by paradox, foster the polarisation processes in the economic and spatial dimension. There is a risk that due to the expensiveness of investments in new technologies, development processes will consolidate in the group of the largest companies (corporations) and in areas that so far have been development centres (agglomeration

effect). Most economic actors (small and medium-sized entities), due to their activity, minimise the risk, because due to the high costs, only a small part of them have funds for their creation and implementation of new product, organisational or process solutions. Concerns regarding the concentration on the development of one or more industries are associated with the eternal dilemma of risk of specialisation. There is no way to decide, to predict what specialisations will develop in the future. Hence, there is a risk to choose inappropriate areas, which is associated with the ineffectiveness of incurred inputs and creating a development barrier in the future.

Another objection aimed at smart specialisations in the context of their application in the regional policy boils down to the issue of internal contradiction and inconsistency of this concept. As shown by numerous analyses in the field of economic geography, specialisations „by nature" are an appropriate instrument for developed regions, as their effects depend on the degree of enterprise, diversification of the economy and the intensity of relationships between entities. Therefore, for peripheral, less developed areas, being a focus of the regional policy and EU Cohesion Policy, smart specialisations do not seem to be an adequate instrument which could simply even contribute to the deepening of their unfavourable economic position [McCann and Ortega-Argiles 2015]. In this context, the key issue is the method of adaptation of smart specialisation to the regional policy and to the needs of rural areas, which are usually peripheral areas. Targeting activities to improve the competitiveness of the region reflects the multi-dimensional and ambiguous problem of determining actual and desired hierarchisations in the sphere of economy, politics or social life. The regions can play various roles in the often proposed centro-peripheral stratification of the economic field [Zarycki 2007]. One of the methods to reduce their marginal status and activate development processes in specific areas is to define the field with regard to which the privileged position is taken. The objective of such activity is to strengthen the identity of the region and to overcome its adverse position[15]. One of the methods to accomplish this task may be smart specialisation.

2.5. Rural regions and smart specialisation

In many rural regions, the presence of persistent and accumulative barriers to development is well visible. These regions are often characterised by the low population density, limited transport accessibility, remoteness from urban centres, relatively lower level of the technical and social infrastructure develop-

[15] The greatest effect of the selection of economic specialisation will take place when this specialisation takes a symbolic dimension [Zarycki 2007].

ment. The unfavourable geographical location (generating high costs of transport and transactions), prevalence of industries with the relatively lower productivity, weaker links with economic growth centres (small and shallow markets, frequent mismatch between the supply and demand in the labour market), no agglomeration effect consisting in the mutual development and persistence of interrelated companies, adverse socio-demographic phenomena are the reasons for which the level of income and living conditions of residents of these areas are often lower than those of the population living in urbanised regions.

On the other hand, among the values of rural regions we usually mention the abundance of natural resources, high level of social capital, tourist and settlement attractiveness. Due to this potential, what is indicated as a formula for the acceleration of the economic development is support for the so-called green economy and, in particular, renewable energy (based on wind, biomass, water, solar energy), recreational and health tourism as well as production of organic and regional food. It should be stressed that, in addition to rural and urbanised regions, transformations also affect intermediate regions. The location attractiveness, lower costs of living and pursuing economic activity are the reasons for which the wealthy population, usually working in cities, migrates to rural areas more and more often. This is accompanied by an increase in production, extension of the service offer in local markets, as well as the intensification of investments which contribute to reducing spatial differences in the living standard of the population. Some of intermediate areas due to their favourable location, high level of development of production and service industries or equipment with valuable natural resources benefit from relationships with urban and industrialised centres. In other intermediate areas, due to the lack of impact of external economic incentives and capital deficit we may observe the similar and adverse trends as in the case of peripheral regions.

Among EU rural regions, significant differences are visible. Diversifications in terms of climate, environmental, economic and social conditions affect the level of spatial economic disparities and, to a large extent, set the future directions of the development of these areas. For this reason, for each rural region the economic policy based on smart specialisations may involve various restrictions, benefits and challenges (Table 2.3). Generally, it is stressed that the ways of understanding and applying smart specialisations are unclear and underspecified. This refers, in particular, to the regions which so far have not been associated with innovation, industries based on services and new technologies [Naldi et al. 2015]. It is stressed that due to the diversifications and specificities, smart specialisations established and implemented at the national and regional levels may not correspond to the needs of many local rural communities. In ad-

dition, the spatial impact of smart specialisations may be limited and focused on points (economic, administrative and economic centres in rural regions). Financial capital and new knowledge necessary to implement innovation (large scale of the activity of the R&D sector and enterprises) focuse, in fact, mostly on metropolitan areas and urban agglomerations.

Table 2.3. Opportunities and barriers in implementing smart specialisations in rural regions

OPPORTUNITIES	BARRIERS AND RISKS
Economic diversification and increased added value in traditional sectors based on innovation	Unclear importance and application in case of rural areas
Innovation-friendly structure and relationships of economic entities	Too small number of enterprises and agricultural holdings, including entities introducing innovation
Increased demand for products and services based on natural and environmental resources	Insufficient number of intermediate organisations
High level of trust and social capital of rural residents, large number of active non-governmental organisations	No capital for financing high risk ventures and initiating the bottom-up development
Concept of smart specialisation responds to the problems and needs of rural regions	Decisive impact on the process of establishing and implementing smart specialisations on the part of regional elites
	Smart specialisations do not take into account the specific nature and needs of diversified local communities
	Smart specialisations will deepen spatial disparities in the economic development due to the point concentration of innovation in metropolies

Source: own study based on [Foray et al. 2009, da Rosa 2014, Teräs et al. 2015, Naldi et al. 2015].

A threat to maximising social benefits in the region is also taking over the dominant role in identifying and practical implementing smart specialisations by a narrow group of representatives of the economic, scientific or institutional environments. In this context, the challenge for the actors from local and peripheral communities is active involvement in the entrepreneurial process of discovery, through e.g.: formulating a common position on the proposed development strategies or influencing decisions on the allocation of state support. It is stressed that the existing instruments of the EU Cohesion Policy focused mainly

on the region and often did not respond to the needs of entities from rural areas [Nurzyńska 2014].

Barriers to the application of smart specialisations in many rural regions are of supply nature. It is indicated that the number of enterprises (large, medium-sized, and small) and relevant institutions in rural regions is too small [Teräs et al. 2015]. Apart from few large entities (usually from the agri-food industry, investing in research and development), the countryside is dominated by small and micro-companies and agricultural holdings which are dispersed, operate on a limited scale and rarely put new solutions into economic practice. One of the reasons for the low level of innovation of these entities is the absence of support from organisations responsible for mediation in the exchange of new knowledge and for adaptation of this information to the local context. Implementing innovation is also limited by the lack of capital. It is indicated that institutions offering financial resources for higher risk projects usually do not operate in underdeveloped local markets. In addition, due to significant distances and the relatively less developed transport network, cooperation of enterprises, scientific research organisations and enabling institutions is an organisational difficulty and forces alternative forms of contacts.

Regardless of the risks of deepening the economic disparities and reducing the positive externalities of innovation due to the implementation of smart specialisations, several benefits are mentioned which in connection with their application may be gained by rural regions. One of the positive aspects related to the implementation of this instrument is its flexibility in addressing state support to industries and fields deeply rooted in the economic structure of the given area, but at the same time is focused on their modernisation and increasing innovation. The objective of such an approach (based on reconfiguration and reconceptualisation of manufactured products and services) is to increase the competitiveness of domestic economic entities. For rural and agricultural areas, the development base is natural resources (land, forests, landscape, flora and fauna). Production and service activity pursued based on these resources is an important part of its economy. Therefore, the concept and practice of smart specialisation rules out the scenario of the thorough structural reconstruction and direct incorporation of external economic solutions. A chance to activate the economic growth in rural regions is seen in combining technical, technological, organisational, process solution from various fields. Their application in industries typical of the rural economy may increase the added value of products and services produced under this economy. Also, in case of many rural regions the obvious domain of economic activity are natural and environmental resources which are rare goods. In connection with the growing demand for products and services

related to rural economic entities, these entities should focus their activities on innovative and optimal forms of use of these resources. An example of such activities are tourist, health, recreational services, production of organic and traditional food, handcrafts or providing cultural services (e.g. festivals) [Naldi et al. 2015]. The demand for these products and services is reported in particular by the so-called new middle class which increasingly chooses the countryside as a place to live and rest [Halamska 2015]. The progressive gentrification of rural areas is therefore a chance to the significant deepening of local markets from the demand and supply side.

It is argued that the implementation of smart specialisations may be beneficial for rural regions due to the structure of economic entities and their interrelations [Teräs et al. 2015]. In fact, this structure is often based on a large, dominant agri-food enterprise (multinational corporation) and a number of cooperating small production and service entities, creating the natural multi-industry cooperation environment that is conducive to innovation. Corporations and large enterprises from the agri-food industry may also be a source of knowledge, technologies, solutions applied on a global scale, and at the same time they give small entities a chance to become included into the national and transnational economic circulation.

Some researchers indicate the far-reaching similarity between the modern theories of rural development and the concept of smart specialisation of regions [da Rosa Pires et al., 2014]. The authors of the latter decided that it is beneficial for both leader regions and follower regions. In this approach, it is assumed that by concentrating on modern industries, determining the state of the economy, leader regions strengthen their position. In turn, their followers should focus on creating innovations for the purpose of their implementation [Forray et al. 2009]. One of the main characteristics of smart specialisations is a condition, that they should apply to all regions, as well as openness (inclusiveness) to each proposed development programme. Hence, it is believed that the cohesion policy based on this concept will support all administrative units, including those of rural and agricultural nature.

Smart specialisations constitute a significant change in the approach to the public policy oriented towards innovation in rural areas [da Rosa et al., 2014]. The previous approaches considered innovation as a technological phenomenon specific to urban centres saturated with the activity of companies and research and education institutions. Now, the innovation-oriented activity is understood more extensively as support for new social solutions, based on collective activity (social capital) in the local context, and the promotion of modern production and service concepts carried out in small and local markets [da Rosa et al., 2014].

Taking into account the large saturation of social and economic problems in rural regions, these areas are seen as the space fostering the emergence of projects designed for their effective solution. In this context, an important resource of local communities is mutual trust, will to cooperate and high activity of non-governmental organisations. The adequacy of smart specialisation to the needs of rural regions is confirmed by the results of the initial research on the process of their emergence in the regions. In most European countries, the sectors referred to as traditional and typically rural, such as agriculture, forestry, fisheries, agri-food industry, tourism, were often indicated as areas which will have the greatest impact on the socio-economic development (economic growth and employment) in the following years [Wintjes and Hollanders 2010]. However, the rural areas development policy based on smart specialisations should take into account the combinations of instruments and both endogenous and exogenous resources. Innovation systems are built to include the creation of conditions for the development of specialised clusters, local and regional public-private partnerships, mergers of entities from various industries, searching for market niches or using unique advantages and facilities. Also, these systems should be open to innovation and new actors from outside the region (technology, knowledge) [Naldi et al. 2015].

2.6. Implementing national and regional smart specialisations: the case of Polish rural regions

A change in the approach in the EU cohesion policy based on smart specialisations has been reflected in the Polish development policy. In the strategy papers at the central and regional levels, as well as in the operational programmes, political and expert debate, the issue of smart specialisations started being taken into account (Figure 2.2). At the same time, many expert, scientific and popularisation studies have been drawn up, which broadly describe this subject and point to the ways of implementing the new instrument of the Cohesion Policy [Kardas 2011, Hełpa-Słodowa 2013, Wyrwa 2014].

At the national level, the identification of smart specialisations has been initiated by starting research projects and updating the strategy papers regarding scientific research[16]. In the years 2012-2013, under the auspices of three ministries, workshops and meetings were held with the representatives of industrial

[16] This refers to the project *National Foresight Programme Poland 2020* and updating the National Research Programme.

sectors, economic operators and researchers, which were aimed at discussions around the future development model of the Polish economy[17].

Priority areas for research and investment in terms of future specialisations were also determined at the central level on a basis of an analysis of clusters, as well as on a basis of the pilot research programme among economic actors, carried out by the World Bank experts[18].

Figure 2.2. Implementation of smart specialisations in Poland

Source: own study.

[17] 14 industry meetings with 87 representatives of those environments were organised, the methods of brainstorm, STEEP and SWOT analysis, expert panel and Delphi method were used.

[18] The research project of the World Bank related to creating a proposal for a model of entrepreneurial discovery of sectors, fields which are to be the subject of support of the innovation policy. For this purpose, interviews, laboratories, workshops, consultations were carried out with different entities (stakeholders), i.e. mainly with companies, central and regional institutions [World Bank 2016].

Work involving the final selection of smart specialisations was taken up by the institutions designated for this purpose (working groups for national smart specialisations – NSS and Economic Observatory) [European funds in Poland, 2016]. National smart specialisations were adopted in 2014[19]. They included 19 fields within five thematic areas. Currently, smart specialisations in Poland consist of 21 fields, grouped into five thematic sections: healthy society, agri-food, forest-wood and environmental bioeconomy; sustainable energy, natural raw materials and waste management, innovative technologies and industrial processes (Figure 2.3).

Figure 2.3. Thematic sections of national smart specialisation in Poland (NSS)

Source: http://www.smart.gov.pl/pl (as of July 2016).

One thematic section (agri-food, forest-wood and environmental bioeconomy) and 3 specialisations apply to the agri-food sector and are closely connected with the economy of rural areas (innovative technologies, processes and products of the agri-food and forest-wood sectors, high quality food, biotechnological processes and products of specialist chemistry and environmental engi-

[19] Back then, the Council of Ministers approved the *Enterprise Development Programme*. One of the components of that document was the study *National Smart Specialisation (NSS)*, which contains a list of sectors, fields being smart specialisations.

neering). In 2014-2020, at the central level, the most important instrument for implementing the innovation policy and smart specialisations will be the Smart Growth Operational Programme (SG)[20] and regional operational programmes.

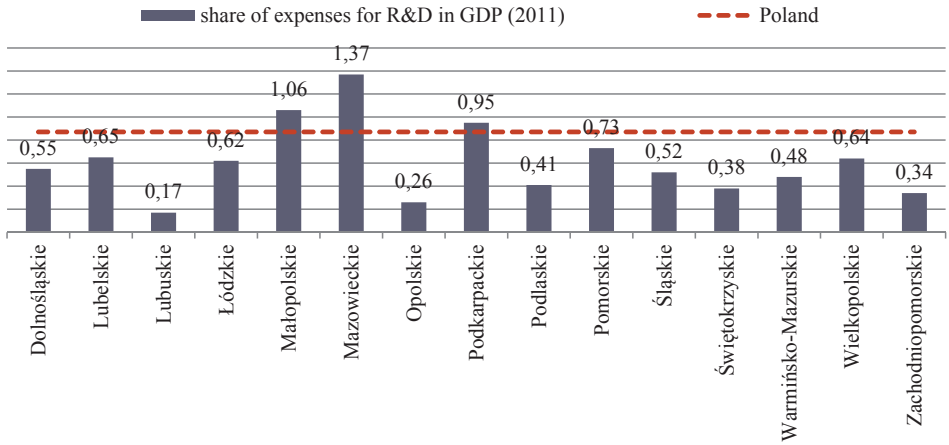
A large part of the regions in Poland have been classified as rural regions, characterised by the low or very low level of innovation [Eurostat 2013, European Innovation Scoreboard 2016]. In international comparisons, they were described as areas with limited access to new knowledge, as well as with the small scale of its absorption and popularisation [Wintjes and Hollanders 2010]. Intensity of R&D inputs in all voivodships in Poland was lower than the EU average. In 2011, the average share of those inputs in GDP of the regions accounted for 0.87%, while in the EU-28 it reached the average level of 2.01% of GDP. In addition, the scale of expenses for research and development in the individual voivodeships was varied (Figure 2.4). The largest part of GDP for this objective was allocated in the following voivodeships: Mazowieckie (1.37%), Małopolskie (1.06%) and Podkarpackie (0.95%), and smallest in the following voivodeships: Lubuskie (0.17%), Opolskie (0.26%) and Zachodniopomorskie (0.34%). In general, expenses for research and development were incurred from public funds and applied to universities.

It is estimated that in the Polish regions, too low inputs for innovation were implemented in enterprises, and the mere creative and innovation industries were underdeveloped [World Bank 2016]. This was accompanied by the high level of employment in the industry, simple services and agriculture. This does not change the fact that in many regions an increase in the number of employees in the sector of advanced and intermediate-advanced technologies has been recorded. This was supprted by the availability of properly qualified staff (with at least secondary education). A favourable phenomenon for the economy was also locating investments based on productive technologies by enterprises from Western Europe. This translated into the activation of local entities as well as into an increase in average remunerations. The latter, however, were still far lower than in the economically developed regions. It is indicated that from the

[20] The relationship between OP and smart specialisations results from the fact that one of the conditions for co-financing projects under the selected measures of the programme is the fact that they correspond to the areas of National Smart Specialisation. At the same time, the resources of this programme will be used to create a system to monitor and update smart specialisations at the national and regional levels. The purpose of SGOP is to encourage Polish enterprises to increase financial and labour inputs for research, development and implementation, which is to contribute to increasing employment, placing innovative products and services on the market, which will result in the economic growth and improved competitiveness of Poland. The objectives of the programme provide for support for 12 thousand entities and creating 20.5 thousand jobs [Smart Growth Operational Programme 2014-2020, 2015].

point of view of the development strategy for this group of regions, public support is necessary for the development of knowledge and technology in private entities (new technologies clearly contributed there to the economic growth), the creation of research and development infrastructure and friendly environment for this activity, as well as the acquisition of capital [Wintjes, Hollanders 2010].

Figure 2.4. Share of expenses for research and development in GDP of the voivodeships in Poland in 2011 (in %)



Source: own study based on the data from the Joint Research Centre 2015.

As a result of the local government reform and integration with the EU, Poland has adopted a decentralised model of pursuing the regional policy, which involved not only equipping the regional authorities with relevant management instruments, but also providing financial resources necessary for its implementation. The process of creating innovation support systems took place even before Poland's accession to the EU[21]. In case of some voivodeships, institutional systems for innovation were created, so were the conditions for supporting industries with the high competitiveness potential. Along with preparing the financial and legal framework for the years 2014-2020 and shaping the new institutional and policy framework in the EU, the voivodeships in Poland started the process of updating regional innovation strategies or creating appropriate strategy papers anew. The analyses carried out show that all voivodeships defined smart specialisations in strategy papers they had prepared. It was accompanied by a significant institutional effort and financial inputs related to the creation of systems to

[21] In 2001-2002, innovation strategies were adopted in the voivoveships (Wielkopolskie, Opolskie, Śląskie, Zachodniopomorskie and Warmińsko-Mazurskie).

support innovation and new strategy papers. It is estimated that in most cases, the direction and shape of the above-mentioned solutions was correct [Kogut-Jaworska 2015].

It should be pointed out that in most voivodeships too many industries were selected as smart specialisation. This move may be associated with a will to achieve flexibility and enhance opportunities for support of regional contracts on the part of the EU authorities and national authorities. The funds available under the Cohesion Policy may not be sufficient to support such a large number of specialisations.

In Poland the implementation of smart specialisations by renewing old strategies or creating new encounters difficulties. Despite the declared implementation of the objectives of this concept, in fact the relevant principles and mechanisms of this instrument are not observed [Szostak 2015]. The practice of partial copying solutions of other regions was often applied. The voivodeships selected similar development priorities, focusing on the most popular technologies.

At the moment, it is difficult to assess to what extent the process of identifying and implementing specialisations in the regions has been dominated by narrow interest groups. Most of the voivodeships, which is in line with the concept of smart specialisation, have retained the current path of development. Haste and imitation of solutions in some regions may indicate the anti-development approach to public support from the EU funds. It consists in concentrating on the amount of spent funds and not on the quality of their use. The problem with implementing smart specialisation may be, in the Polish conditions, the distribution of powers within the administrative system. Entities responsible for the development of the regions are self-government authorities, which have a limited impact on the essential link in the innovation system, i.e. the research and scientific sector and universities, which is referred to as the responsibility paradox.

In Polish voivodeships, regional innovation strategies based on smart specializations or other documents referring to these topics, have been prepared in order to increase the region's innovation, and also in connection with the need to fulfil the condition for using EU funds focused on supporting innovation as part of the cohesion policy for 2014-2020. By the end of 2016, all regions have identified intelligent specializations and adopted relevant strategic documents. The issues of smart specialization in the scope of premises and identification methods, the implementation system (instruments, institutions), the action plan, financing sources, and the monitoring and evaluation system, were generally included in regional innovation strategies, or in separate documents. In all cases it was declared that identification of smart specializations (process of entrepre-

neurial discovery) has been carried out in accordance with the methodology developed at the EU level, i.e. based on objective data and tools (data analysis, SWOT, interviews, surveys), and with the use of social consultations conducted with representatives of various groups (entrepreneurs, administration, scientists, associations). Generally this process was supported by subsidies from EU funds available from the previous financial perspective (so-called systemic projects under central and voivodeship operational programmes). For the vast majority of voivodeships, the selected priority support areas, which constitute the strong side and economic potential, setting their competitive position, were related only to agriculture, agri-food industry, and business operations closely related with rural areas (e.g. agritourism, health tourism and recreation, forestry, energy production from renewable sources). The aforementioned operations did not become smart specializations only in the Śląskie and Pomorskie voivodeships.

The accepted documents, which included the issue of smart specializations (in most cases regional innovation strategies), were diverse, both in terms of the volume, methodology of entrepreneurial process of discovery, implementation system concepts, as well as monitoring and evaluation. Normally, these documents were consistent with the clearly distinguished diagnostic part, the description of strategic goals and instruments for achieving them, the characteristics of implementation institutional system, financing sources, as well as efficiency and effectiveness evaluation. In this context, the significant progress should be noted, as compared the previous strategic documents prepared in voivodeships between 2002 and 2005, both in the scope of compliance of the diagnosis and assumed goals, as well as precision and quality of the implementation layer (schedule and implementation system, outlays for pilot programmes, implementation monitoring) [Gorzelak et al. 2007].

Nonetheless, in the case of some voivodeships, the documents related to smart specializations were not optimally prepared, which was manifested by a generality of statements, lack of indication of specific instruments for implementation or balance among individual parts (Kujawsko-Pomorskie, Mazowieckie, Lubuskie, Dolnośląskie voivodeships). This was particularly noticeable in the case of some voivodeships with smart specializations in the scope of the agri-food sector, and economic activities related to rural areas. Analyses of the documents indicated that the selecting of specialization in the designated areas, was not accompanied by a deepened analysis and diagnosis of the limited innovation (economic problems), nor a sufficient number of specific activities and instruments fostering improvement. It is worth adding that every time, the identification of smart specializations involved acknowledging the weight of a particular area for the socio-economic future of the voivodeship. Nonetheless,

attention should be given to the high level, consistency and precision of documents concerning smart specializations, both in the layer of assumptions and implementation issues, in the case of regions often associated with the agri-food sector and rural areas (Podkarpackie, Podlaskie, Świętokrzyskie, Warmińsko-Mazurskie and Wielkopolskie Voivodeships).

The fact that a majority of voivodeships identified quite a large number of intelligent specializations may also be evaluated differently. According to the Commission's methodology, specialization should encompass one, two, or at most three areas being priorities, which is an important condition for effective support, which is based on concentrating funds on specific areas. It should be assumed that a justification for selecting several or more fields was a desire to retain flexibility, limit the risk of wrong decisions, and a lack of experiences in the scope of new regulations of the cohesion policy. Similar remarks may be formulated with regards to national smart specializations and their compliance with regional specializations. The reason being that in a part of the cases, voivodship specializations do not correspond to specializations selected at the central level.

The analysed information regarding smart national and voivodship specializations included the data from 2012-2016. During that time, intelligent specializations were identified, relevant strategic documents adopted, and activity schedules prepared. Implementing operational programmes at the national and voivodeship level, were in the initial stages of the advanced phase (this applies particularly to RPO). Therefore, it is too early to assess the impact of smart specializations on rural regions. In this context, we can outline only potential opportunities and risks associated with the implementation of this instrument. The effectiveness of stimulating the socio-economic development of rural areas due to innovations, shall to a decisive extent depend on the activity business entities from those areas in the field of research, innovation and acquiring support for introducing new solutions into their business practices. An important role in taking advantage of the possibility of specialization should be ascribed also to institutions responsible for the regional innovation support systems, as well as to the effects of activities undertaken in research and scientific organizations. The emphasis is invariably put on the fact that the condition for increasing innovation of the national economy, is to intensify contacts between the world of science and research, and the business sector, as well as a significant increase in adapting the results of scientific research to business practice.

The analysis of regional innovation strategies and documents relating to smart specialisations showed that in most cases, the problems of rural and agricultural areas were not given much attention. Moreover, no special instruments,

actions or methods to support innovation in these areas were proposed. Such a situation was observed regardless of the fact that most voivodeships selected specialisations based on natural resources (land, forests, water, fauna, flora, crops, clean air, landscape, bio-raw materials) and sectors (agriculture, agri-food processing, bioeconomy, production of safe food with high quality values) typical of rural regions, which are relevant to its future development.

Chapter 3
Changes in relations of resources and production factors

3.1. Introduction

The development processes taking place, are closely linked to the diminishing importance of agriculture in modern economies [Tomczak 2004], which is reflected not only in the constant decrease of the significance of this sector in generating the Gross Domestic Product (GDP) in various states [Skodlarski, Materna 2005], but also in food production (mainly including resources for production) and employment, as well as a systematic reduction of the share of agricultural production assets, and the incurred investment outlays for the development thereof [Bear-Nawrocka, Poczta 2016]. This universal norm does not automatically mean the social and economic exclusion of agriculture [Woś 1999]. The reason being, that systematically decreasing amounts of production resources in agriculture should normally be accompanied by structural changes, improving the efficiency of their use [Woś 1999].

Simultaneously, issues related to the place of agriculture in economic macrostructures are specific and connected mainly with the importance of that sector in fulfilling basic human consumer needs. For this reason, a common pursuit is ensuring food safety. Meeting this condition determines the need for agricultural activities, which allows obtaining such a quantity and quality of agricultural production, so as to satisfy the economic needs at least on a basic level. Additionally, in recent time, emphasis is increasingly often put also on the nodal meaning of agriculture for providing public goods, especially for environmental protection and preserving the natural landscape qualities, as well as on the significant contribution of this economic segment to the resilience of rural areas [Zegar 2005].

Agricultural activity is inseparable from the production factor resources (especially land), which may be related to one another in various ways. These proportions are determined by multiple factors, and especially the surface of the arable land resource (total and *per capita*), climate, state economic and social development level, farming population, economic policy.

The amount of possessed production factor resources (land, work, capital), along with their qualitative characteristics, and interdependencies (relations), determine the production potential of agriculture. In agricultural activity, it is the proportion of production factors, which is connected to the entire production process, the level of which is, to a significant extent, dependant on work efficiency [Poczta, Kołodziejczak 2002]. The relations shaped are additionally

the main element co-defining the type and structure of agriculture, the productivity of production factors, agricultural production size, and even the scope of relations between agriculture and other agribusiness branches, e.g. processing industry, agricultural trade, etc. [Poczta 2003].

Resources of agricultural production factors may contribute to improving the economic situation of agricultural holdings, or constitute a limitation of the possibilities of such a change [Kołodziejczak 2014]. Of key importance is their adjustment to the attainable agricultural production, so as to achieve a high effectiveness of the use thereof. Polish agriculture finds itself, in this instance, in a relatively unfavourable situation, caused first of all by a disproportionately large amount of labour in relation to the agricultural production obtained.

Poland's accession to the European Union (EU) and the related modernization of agriculture, contributed to a certain improvement of the relation between production factor resources and the economic effects thereof, however, the distance separating between Polish agriculture and that of other EU states is still considerable. The scale of these differences indicates an area of necessary adjustments, particularly in the situation of unbalance between resources of these factors and possibilities of the use thereof, which in the case of Polish agriculture especially relates to labour resources [Poczta, Kołodziejczak 2004].

3.2. Empirical material, methodological assumptions and purpose of the study

The analyses in the present chapter uses the various empirical sources. Primarily, the material was comprised of statistical data (GUS and Eurostat), supplemented with the results of panel field research (every 4-6 years) conducted by the IAFE-NRI, mainly from 2000, 2005 and 2011. This surveys covered all agricultural holdings with more than 1 ha of agricultural land (UR)[22], at the disposal of natural persons[23], i.e. individual agricultural holdings, being *de facto* family farms [Sikorska 2014]. Examined entities[24] were located in the same 76 villages from different regions of the country. The villages had been selected purposely, so that the area of the surveyed holdings was proportional to the actual area structure of individual agricultural holdings, both at the country level and the macro-region perspective [Sikorska 2001]. Due to the fact that in Polish agriculture the farm size is still strongly associated with other holding features

[22] In accordance with the act on on the formation of agricultural system, a farm should possess at least 1 ha of UAA.
[23] Despite certain conceptual differences, the names family agricultural holding and individual agricultural holding, as well as holding and entity are used interchangeably.
[24] The paper uses the definitions: agricultural holding and entity interchangeably.

[Zegar 2009, Dudek 2010, Karwat-Woźniak 2011], and even the environmental balancing level [Zegar 2009], it may be assumed that the community tested possesses the quality of representativeness.

Each time, the surveyed entities constituted ca. 0.2% of the actual number of individual agricultural holdings, and their number of in the last study (2011) was over 3.3 thousand, and all of them (99.7%) conducted agricultural activities. Empirical data used in the analysis, each time concerned the crop year, or the status as of the end thereof, which herein shall be given in a shortened form, e.g. 2011.

The purpose of the chapter is to analyse the changes in production factor resources and their mutual relationships, from the perspective of the entire Polish agriculture, and that of individual groups (types, categories) of agricultural holdings, according to their market activity.

When considering the market activity of an agricultural holding, and thus defining its type, multiple criteria may be used, including the size criterion (value) of goods production[25], the value of which is determined arbitrarily in absolute volumes [*Production Goals* …. 2004, *Economic Report* …. 2006], or with the use of relative measures, designated on the basis of the relations between the goods production value of individual entities with regards to the average production level placed on the market by the entire studied group [Szemberg 1991], or to the final [*Market activities*…. 2013] or global [Rychlik, Kosieradzki 1981] production value.

The present chapter, in order to determine the market activity of individual holdings, makes use of the criterion of agricultural goods production (value of agricultural production sold in the crop year). Assuming the main criterion for the division of production sales volume from individual agricultural holdings, which is simultaneously, one of the most important determinants of their economic strength [Woś 1998], to be the general economic development and market position [Adamowski 1998], two basic segments of individual agricultural holdings have been distinguished:

- ⇨ **without contacts** (connections) **with the market** of agricultural products, which were entities producing only for own needs (subsistence), i.e. conducting agricultural activities, and with no sales of their production;
- ⇨ **in contact with the market of agricultural products**, which was comprised by farms selling agricultural products. Among these holdings, two subgroups can be distinguished: **holdings producing mainly for subsistence** (own needs), and **holdings producing mainly for trade** (for the market), **i.e. commercial holdings**.

[25] The criterion of commercial production is also used for grouping holdings in accordance with the purpose of conducted agricultural activities, or their relation with the market.

When setting the limit values of goods production size, defining affiliation with one of the aforementioned subgroups, the guiding principle was the relation of the value of agricultural production of a given entity, to the average value of production sold *per* 1 holding locating its production on the market in the entire sample in a given year. This ratio was PLN 25.0 thousand in 2000, in 2005 – PLN 36.4 thousand, and in 2011 – PLN 51.0 thousand. It has been assumed that entities with the value of production not reaching 20% of the average level for one period, should be included to the mainly **self-subsistence holdings**, and therefore not market-focused. On the other hand, entities producing at the level at least equal to the limit value, have been qualified as the commercial subgroup, **i.e. market-oriented**. Furthermore, in the commercial holdings group, entities may be further distinguished, with the size of agricultural production allowing them to obtain an income from work in the used holding, *per* 1 fully employed person, at the level at least equal to average earnings in non-agricultural sectors. So determined production volume, was at least double the average sales value from a holding in a given time, and entities meeting this criterion were defined as **highly-commercial farms**. These holdings, due to the attained income and management efficiency, had competitive potential. As a result, following the activity criterion, four types (categories) of agricultural holdings have been distinguished, i.e. /1/ **exclusively** and /2/ **mainly subsistence**, /3/ **commercial** and /4/ **highly commercial**. The analysed presented in this chapter uses of the methods of statistical and comparative analysis, particularily descriptive statistics and structure and dynamics indicators.

The analysis concerns the years when Polish agriculture was within the Common Agricultural Policy (CAP) system, for which relevant data is available. In certain cases, analysed time span has been extended to the years prior to Poland's accession to European structures. This was due to the available empirical material used for the purpose of this study, and the fact that at the beginning of the 21st century, a change occurred of the functioning conditions connected with the integration with the EU market [Józwiak 2013].

3.3. Changes in the resources (inputs) of agricultural production factors

Tangible and intangible resources, which are used for producing particular goods or services, are called production factors[26] [Begg, Fisher, Dobrnbusch

[26] The notion production factors has been introduced by Adam Smith and developed by David Riccardo and John Stuart Mill, and became the basis for political economy.

2007]. In a classical economic approach, three basic production factors may be distinguished[27] such as:

- ⇨ labour input (manual and managerial) put into the production of goods and services, and comprising the creative and organizational force of production processes;
- ⇨ capital[28] – goods produced beforehand (machines, buildings and structures, infrastructure, or knowledge, experience and even monetary resources);
- ⇨ land – soil and other natural goods (water, insolation etc.).

Production factors are used jointly in the manufacturing process. They usually strengthen their productivity and therefore, albeit to a certain extent, they are complementary. In certain cases, production factors are interchangeable and may compete with one another, instead of complimenting each other [Woś 1996, Kowalski 1998].

3.3.1. Agricultural land

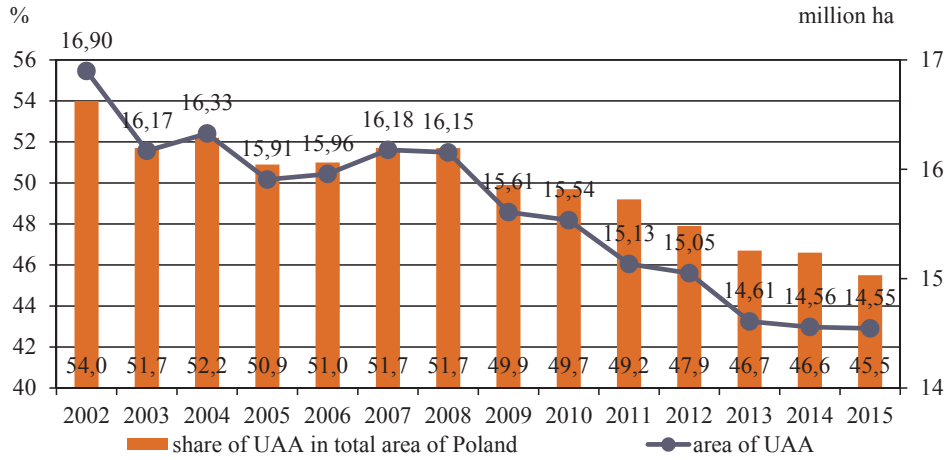
Agricultural land is the basic means of production in agricultural activity, fulfilling a double function in the production process. On the one hand, land creates an area, where an agricultural holding is located, and on the other hand, actively participates in the process of producing agricultural raw materials[29]. Additionally, it is a special type of production factor, because it has its own production potential, whose size, if competently used, is not reduced, but may even grow [Kowalski 1998]. Simultaneously, unlike other goods used in the agricultural production process, it is not subject to the process of displacement, multiplication, consumption [Zegar 1998].

[27] In addition to the three traditional production factors, a fourth one was introduced: A. Marshall considered the organization, and J. Schumpeter – entrepreneurship. Contemporary analyses sometimes use only two production factors – human labour and capital, with the latter, in that case, also including land as a fixed asset [Milewski, Kwiatkowski 2005].

[28] In classical economics, the capital was comprised of tools and machines, which presently is defined as physical capital, currently no less important, and generally of more importance is human capital, usually meaning knowledge and skills of the workforce.

[29] Land is a part of all production processes. From an agricultural perspective, fundamental importance is attributed only to land understood as an area, but also soil, i.e. the surface layer of land, useful in agricultural production. Although, along with technological development, the importance of land in agricultural activities is decreasing, its consideration in agriculture as agricultural land (arable land, orchards, permanent grasslands) is, except for human labour, the most vital production factor in agriculture [Woś 1996].

Figure 3.1. Changes in agricultural land resources in agricultural holdings



Source: Statistical Yearbook of Agriculture and Rural Areas (relevant yearbooks) GUS, Warsaw.

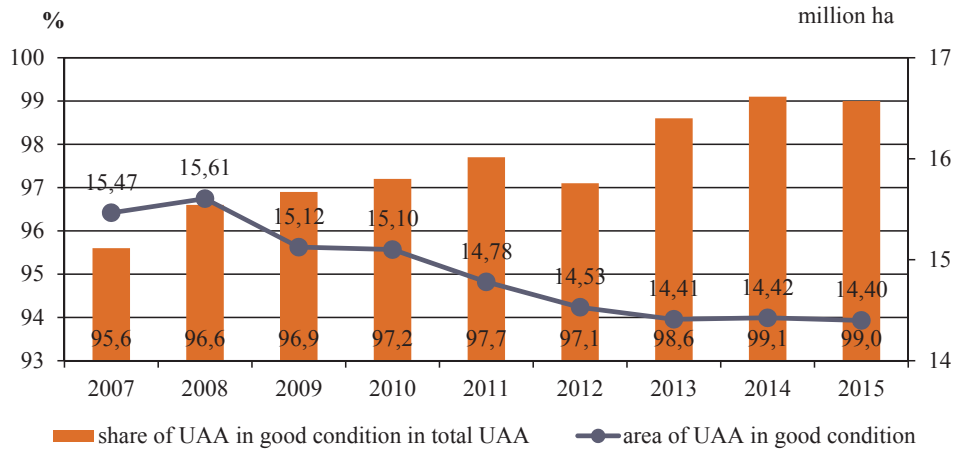
Agricultural land resources are subject to relatively large changes. That phenomenon is caused by economic and social matters. Additionally, along with the economic development, it is necessary to reduce the area of agricultural land. In Poland, it is continuous, occurring with varying intensity in individual periods, and shaped under the influence of various conditions (political, social, environmental, economic etc.) [Kluba 2013]. As a result, the lands for agricultural use is becoming more and more limited (Figure 3.1).

In Poland, in 2002-2015, the acreage of agricultural land used for farming[30] has decreased from 16.90 to 14.55 million ha, by 13.9%. This means that annually, agricultural land resources were reduced by over 1.2%, i.e. almost 90 thousand ha. A consequence of this process was reduced share of agricultural land used for farming in the total area of the country, which dropped from 54.0% in 2002, to 45.5% in 2015.

Agricultural land resources at the disposal of Polish farmers, despite relatively strong processes of their conversion for non-agricultural use in the 21st century, should be considered as relatively high. In 2014, they constituted 8.3% of the total UAA in the EU-28. Agricultural land resources larger than in Poland, had only four EU states, i.e. Germany (9.6%), UK (9.8%), Spain (13.4%) and France (15.9%).

[30] Agricultural land used for farming (UAA) shall be deemed land constituting agricultural holdings and have been defined with the same term (in Polish – użytki rolne UR). They usually constitute only a part of the general area of land, which for reasons of its properties may be cultivated. According to the PSR 2010 results, more than 82% of the overall area of agricultural land has been allocated to farming.

Figure 3.2. Agricultural land in good condition in Poland



Source: prepared on the basis of the Concise Statistical Yearbook (for relevant years) GUS.

Regardless of changes in the area of agricultural land, the share thereof being part of holdings kept in good agricultural condition[31] with adherence to environmental protection requirements, in accordance with the standards, has been increasing[32] (Figure 3.2).

In 2015, agricultural land kept in good condition, in the total area of agricultural land, constituted 99%, when in 2007 that ratio was 95.6%[33]. These changes indicate an increasing tendency for farmers to keep agricultural land in good condition with adherence to environmental protection requirements. This situation is probably connected with the possibilities of procuring, and the amount of support received from the EU for agricultural holding users [Duer 2009, Staniewska 2011]. Failure to comply with the rules specified in the Council Regulation (EC) No. 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy, may, in extreme cases, constitute a basis for exclusion from receiving assistance, or the European Commission demanding the member state return, unduly granted funds [Kalbarczyk 2014].

[31] The notion of good agricultural culture has been introduced in 2004, by way of the Regulation of the Minister of Agriculture and Rural Development of 7 April 2004 (Journal of Laws of 2004 no. 65, item 600).

[32] Regulation of the Minister of Agriculture and Rural Development of 12 March 2007, on minimal standards (Journal of Laws No. 46. item 36 with later amendments).

[33] Data for 2007, 2008 and 2009 include agricultural lands in good culture in agricultural holdings conducting agricultural activities. Adoption of this criterion was dictated by a change of the definition of an agricultural holding in socio-economic research, and allowed a comparison with the data disclosed by GUS since 2010. Such an approach, unless stated otherwise, shall be applied in subsequent parts hereof.

3.3.2. Labour resources

The labour factor represented by human resources, plays a crucial role in the process of farming [Kowalski 1998]. Labour resources in a company may be characterized qualitatively and quantitatively. In quantitative terms they are described as the number of active or potentially active persons in the company, therefore, labour resources express the workforce used and possible to be used in production.

The size of the workforce resource is generally measured by the number of natural persons, or the number of contractual work units[34]. Measuring labour resources by the number of natural persons, does allow to identify the socio--economic structural workforce features, however, it gives rise to a number of problems resulting mainly from the ambiguity of the term „person working in agriculture", as the various definitions are used e.g. during agricultural censuses, preparing public statistics and databases collected by international institutions [Strzelecki 2010].

Furthermore, determining the number of persons working in agriculture, allows to synthetically determine the workforce resource size and mainly labour input. This situation results from a diverse work time of individual persons, and is very strongly highlighted in agriculture, due to the dominant in this segment of economic activity, family organization system and production seasonality, as well as widespread combining of work within and without the agricultural holding [Karwat-Woźniak 2015].

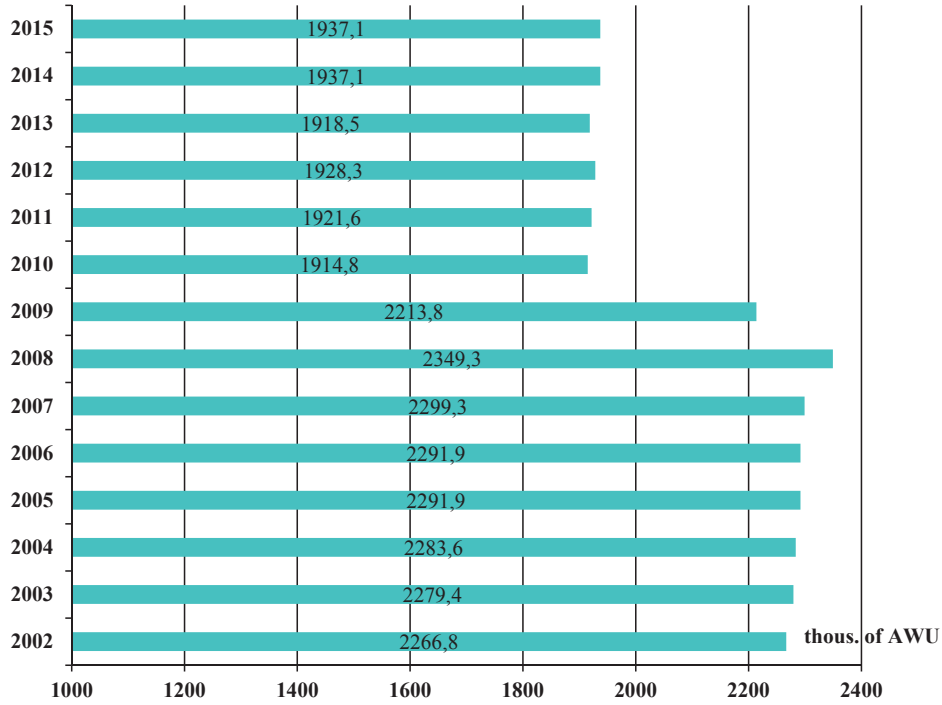
The analysis of labour resources in Polish agriculture indicates that between 2002 and 2015, labour inputs have been reduced from 2,266.8 to 1,937.1 thousand (by 329.7, i.e. 14.5%), expressed in annual work units (Figure 3.3). A noticeable reduction in labour input sizes has been recorded as late as 2010, when the value was 13.5% lower than the year before. Unfortunately, these tendencies were not visible in the following years, and in subsequent years, stagnation was observed with regard to the size of labour potential employed by agricultural activities (Figure 3.3). Consequently, Polish agriculture is still characterized by one of the greatest employment of labour resources.

In 2014, Polish agriculture involved 19.8% of total agricultural labour input in EU-28. This was definitely higher than the labour input share in the agricultural sector of states, where the acreage of land used for farming was similar

[34] Labour resources in agriculture are expressed in annual work units (AWU). In Poland, it has been assumed that the annual work unit is equal to full-time employment, which corresponds to 2,120 hours worked in a year, i.e. 265 days, 8 hours of work each. In addition, the condition is retained that a single person may provide at most 1 AWU, even when actually they work more than 8 hours each day.

to the area of agricultural lands in Poland. In 2014, labour input in agriculture in Germany constituted 5.2% of total agricultural labour input in the EU-28. In the case of the UK that share was 3.0%.

Figure 3.3. Total labour input in Polish agricultural holdings



Source: prepared on the basis of data from the Economic Accounts for Agriculture for relevant years.

3.3.3. Capital

Capital is the third, next to land and labour, main factor of production in agriculture. It consists of all material components, except land, of the production potential and is the basic part of production assets [Woś 1996].

Capital is not a homogeneous factor and may be discussed from the perspective of wear and tear during the production cycle. From this perspective, material production factors may be divided into:

- ⇨ current assets[35] that are completely consumed in a single production cycle, transferring their entire value on the product;

[35] In the group of current assets the liquid assets may be distinguished, which include i.a. cash and receivables.

⇨ fixed assets – tangible factors participating in many production processes, during which they do not change their material form, and by gradual wear and tear transfer only adequate part of their value to the product.

3.3.3.1. Fixed assets and investment expenditures[36]

Among resources defining production potential of agricultural holdings, an important place is occupied by fixed assets of agricultural origin (e.g. basic herd, permanent plantations), as well as basic and specialized, technical (non-agricultural), permanent means of production, often defined as agricultural infrastructure [Woźniak, Sikora 2006]. Without fixed assets of a non-agricultural nature, it is practically impossible to conduct the process of producing agricultural raw materials and the proper functioning of a holding. In addition, agricultural infrastructure of agricultural holdings is one of the relatively most important group of production factors affecting the essence of production, which in consequence conditions the nature of agriculture.

Technical fixed assets resources in agriculture determine the degree of technologizing agricultural production, i.e. the scope of replacing human labour with objectified labour in the form of tractors, machines and tools, and relevant buildings and structures etc. Owning modern technical means enables the use of new technologies, due to which it becomes possible to reduce the size and inconvenience of works in agricultural activities, as well as an increase of production scale and quality. Consequently, the efficiency and income from agricultural work increase. Therefore, equipping agricultural holdings with agricultural infrastructure, to an increasingly larger extent, determines economic efficiency thereof, as well as competitiveness on the market of agricultural raw materials production, and, at the same time, is one of the distinguishing markers of economic development of agricultural holdings.

The condition for maintaining the position of Polish agriculture, on an increasingly more demanding market is i.a., the need for matching the competition, not only in the cost-price scope, but also in terms of the resource base. This may only be achieved, especially in the basic branches of agricultural production, by those holdings, which shall be ready to focus their production activities on market needs with regards to production scale and quality, and increasing management effectiveness It is connected, i.a. with reorganizing and modernizing the technical infrastructure [Woźniak, Sikora 2006]. As a result, techniques of producing agricultural articles undergo a continuous evolution. An increase is noted not only in the degree of complexity of agricultural machines and devices used, but also in their efficiency and technological efficiency [Kowalski 1998],

[36] Data for agricultural cultivations, livestock rearing and hunting.

as well as in the impact on the natural environment. The use of new generation of agriculture mechanisation allows a reduction in unit outlays (e.g. energy) and an improvement in labour efficiency, and consequently, a reduction of production costs and improvement in management effectiveness, as well as in respect for the environment [Pawlak 2005].

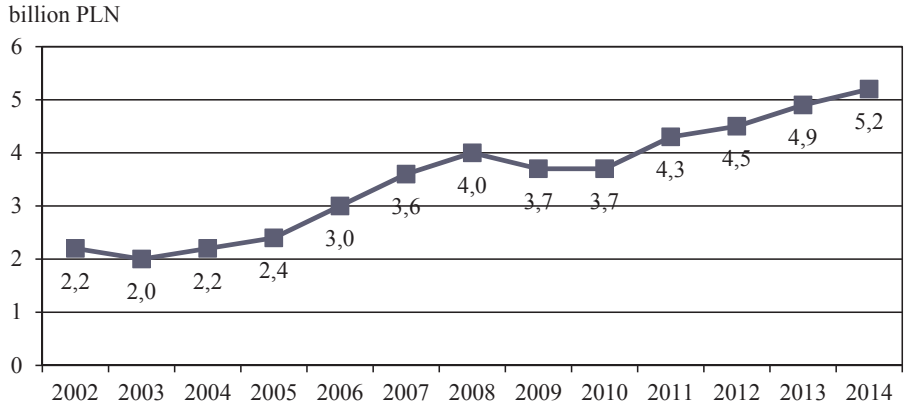
Technical utilities in holdings also condition the effectiveness of use of other production factors, which additionally affects economic management efficiency. Therefore, the development level of agricultural infrastructure in holdings has an increasingly larger influence on determining the economic efficiency thereof, and the market competitiveness of agricultural products. The use of modern technical solutions in agricultural activities is favourable not only in the economic-production aspect, but may also minimize the adverse environmental impact [Pawlak 2008]. Therefore, it constitutes an important element in the process of sustainable development of not only individual agricultural holdings, but also the entire agriculture sector and rural areas.

The basic condition for sustainable development of all branches of the economy [Toruń, Wyrębek 2009], including agriculture, and for matching the competition from other states, are investments, especially in machines, technical devices and tools. In this section of the economy, an extremely important role is played by technical and technological progress.

In the analysed time span, a significant increase in investment expenditures has been noted (Figure 3.4). In 2014, the value of investment expenditures was PLN 5.2 billion, which was twice as much than in years earlier. Such a large increase of investment activity was made possible, mainly due to subsidies from the funds of the CAP. In the analysed years, the value of investment expenditures showed certain changeability. Consequently, in 2003 and 2009 a 7-8% reduction of investments has been recorded in relation to the preceding period. In other years, expenditures for numerous year-to-year investments had increased.

The investment level achieved in 2014 should still be considered insufficient, as it would allow the renewal of production assets in agriculture after 26 years. However, it should be emphasized that it was a significantly shorter period than in previous years.

Figure 3.4. Investment expenditures in Polish agriculture



Source: prepared on the basis of - Statistical Yearbook of Agriculture and Rural Areas (relevant yearbooks) GUS, Warsaw.

In addition, due to the fact that investment activities are conducted in relatively few entities[37], the nearly thirty-year period of renewing fixed means of production should not bar efficiency-oriented structural changes.

Table 3.1. Structure of investment expenditures in Polish agriculture*
(total value of investments = 100)

investments on	2000	2002	2004	2006	2008	2010	2012	2013	2014
buildings	33.7	40.1	39.2	39.3	36.9	34.5	35.5	39.8	42.8
machines, technical devices and tools	32.7	31.7	31.6	32.2	34.3	38.3	38.0	35.3	32.1
means of transport	12.4	11.4	13.0	15.7	16.7	14.6	15.1	13.2	14.1

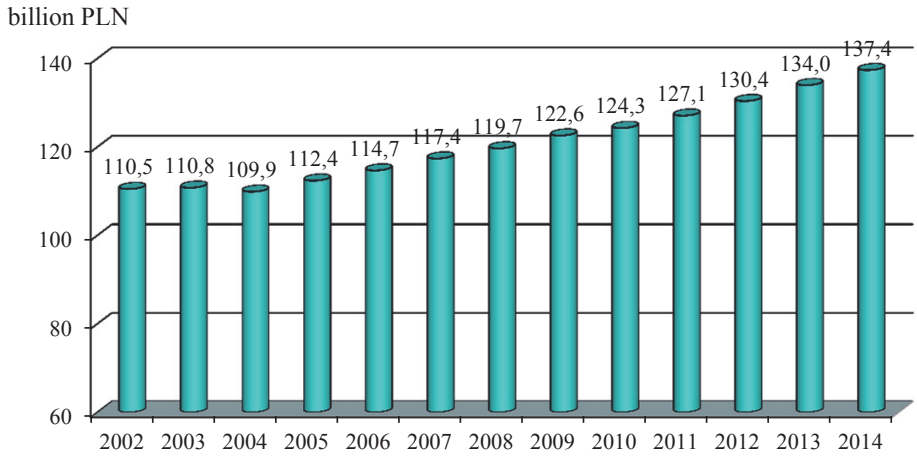
*Data for plant production, animal breeding and hunting.

Source: prepared on the basis of – Statistical Yearbook of Agriculture and Rural Areas (relevant yearbooks) GUS, Warsaw.

Moreover, given the fact that in the case of fixed assets creating the possibility of implementing new technologies in agricultural production, i.e. measures of mechanization, this period is twice as short. The structure-by-type of investment outlays in agriculture in the analysed period was practically constant, and dominated by investments in buildings and structures, as well as machines, technical devices and tools (Table 3.1).

[37] IAFE-NRI surveys data indicates that between 2005 and 2011 nearly half expenses for agricultural investments have been incurred by ca. 10% of holdings covered by the study. Referring test results to the overall number of agricultural holdings it can be estimated that a singular extended investment projects have been conducted at that time by ca. 150-160 thousand entities.

Figure 3.5. Gross fixed assets value in Polish agriculture



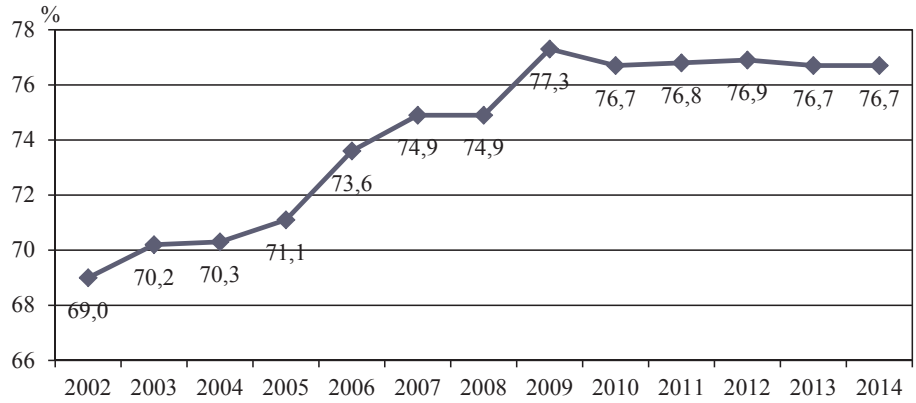
Source: Prepared on the basis of – Statistical Yearbook of Agriculture and Rural Areas (relevant yearbooks) GUS, Warsaw.

The total value of gross fixed assets in agriculture is growing systematically (Chart 3.5). In 2014, the gross value of production assets in agriculture was ca. PLN 137.4 billion, which was almost 1/4 (PLN 26.9 billion) greater than 12 years earlier. Unfortunately, the degree of wear and tear of fixed assets is invariably high (ca. 77%) and stable since 2009 (Figure 3.6).

The relative significant economic, technical and moral use of fixed assets in Polish agriculture is confirmed by the net fixed assets value (Figure 3.7). Furthermore, by 2010 the net value of fixed assets was systematically decreased, and consequently the net amount of production assets was over 15% less than in 2002. After 2010, an inversion occurred of these negative tendencies and growth was recorded in the net fixed assets value. However, considering the fact that investment processes concern a limited number of holdings with relative economic strength which often co-finance their modernization efforts by means of EU funds[38].

[38] IERiGŻ-PIB field-studies data indicates that such processes occur mainly in holdings that produce mostly or solely for own needs of the user and their family members. These constituted about half of the examined set, and most of them had an area not exceeding 5 ha of agricultural land. It can be estimated that processes of decapitalization of production assets encompass ca. 700-750 thousand holdings.

Figure 3.6. The level of use of fixed assets in Polish agriculture*

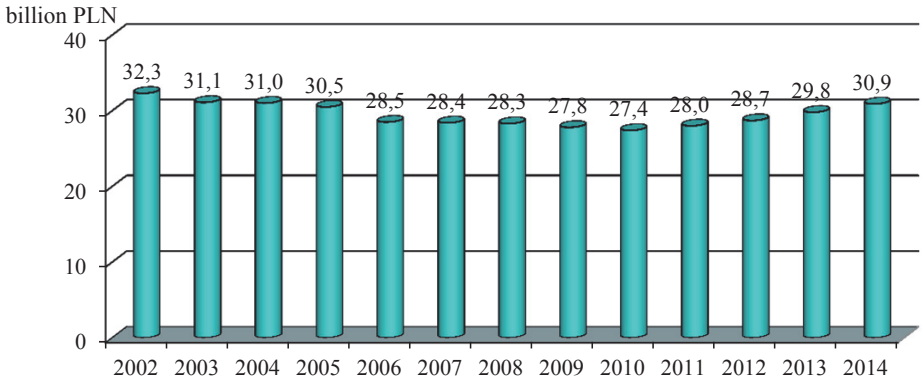


*without livestock

Source: Prepared on the basis of - Statistical Yearbook of Agriculture and Rural Areas (relevant yearbooks) GUS, Warsaw.

The consequence is the relatively fast modernisation of production assets in these holdings. In most of the holdings, undertaken investments do not ensure the renewal of possessed fixed assets which in turn undergo decapitalization, and a decrease of the production assets net value.

Figure 3.7. Net fixed assets value in Polish agriculture*



*without the value of livestock

Source: Prepared on the basis of – Statistical Yearbook of Agriculture and Rural Areas (relevant yearbooks) GUS, Warsaw.

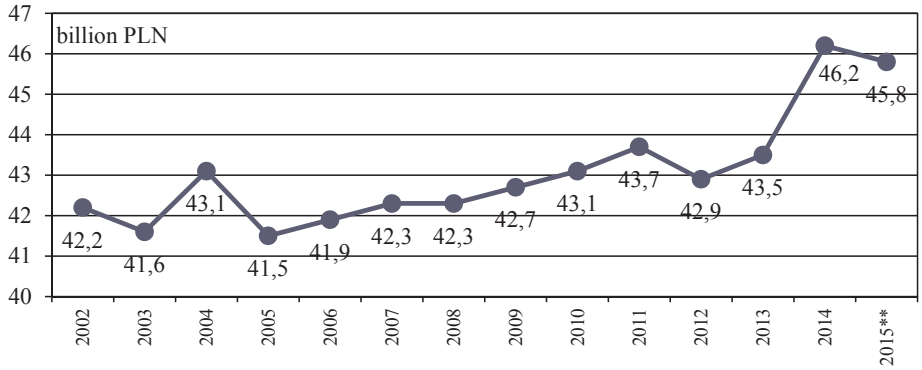
The decapitalization process described above, regarding production assets in small holdings is inevitable, however, it is paramount that occur in connection with transformations in the agricultural holdings number and structure, and, if possible, use the part of production assets unused in agricultural activities [Poczta 2012].

3.3.3.2. Capital expenditures

Capital expenditures include funds disbursed in the production process, intended for the purchase of necessary means and work items (infrastructure, raw materials, materials, tools, power etc.). Therefore, capital expenditures express the accordingly evaluated, purposeful consumption of current assets (indirect) and fixed assets (depreciation).

On the other hand, in the discussed period an increase occurred, of capital expenditures (indirect consumption and depreciation), the value of which, expressed in fixed prices, has increased by ca. 13.5%. Still, it should be recognized that capital expenditures in the Polish agriculture are relatively low, as in 2014, they constituted 5.2% of the total costs of consumption and depreciation in the EU-28. Besides, in Poland it was a level over 3 times lower than in German agriculture, which conducts operations on the area similar to the Polish one and the assortment structure of agricultural production is comparable with production in Poland. When interpreting the changes taking place in subsequent years in the value of capital expenditures, it should be considered that in the analysed time span, a fluctuations occurred after years of decrease (2003, 2005 and 2012), stagnation was recorded or an increase in the value of intermediate expenditures (Figure 3.8). The greatest, rapid increase was recorded in 2004 (by 3.6% as compared to 2003) and 2014 (by 6.2% as compared to 2013).

Figure 3.8. Capital expenditures in Polish agriculture



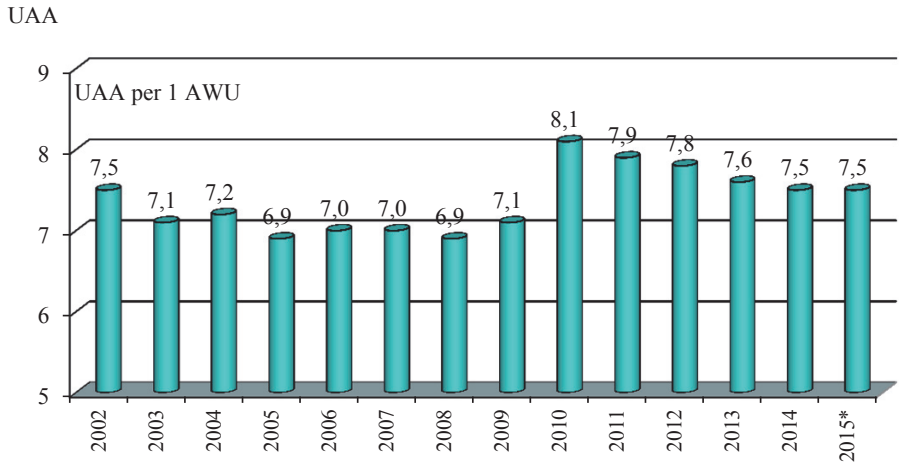
*indirect consumption and depreciation, fixed prices with 2005.
**preliminary data

Source: prepared on the basis of data from Economic Accounts for Agriculture for relevant years.

3.4. Relations between resources of production factors

In 2002-2015, in the sectoral perspective, relatively small changes were recorded regarding owned (used) production factors resources and outlays thereof. This relatively minuscule change dynamics in the amount of basic resources of agricultural production factors was also reflected in relatively minute changes in relations between production factors (expenditures) in agriculture (Figure 3.9, 3.10, 3.11).

Figure 3.9. UAA per 1 AWU in Poland



*preliminary data

Source: prepared on the basis of data from Economic Accounts for Agriculture for relevant years.

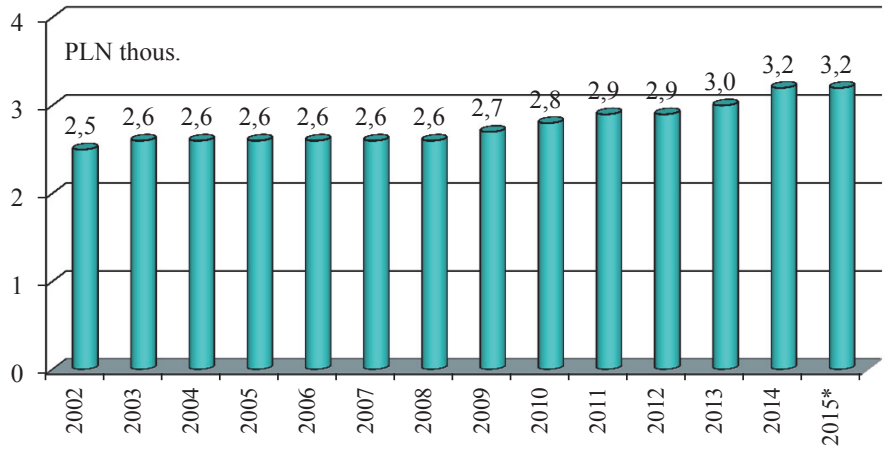
The comparison of productions factor values in 2002, and the final year of analysis, indicates that relations between:

- ⇨ land resources (agricultural land area constituting agricultural holdings), and labour expenditures (AWU) have not changed; UAA per 1 AWU both in 2002 and 2015 was 7.5 ha. This situation has been affected on the one hand, by a decrease of the acreage of agricultural land used for farming and a decrease of persons working in agriculture, resulting in a decrease of labour expenditures, the size of which has, in the long-term perspective, been proportional on the UAA decrease;
- ⇨ capital expenditures and UAA surface have been improved, the value of indirect consumption and depreciation per 1 ha of UAA has increased from PLN 2.5 thousand to PLN 3.3 thousand, i.e. by ca. 32%. A noticeable change of these relations was mainly conditioned by an increase of in-

direct consumption and depreciation, which was accompanied by a relatively smaller conversion of agricultural land;

- ⇨ capital expenditures and labour input, have also changed favourably, and the size of this improvement was similar to the changes in the capital-land relation; value of indirect consumption and depreciation per 1 AWU has increased from PLN 18.6 thousand to PLN 24.7 thousand, i.e. by ca. 34%. A noticeable improvement of those proportions was conditioned by multiplying indirect consumption and depreciation, which was accompanied by a relatively smaller decrease in labour expenditure.

Figure 3.10. Capital expenditures per 1 ha UAA in Polish agriculture (fixed prices 2005=100)



*preliminary data

Source: prepared on the basis of data from Economic Accounts for Agriculture for relevant years.

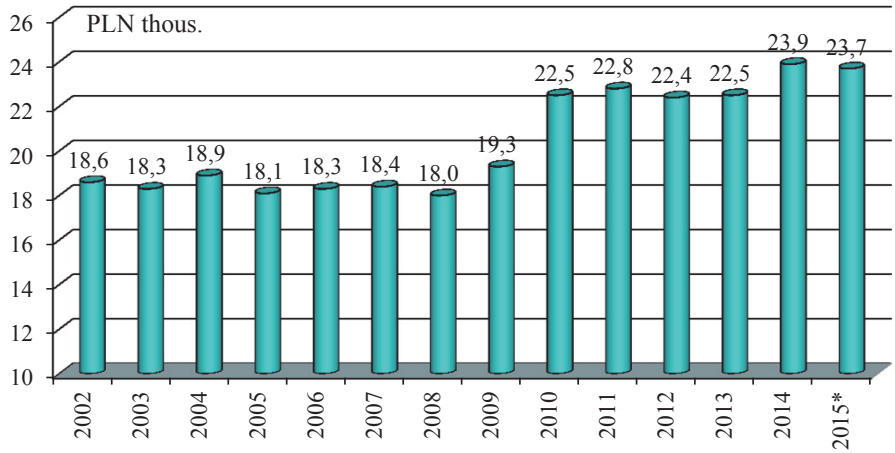
The analysis of the changes in the size of resources of production means and the proportion between them in individual years, indicates that their intensification was diverse in individual periods, and often different from the above presented general long-term trends. In the case of:

- ⇨ capital-labour expenditures proportion, in 2002-2004, deterioration of the relation, value per 1 AWU decreased from PLN 18.6 thousand to PLN 18.3 thousand. In the following years, despite the fluctuations, a positive change occurred of this relation (increase from PLN 18.9 thousand to PLN 19.3 thousand per 1 AWU). A noticeable change was visible only

since 2010, in consequence of labour expenditure reduction[39] and a moderate increase in capital expenditures levels. An improvement in the capital-labour relation was especially visible in the last analyzed years. This was a consequence of the growth (by ca. 10%) of capital expenditures between 2013 and 2015, accompanied by a minimal increase (nearly 1%) of labour expenditures;

- ⇨ capital-land relation, 2002-2008 were characterised by stagnation, as the capital expenditures value per one area unit has increased only by 4%, and that change occurred between 2002 and 2003. A positive change of these relations became gradually noticeable since 2009, and in 2015 the value of capital per 1 ha of UAA was PLN 3.3 thousand, therefore it was almost 27% higher than in 2008;
- ⇨ agricultural land resources-labour expenditures relation, positive change in the relation of the active factor, i.e. labour and land resources of the land factor becomes evident in 2010, mainly due to the relatively great decrease in labour expenditures in agriculture, specified by Eurostat.

Figure 3.11. Capital expenditures value per 1 AWU in Polish agriculture



*preliminary data

Source: prepared on the basis of data from Economic Accounts for Agriculture for relevant years.

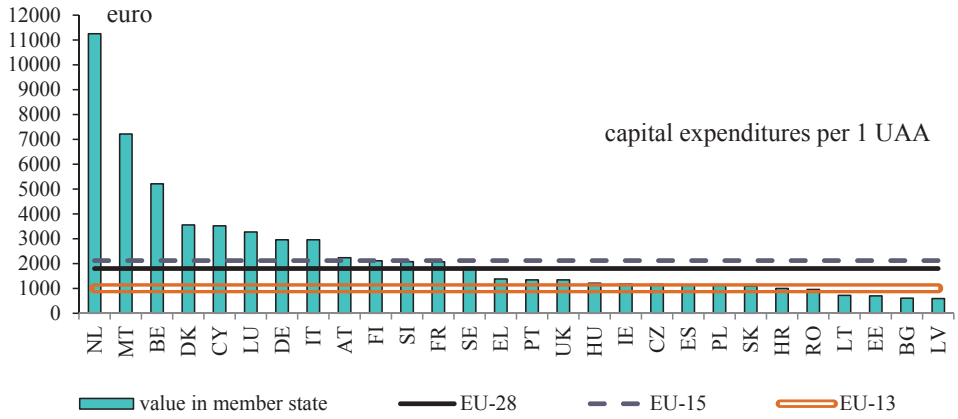
From the point of view of the evaluation of the occurring changes in the relations between production factors in Polish agriculture, it is important to analyse them from the perspective of similar proportions in countries, which partic-

[39] Mainly as a result of a drop in labour input in Polish agriculture according to Eurostat.

ipate in the Common Agricultural Market, especially with agriculture in states with similar natural-climatic conditions and in consequence with a similar structure of agricultural production, therefore those in central and western, and, in particular, with German agriculture [Baer-Nawrocka, Poczta 2016].

The conducted comparative analysis for 2014 indicates that relations between factors in 2014 in Polish agriculture significantly differed from respective indicators not only in most EU-28 countries, and especially the EU-15. The comparison of all the fundamental agricultural production factors and their mutual proportion indicates that the worst situation is present in the capital-labour relation. With capital expenditures per one work unit in Polish agriculture at the level of EUR 8.4 thousand, Polish agriculture was classified amongst the last of the EU (Figure 3.12).

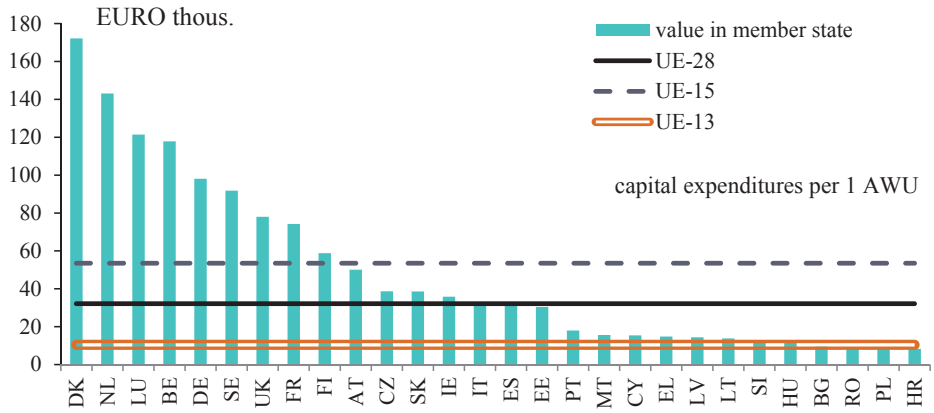
Figure 3.12. Labour-capital input relations in 2014 in the EU agriculture



Source: prepared based on Eurostat data 2016.

Capital expenditures value per one work unit in Polish agriculture was not only over six times lower than the EU-15 average (EUR 53.5 thousand) and nearly four times lower than the EU-28 average (EUR 32.1 thousand), but also almost 1/5 lower than the average for agriculture in countries (EUR 10.4 thousand), which, like Poland, joined the EU later. At the same time, it should be emphasized that lower capital expenditures per 1 AWU were observed only in Croatian agriculture, but this difference was minimal (slightly above 1%). In relation to German agriculture, on this plane, we are separated by an enormous „gap", as capital expenditures per 1 AWU in Germany were nearly 12 times higher than in Poland, i.e. EUR 98.1 thousand.

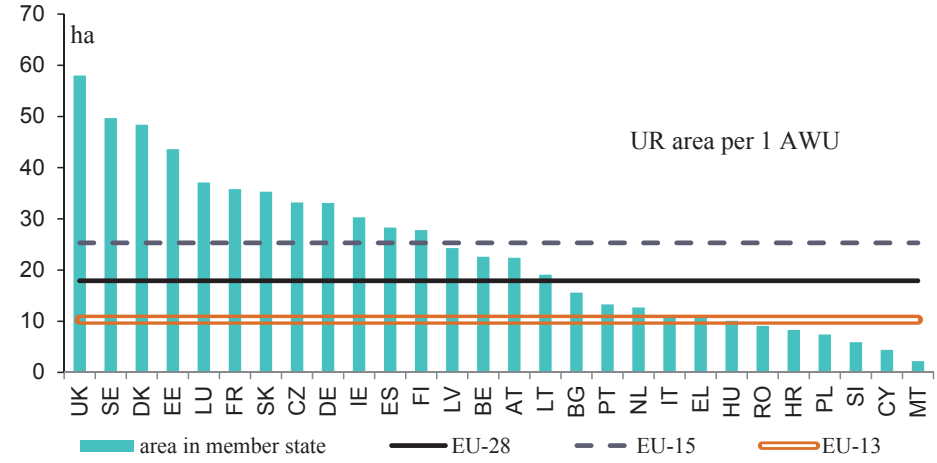
Figure 3.13. Land-capital relation in 2014 in the EU agriculture



Source: prepared based on Eurostat data 2016.

The situation of Polish agriculture is slightly better with regards to capital expenditures per one unit of agricultural land used for farming (Figure 3.13). In 2014, production intensity measured with this indicator was EUR 1,126, which was almost 60% less than the EU-28 average (EUR 1,798), and 88% in minus from the average level for the EU-15 (EUR 2,118).

Figure 3.14. Land-labour relation in 2014 in the EU agriculture



Source: prepared based on Eurostat data 2016.

At the same time, the value of capital expenditures in 2014 per 1 ha of UAA in Polish agriculture was 12% higher than the average level in the EU-13, which at that time was slightly above EUR 1,000. In addition, lower production

intensity was recorded in agriculture of the seven EU states, which, together with Poland, were late entries to the EU[40]. On the other hand, the value of capital expenditures per UAA unit in German agriculture was EUR 2,959, which means it was ca. 163% higher than the respective indicator in Polish agriculture.

What is more, the comparison of land possession of persons working in Polish agriculture in relation to the majority of EU states is unfavourable as well (Figure 3.14). UAA per 1 AWU in 2014 in Poland was 7.5 ha of UAA per 1 AWU, is more than two times lower than the EU-28 average (17.9 ha of UAA); and as compared to the EU-15 average (25.3 ha) – almost 3.5 times less. On the other hand, the UAA per 1 AWU in German agriculture was 33.1 ha, which means that it was about 340% higher than an respective ratio in Polish agriculture. At the same time, land resources at the disposal of persons working in Polish agriculture per labour unit were also lower (by ca. 28%) than the EU-13 average (10.3 ha). Furthermore, smaller land resources than in Polish agriculture, are at the disposal of persons fully employed in agriculture in only three EU states, i.e. Malta, Cyprus and Slovenia, the countries with more favourable climate.

The presented comparative analysis shows that still in a sectoral perspective Polish agriculture is characterized by a relatively low equipment of an active production factor, i.e. labour with land and capital. The gap level between agricultures in Poland and the majority of the EU memeber states indicates relatively weak position of the Polish agriculture, especially in terms of resources and determined the overall low labour efficiency. Simultaneously, as a rule, the relatively low land productivity is defined by a relatively low value of capital expenditures per 1 ha of UAA [Baer-Nawrocka, Poczta 2016].

3.5. Resources of production factors and their mutual relations in individual agricultural holdings according to the market activity

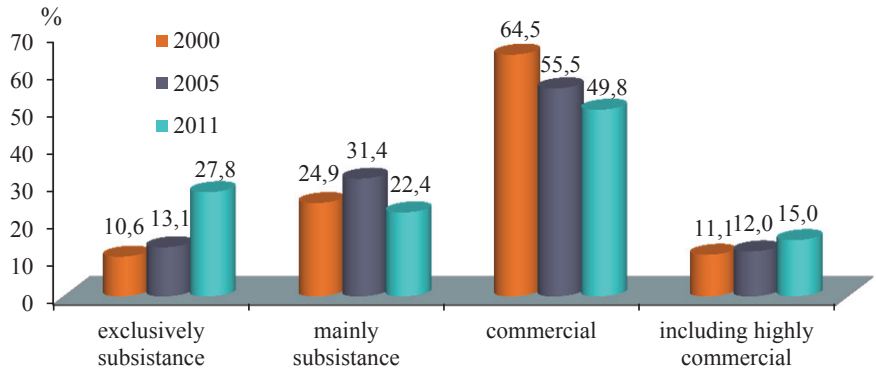
Production factors resources and their mutual relations may be also considered from the perspective of individual agricultural holdings or a group thereof. A characteristic feature of Polish agricultural holdings is their considerable diversity, also from the market activity perspective. Simultaneously, changes occur on this matter, the pace and nature of which are determined mainly by exogenous factors. Although permanent entities are present, characterized by

[40] The level of capital expenditures per one unit of area when compared to an respective ratio in the Polish agriculture was lower in Latvian (by 47%), Bulgarian (by 46%), Estonian (by 38%), Lithuanian (by 36%), Romanian (by 15%), and Slovakian agriculture (by almost 3%).

different production activity, and in consequence, also market activity, i.e. including and mainly subsistence, commercial and highly commercial.

Research results indicate that the noted nearly 11% general decrease between 2000 and 2011, of the number of entities covered by IAFE-NRI survey, which was accompanied by changes in their structure in accordance with market activity (Figure 3.15).

Figure 3.15. Changes in the structure of surveyed individual agricultural holdings according to their market activity (in %)



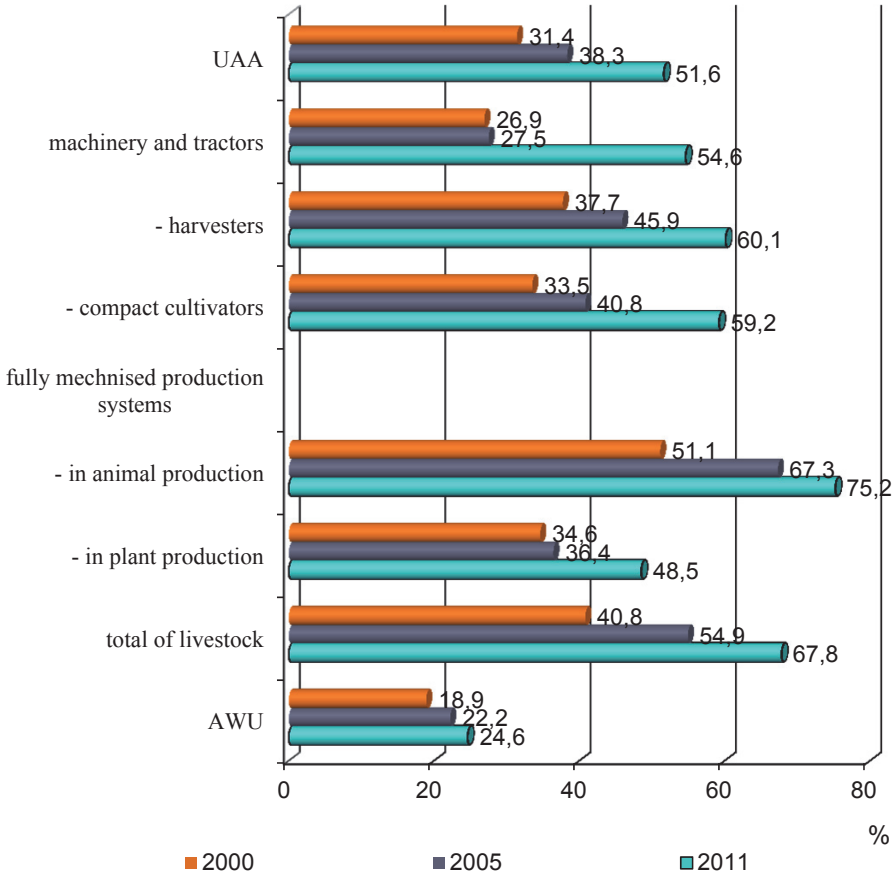
*including holdings without agricultural activitity.
Source: prepared on the basis of IAFE-NRI surveys 2000-2011.

From the macroeconomic perspective, the important issue is not a share of aforementioned groups of holdings, but their numbers and how much resources of production factors they are equipped with. It should be underlined that the proportion between selected groups of holdings with different market activity and production potential determines the condition of the entire agricultural sector and ensures the food security for the whole society.

The data analysis of IAFE-NRI surveys indicates that the effects of diverse business decisions taken by farmers, regarding the operated holding are reflected in the transformations of the size and structure of production assets, but also the scale of agricultural production, especially commercial. These transformations were reflected in the numbers of entities in individual categories (Figure 3.15). These changes were mainly expressed by a reduction of the number of commercial holdings, which was accompanied by the processes of creation of purely pro-market holdings, with very strong and stable connections with the market, and a level of economic and social efficiency comparable to the efficiency of entities of non-agricultural sectors, i.e. highly commercial holdings.

The improvement recorded in the studied time span, and especially after accession the the EU, in the proportion between highly commercial and commercial entities, indicates a growth of competitiveness capacity of Polish agriculture and the capacity to ensure food security. According to the IAFE-NRI data in analysed years, processes of concentrating production assets in commercial and especially highly commercial holdings intensified (Figure 3.16).

Figure 3.16. Selected agricultural production factors resources in highly commerical agricultural holdings (%) at the disposal of highly commercial entities (100 = total surveyed)



Source: prepared on the basis of IAFE-NRI surveys 2000-2011.

In this context, the situation in holdings with exclusively subsistence production was slightly different. In these types of entities divestments were dominating, consisting of adjusting the sizes of owned production assets to production needs for the family. Consequently, the disparity increased in the level of equipment of holdings with production focused on the market, especially highly commercial, and entities producing solely or mainly for own needs.

Table 3.2. Agricultural land in selected groups of surveyed individual agricultural holdings

agricultural holdings	Average area (ha UAA) in		
	2000	2005	2011
- subsistence only	2.7	3.0	2.9
- mainly subsistence	3.2	3.6	3.8
- commercial	11.4	14.0	15.4
including highly commercial	23.2	29.5	34.8

Source: prepared on the basis of IAFE-NRI surveys 2000-2011.

Increasing gap in the quantity of production factors of holdings with varying market activity was common. The pace of these changes varied and was determined by many various reasons. Changes in the level of land possession were particularly strongly influenced by the situation on the agricultural land market, and mainly the increasing imbalance between demand and supply. In the situation of limited and decreasing general land resources and those in possession State Treasury, increasing demand for agricultural lands created by commercial entities, was accompanied by the phenomenon of attachment to one's patrimony. This phenomenon resulted in withholding from selling land by owners of holdings fulfilling mainly extra-income functions. For this part of the population owned holdings secure the basic existence of the family in case of a loss of non-agricultural income sources. Conducting agricultural production intended for family subsistence with basic food became a relatively frequent model of functioning, especially for holdings with a relatively small or medium agricultural land area. Research indicates that the most common reaction was adjusting the holding to a sizes ensuring the satisfaction of own needs, and the surplus was most often rented out.

Consequently, the about 35% (50% for highly commercial holdings) growth in area size of commercial holdings was accompanied by practically no such changes in subsistence holdings. The result of these differences was a growth of differences in land possession between entities with high, medium and small market activity (Table 3.2).

Table 3.3. Technical equipment in selected groups of surveyed individual agricultural holdings

agricultural holdings	share (in %) of entities well equipped in means of mechanisation		
	2000	2005	2011
- subsistence only	0.6	-	-
- mainly subsistence	2.1	1.9	1.1
- commercial	9.1	27.4	35.1
including high-intensity	22.1	59.1	66.9

Source: prepared on the basis of IAFE-NRI surveys 2000-2011.

Research results showed that compared to other groups highly commercial agricultural holdings were in favourable situation. This applied of all the analysed features[41] and the entire time span, but these differences were particularily visible after Poland's accession to the EU. Inflow of EU funds for investments in holdings and the improvement of the economic situation in agriculture, was translated into a growth of income from agricultural activities. This situation sped up production investment activities[42], especially in the group of highly commercial holdings.

Consequently, a relatively dynamic removal of the technical underdevelopment was recorded, which for these entities was a necessity; in order to cope with the increasing competition, and maintain or improve their market position they had to modernize their techniques and technologies of agricultural production. Improvement has been found, in the level of technical labour equipment. For instance, in 2011, 67% of highly commercial holdings have been well equipped in means of mechanisation, when in the group producing mainly for own needs, the same ratio was 1%. In 2005 mentioned percetages amuonted to 59% and 2%, and in 2000, 22% and 2% respectively.

[41] Due to the specificity of IAFE-NRI survey data, the fixed asset resources can be analyzed partially, mainly through the prism of changes in equipment in means of work mechanization on a farm. There was no possibility to determine the value of indirect consumption and depreciation. However, it may be assumed that due to the position of highly commercial holdings in agricultural structures, the positive changes, which occurred with regard to capital expenditures in a sectoral perspective, concerned mainly this category of entities.

[42] In 1996-2000, ca. 75% of holdings defined as highly commercial have invested in production assets, and every entity involved in such projects, has expended PLN 53.2 thousand for this purpose. Between 2005 and 2011, respective indicators were, accordingly, above 87% and PLN 236 thousand. In the group of subsistence holdings, between 2005 and 2011, agricultural investments were carried out by almost 18% of entities, expending for this purpose only EUR 8.9 thousand. For comparison, between 1996 and 2000, respective indicators were accordingly 20% and PLN 5.9 thousand.

Table 3.4. Livestock density in the selected groups of surveyed individual agricultural holdings with animal production

agricultural holdings	livestock density in (LU) per 100 ha UR		
	2000	2005	2011
- subsistence only*	47.9	47.7	46.0
- mainly subsistence	51.1	50.9	43.9
- commercial	67.7	82.6	84.8
including highly commercial	62.9	102.5	105.9

*only holdings with agricultural production

Source: prepared on the basis of IAFE-NRI surveys 2000-2011.

Changes were also documented in livestock numbers, and the nature thereof was affected by intensified contacts with the market (Table 3.4). Exclusively or mainly subsistence holdings were under the processes of withdrawing from animal production and a reduction of the rearing scale. Consequently, stocking intensity has decreased, mainly in the latter of the abovementioned holding categories. In 2011, livestock density per 100 ha of UAA in the set of mainly subsistence holdings was 43.9 LU, and was smaller as compared to 2005 and 2000 by 14%.

A different phenomenon was visible in households producing mainly for the market, especially in the group of highly commercial entities. Although husbandry was conducted by a diminishing number of high-intensity entities, but these tendencies were gradually extinguished[43]. Here, the trend was accompanied by an increase in the rearing scale in high-intensity entities, which did not cease animal production. Consequently, between 2000 and 2011 the stocking number per 100 ha of UAA in highly commercial holdings has increased from 62.9 to 105.9 LU[44] i.e. by 43.0 (by 68%)[45].

[43] Both in 2005 and 2011, the percentage of highly commercial holdings conducting animal production was identical at the level of 75%, whereas between the years 2000 and 2005, the percentage of highly commercial entities with husbandry has on average decreased annually by 0.8 p.p., and between the years 1996 and 2000, the pace of withdrawal from animal production was twice as fast.

[44] It should be added that the increasing concentration in highly commercial holdings with animal production, generally did not cause the exceedance of the environmental condition for sustainable agriculture for the adopted stocking level with a threshold value of 2 LU per 1 ha of UR [Wilk 2005].

[45] These changes occurred mostly between the years 2000 and 2005 and were the result of concentration increase in dairy cattle breeding. The intensification of concentration processes over this period, should be linked with increasing requirements imposed by recipients of raw materials of animal origin and the expansion of the production base by producers expecting a growth of competition at the time of EU accession. Due to a relatively extended period of building (e.g. a herd of cattle) and obtaining production effects, the actions should be taken in advance.

Table 3.5. Labour input in the surveyed individual agricultural holdings according to their market activity

agricultural holdings	annual work units (AWU) per one entity in			change ratio (100 = 2000)
	2000	2005	2011	
- subsistence only*	0.65	0.61	0.59	90.7
- mainly subsistence	0.88	0.87	0.75	82.2
- commercial	1.72	1.54	1.51	87.7
including highly commercial	2.05	2.00	1.57	76.5

*only holdings with agricultural production

Source: prepared on the basis of IAFE-NRI surveys 2000-2011.

The transformations in applied techniques and technologies, and the production structure, as well as diversification processes of professional activities, the rationalization employment relations, resulted in a drop of labour input. Between 2000 and 2011 in the surveyed individual holdings, their size has decreased by ca. 1/5. These changes have, with varying intensity, were noted in the individual groups of holdings resulted in diverse changes in labour resources and input at the disposal of individual categories of the examined holdings (Table 3.5).

Throughout the analysed time span, a positive relation between input and market activity was maintained. However, the processes of employment rationalization have been relatively faster in holdings with a greater market activity. They were mainly caused by a growth in the distance in the capital-to-labour ratio and production specialization between holdings performing mainly functions of subsistence, and those focused on the market, especially high-intensity holdings. Consequently, differences have decreased regarding resources (expenses) in labour between comparable holdings with varying market activity.

Table 3.6. The area of agricultural land per work unit in the selected categories of surveyed individual agricultural holdings

agricultural holdings	area of UAA (in ha) per 1AWU			change ratio (100 = 2000)
	2000	2005	2011	
- subsistence only*	4.1	4.9	4.9	119.5
- mainly subsistence	3.7	4.1	5.0	135.1
- commercial	6.6	9.1	10.2	154.5
including high-intensity	13.8	17.2	22.2	160.9

*only holdings with agricultural production

Source: prepared on the basis of IAFE-NRI surveys 2000-2011.

As a result of the abovementioned changes in resources of the land and labour factors, various transformations occurred in relations showing equipping of the active factor in the agricultural production process, namely, labour with land. The analysis of the changes in the level of land equipment of the labour factor demonstrates the fact that every holding category conducting agricultural production, covered by the survey study, has displayed improvement in labour--land relation (Table 3.6). Additionally, these tendencies have been particularly visible in the group of holdings producing mostly for the market, and especially in the group of high-intensity entities. These tendencies, along with the abovementioned changes in capital asset possession, indicate an improving resource competitiveness of high-intensity holdings.

The abovementioned changes in resources proportions and production factor expenditures in holdings with varying market activity, were reflected in changes of their productivity in individual holding categories. Due to the specificity of survey data, only a partial analysis is possible, of the differences in this aspect, via referring the value of agricultural commercial production to the agricultural land resources, and labour input[46]. The comparison of the commercial production level of the selected holding groups, shows that differences in the productivity level of land resources and labour in holdings with varying market activity, but also with increasing disproportions were noted. The differences in the productivity of land and labour resources were increasing along with the reinforcement of disparity between production factors.

Table 3.7. Relations between land and labour productivity in selected groups of surveyed individual agricultural holdings

relations between land and labour productivity in highly commercial holdings and other entities:	value of commercial production in higly commercial holdings per					
	1 ha of UR = 100			1 AWU = 100		
	2000	2005	2011	2000	2005	2011
- mainly subsistence	19.0	15.8	14.0	5.2	4.5	3.2
- other producing mainly for the market (remaining commercial)	49.9	45.0	39.2	21.0	16.8	13.5

Source: prepared on the basis of IAFE-NRI surveys 2000-2011.

In 2000, the average sales value per 1 ha of UAA on holdings producing for the market, but not defined as highly commercial entities, constituted nearly 50% of the sales volume from an area unit in the highly commercial segment (Table 3.7). Eleven years later, the respective difference was 39%. In the case of

[46] The adopted measures determining land and work productivity do not always fully reflect its level. However, they allow to depict the tendencies and assess the scale of the phenomena.

holdings directing only small parts of agricultural production to the market (subsistence), this difference was greater still, as the average sales value from one hectare of agricultural land in this category amounted to 14% in 2011 (19% – in 2000) of the average value achieved by highly commercial holdings.

Even greater disproportions between highly commercial holdings and entities with less market activity (remaining commercial, mainly subsistence, were revealed in the scope of the productivity of labour input. In 2000, the average value of commercial production per 1 AWU in the last mentioned holding category was only slightly more than 5% of the average value of an similar ratio obtained by highly commercial entities. In 2011, these disproportions had increased, and the value of sales of agricultural products in subsistence holdings per 1 AWU has only been slightly over 3%. In 2000 and 2011, the comparable ratio for holdings producing mostly for the markets, but not defined as highly commercial, was 21% and nearly 14% respectively.

Summary and conclusions

Improvement in the economic structures of agriculture, the growing number of non-farming families as well as demographic changes taking place in rural areas in Poland in the second decade of the XXI century result in a number of transformations in the social environment of the countryside. The structural image of these areas has been revalued. In the countryside, there is less and less agriculture and a significant number of rural population is not associated with agriculture. This group includes retired farmers and other professionals as well as pensioners. This is also a consequence of migration, dynamic rural development, restructured agriculture, location near urban areas. The fact that rural environment becomes similar to the urban environment is noticable; the clearly visible process of ageing of the society, significant increase in the level of education of the population, improvement in equipment of dwellings, including the Internet which became an important tool for work.

In rural areas, the insufficient numer of non-agricultural jobs is observed. The respondents indicated the problems with the level of income and with a decrease in income, but also the problems with selling of agricultural products and contracting. We should stress the fact that the persons (including women) associated with agriculture are more satisfied with the changing reality, than those from the non-farming families.

In rural areas, there has been a significant improvement with respect to the equipment with sanitary and technical installations. However, still 11.6% of the rural families report deficiencies and difficulties in this regard. Moreover, equpiment of the rural households with computers and the Internet has improved, which not only enables the functioning in the modern society, but also gives opportunities of working or shopping. In this respect, of importance seem to be educational activities addressed particularly to the persons in the older age groups, which will lead to reducing the level of digital exclusion and marginalisation of the society in rural areas. There has been the further improvement in the level of equipment of farmers' households with durable goods and thus the alignment of the parity of furnishing. However, of neccessity seem to be the activities aimed at aligning the situation with regard to furnishing with durable goods also within rural areas themselves, as the situation of the non-farming families is relatively worse than that of the families using agricultural holdings. The level of equipment of the households with both technical and sanitary installations and with selected durable goods may also be perceived in the context of the progress of civilisation (especially in case of computerisation, Internet access, which translate into preventing digital exclusion of the residents).

The social activity of the rural residents has increased. The relatively low share among the socially active persons was that of young people and of the women with higher education, which is a consequence of demographic changes (ageing of the society, migration of young people). Social activists are more willing to act in larger groups than they did in the past. The percentage of the villages where men and women were socially active together has increased.

Attention should be paid to relatively high participation of the rural residents in meetings, work in organisations, performing functions in these organisations and involvement in the political matters. Also, in case of the parliamentary, presidential and self-government election, the active attitude of the rural population should be stressed. The persons from the farming families are more involved and active in the life of rural community than the persons from the non-farming families. What is more, the diversification and specific isolation of the non-farming population, which is less involved in the matters of the immediate environment are observed.

One of the basic indicators illustrating the social activity is the dissemination of its institutionalised form i.e. various types of social organisations. The most popular of them are VFD and women's organisations. These groups not only survived the transformations of rural areas associated with Poland's accession to the EU and the previous political changes but they also did not lose their dominant position. As a result, the organisations active in rural areas have been perceived and evaluated primarily on the basis of the benefits of their projects for the entire community. There was a regional diversification of the villages, in which the members of the analysed social organisations were present. Such persons were more often present in the areas of Western Poland (Central-Western and South-Western macro-regions), than in the areas of Eastern Poland. Relatively low participation in such organisations shows that the population is more willing to organise into groups, which are underpinned by a clearly defined objective to implement to a specific good to achieve. Such activities more often involve the society than formalised organisations. Therefore, the rural population feels more related to the local environment, it perceives the closer things in a better manner. This also translates into the fact the rural residents participate in the largest numbers in meetings regarding the issues of the countryside or in election meetings.

Discussions on the possibilities and mechanisms of development of rural areas in Poland have been in progress for many years. They are often focused on economic disparities between rural and urban areas as well as on spatial differences in the condition of technical and social infrastructure. Diminishing the significatn gap in the territorial development is a task of regional policy. In re-

cent years a great variability has been observed in Poland in terms of both the goals, as well as the methods of achieving socio-economic cohesion in the country. A new approach to the development of regions in the EU member states is the idea of smart specialisation. Smart specialisation is the concept and practice of implementing the regional policy and innovation support policy. According to the EU documents, the term smart refers to the economic growth based on innovation and knowledge. In turn, specialisation concerns the integration and concentration of public support on selected areas and industries. This idea refers to various theories of the economic and regional development and innovation developed within the social sciences and is also a specific compilation of them. Nowadays, smart specialisation is one of the key element of the so-called regional innovation strategies of the third generation (RIS 3). It has a major importance for the allocation of EU funds planned under EU cohesion policy in 2014-2020.

A weak point of the previous regional policy instruments introduced in Poland was mainly the short term of their applicability and the limited real impact of adopted strategies. Strategic planning, created institutional systems or instruments were often used for meeting formal conditions in applying for EU support. The analyses showed that a lot of smart specialisations of the voivodeships did not match national specialisations. However, it should be noted that the consistency with national specialisations should not be an overriding issue determining the assessment if the voivodeships made a proper selection. In case of the entire country and of the individual regions, the relatively greatest consistency related to the selection of specialisation connected with the agri-food, forest-wood and environmental bioeconomy. Most of the regions (14 of 16) selected specialisations or subspecialisations concerning those fields (in all voivodeships, 81 specialisations were selected). Relatively, the least often selected specialisation area in the regions was the field regarding natural resources and waste management (4 cases). The regional strategies in question indicate that the entrepreneurial process of discovery proceeded in the voivodeships in various ways. Different was the approach to its organisation (methodology, tools), level of interest and involvement of stakeholders (including) self-government authorities. As a result, the results of the selection of specialisations were diversified.

In many regions, in fact, a large number of priorities were determined. At the same time, there are no uniform mechanisms for monitoring and evaluating the implementation of specialisations. They refer, depending on the regions, to planned assessments of achieving the objectives and measures provided for in regional innovation strategies, regional operational programmes or special documents related to smart specialisations.

Regional innovation strategies based on smart specialisations should be adapted to the whole of geographical, economic, social and institutional conditions of the countryside, including to the specific nature of these areas in the individual regions. Most voivodeships have selected, as their area of specialisation, the sectors related to the environment and agri-food economy (bioeconomy, healthy food, tourism) or to industry, which so far have been also an important factor of development [Wyrwa 2014]. The selection of traditional sectors (agriculture) as an area of specialisation may be in the future a barrier to their development due to fostering the economic slowdown in the future. In addition, the concentration of support on a small number of priorities (smart specialisation) may increase a risk of failure [Figiel et al. 2015]. It is, therefore, necessary to search and commercialise solutions at the interface between these sectors with other modern sections and technologies [Grochowska 2016]. Nevertheless, this approach seems natural for the modern innovation support policy, because the effective activation of these processes is costly and time-consuming, and in many cases it consists in experimenting and often does not succeed. Support and evaluation of its effectiveness should be extended over many years. At the current stage, the assessment of the impact of smart specialisations on agriculture and rural regions in Poland is premature. The mere process of identifying smart specialisations at the level of the country and of the individual voivodeships should be assessed positively. It may contribute to greater innovation in rural areas in the future.

According to the public statistics data (GUS and Eurostat), in the first years of the 21st century, relatively small changes have took place in the size of resources used and production factors inputs. In a sectoral perspective between 2002 and 2015, a decrease (by 13.9%) in the area of agricultural lands, and a slightly greater decrease (by 14.5%) in labour input expressed in AWU was noted. On the other hand, capital expenditures have increased (indirect consumption and depreciation), the value of which, expressed in fixed prices, has increased by 13.5%.

Relatively small changes in the size of resources used and production factors inputs, resulted in relatively small changes between production factors (expenditures) in agricultural sector was noted. The comparison of production factors ratio values in 2002 and the final year of analysis, indicates that relations between:

- ⇨ land resources and labour input (AWU) have not changed; UAA area per 1 AWU both in 2002 and 2015 was 7.5 ha. Generally, it can be stated that, within Polish agriculture an unfavourable labour-land ratio still maintains, which is determined by UAA conversion, and a constant, large agrarian overpopulation, and therefore high labour input;

- ⇨ capital expenditures and UAA have been improved, the value of indirect consumption and depreciation per 1 ha of UAA has increased from PLN 2.5 thousand to PLN 3.3 thousand, i.e. by ca. 32%. A noticeable change of these relations was mainly linked with an increase of indirect consumption and depreciation, which was accompanied by a relatively smaller conversion of agricultural land;
- ⇨ capital expenditures and labour input have also changed favourably, and the size of this improvement was similar to the changes in the capital-land relation; value of indirect consumption and depreciation per 1 AWU has increased from PLN 18.6 thousand to PLN 24.7 thousand, i.e. by ca. 34%. The visible improvement in these proportions was linked with a multiplication of the indirect consumption and depreciation value, accompanied by a relatively minute decrease of labour input.

The relation between production factors in Polish agriculture, should be assessed from the perspective of countries participating in the Common Agricultural Market, and especially with similar climatic conditions and agricultural structures, i.e. countries of western and central Europe, particularily with Germany.

The conducted comparative analysis indicates that in 2014 Polish agriculture covered 8.3% of available land, and engaged 19.8% of labour input and 5.2% of capital expenditures available in EU-28 agriculture, but these irregularities contributed to:

- ⇨ UAA per 1 AWU in Polish agriculture, which is 7.5 ha, was only slightly more than 40% of the same in EU-28; as compared to the EU-15 average, it was ca. 29%, and as compared to the EU-13 – nearly 73%. Persons working in German agriculture have at their disposal nearly 4.5 times more land resources than Polish farmers, and farmers with less land, are employed in agriculture of Malta, Cyprus and Slovenia, i.e. states with more favourable climatic conditions;
- ⇨ capital expenditures per one work unit in the Polish agriculture amounted to ca. EUR 8.4 thousand and covered only slightly more than 26% of the EU-28 average; as compared to EU-15, it was nearly 16%; and in case of EU-13 – nearly 81%. Lower capital input per 1 AWU characterize only Croatian agriculture, and with regards to the level of German agriculture, there is still a „serious gap" as capital expenditures per 1 AWU in Polish agriculture covered only nearly 9% of the German agriculture average;
- ⇨ the production intensity in the Polish agriculture, measured as capital expenditures per 1 ha of UAA, amounted to slightly more than 1.1 and for nearly 63% of the EU-28 average, and 53% as compared to the EU-15 average. At the same time, the value of capital expenditures per 1 ha of

UAA in the Polish agriculture, was clearly higher, by ca. 12%, than the EU-13 average, and in the case of seven countries which joined the Community with Poland, production intensity was lower than Polish.

Proportions illustrating of the equipment with labour, i.e. the active factor in the agricultural production process, the land and capital, proved that despite positive changes, the competitive position of Polish agriculture is still relatively unfavourable, with regard to resources and determines the low labour efficiency. The relatively low agricultural production intensity (capital expenditures per 1 ha of UAA) affected the relatively low land productivity.

Analysis of empirical data demonstrates that the abovementioned changes in resources and production factors in the surveyed agricultural holdings covered by IAFE-NRI research were noted. Additionally, with varying intensity, they were visible in holdings with diffrent market activity.

Research results indicated that the change in numbers and structure of individual categories (exclusively or mainly subsistence, commercial and highly commercial) was accompanied by the stronger changes in the size of possessed resources/inputs of agricultural production factors. The agricultural holdings polarization process noted between 2000-2011, into entities not active on the agricultural market, i.e. solely and mainly subsistence holdings and market-oriented units, i.e. commercial farms, was accompanied by a process of separation of agricultural holdings, which, due to achieved production results, were capable to compete effectively, i.e. highly commercial.

The separation of highly commercial farms was accompanied by a relatively stronger trend of concentrating land and production assets in this holding category. Consequently, between 2000 and 2011, this segment has strengthened its position within agribusiness structures. The number of highly commercial holdings has increased by only slightly more than 14%, and the share thereof, from 11% to 15%, and the share of land at the disposal of holdings from this category, has increased from 31% to 52%, that of technical means of production, from 27% to 55%, and that of livestock, from 41% to 68%. These, relatively intense processes of concentrating land resources and production assets in highly commercial holdings, were accompanied by a relatively small increase in labour inputs. The share of labour input in holdings among the total surveyed, has increased from 19% in 2000, to 25% in 2011.

Due to the specificity of IAFE-NRI survey data, the changes in relations of the level of equipment with active factor in the agricultural production process, i.e. labour in the land were possible to capture. The analysis of changes in the level of equipment the labour factor with the land, demonstrates that in each category of holdings with agricultural production, covered by the survey study,

an improvement in the labour-land ratio was noted. Additionally, these tendencies have been particularly visible in the group of holdings producing mostly for the market, and especially in the group of high-intensity entities. Between 2000 and 2011, the UAA per 1 AWU has increased from 13.8 to 22.2 ha, and therefore was about the average level of this ratio in the EU-15. On the other hand, holdings producing solely and mainly for subsistence, the UAA area per 1 AWU in 2011 was accordingly 4.9 and 5.0 ha, and in 2000, 4.1 and 3.7 ha.

Changes in the proportions of resources and production factor inputs in holdings with different market activity were reflected in shifts in their productivity in individual holding categories.

The comparison of the commercial production level of selected agricultural holding groups shows that differences exist in the productivity level of land resources and labour in units with varying market activity, but also with increasing disproportions. The differences in the productivity of land and labour resources were increasing along with the reinforcement of disparity between production factors. In 2000, the average sales value per 1 ha of UAA in holdings producing for the market, but not deemed highly commercial entities, constituted nearly 50% of the sales volume from an area unit in the high-intensity segment. Eleven years later, this difference was 39%. In the case of farms selling only small parts of agricultural production (subsistence), this difference was greater still, as the average sales value from one hectare of agricultural land in this category of entities was 14% in 2011 (19% in 2000) of the average value achieved by highly commercial holdings.

Even greater disproportions between highly commercial holdings and entities with less market activity (remaining commercial), mainly subsistence, were revealed in the scope of the productivity of labour input. In 2000, the average value of commercial production per 1 AWU in the last mentioned holding category was only slightly more than 5% of the average value of an respective ratio obtained by highly commercial entities. In 2011, these disproportions had increased, and the value of sales of agricultural products in subsistence holdings per 1 AWU has only been slightly over 3%. In 2000 and 2011, the comparable ratio for holdings producing mostly for the markets, but not defined highly commercial, was accordingly 21% and nearly 14%.

The conducted analyses demonstrate that further development of Polish agriculture is connected mainly with processes of production factor concentration, especially of land.

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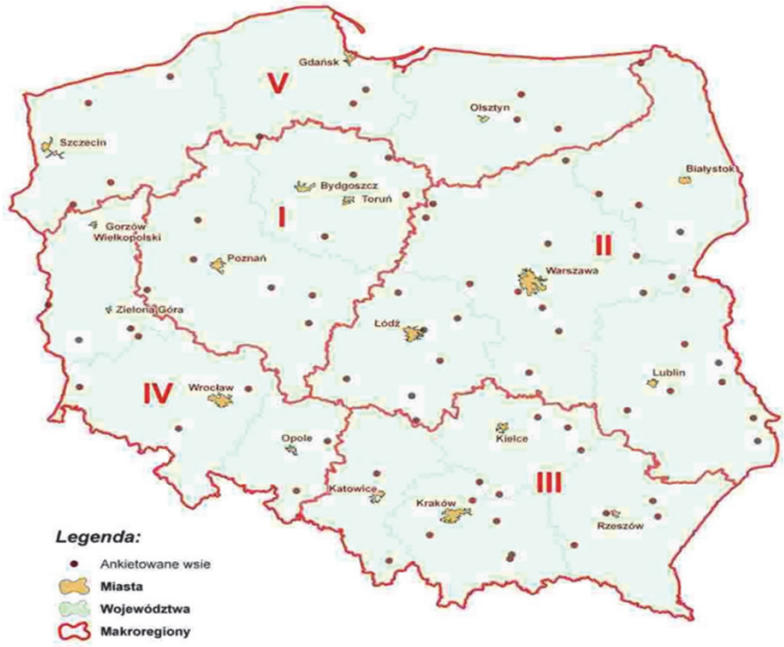
Annex

Map A.1. Location of the villages covered by the IAFE-NRI survey by regions

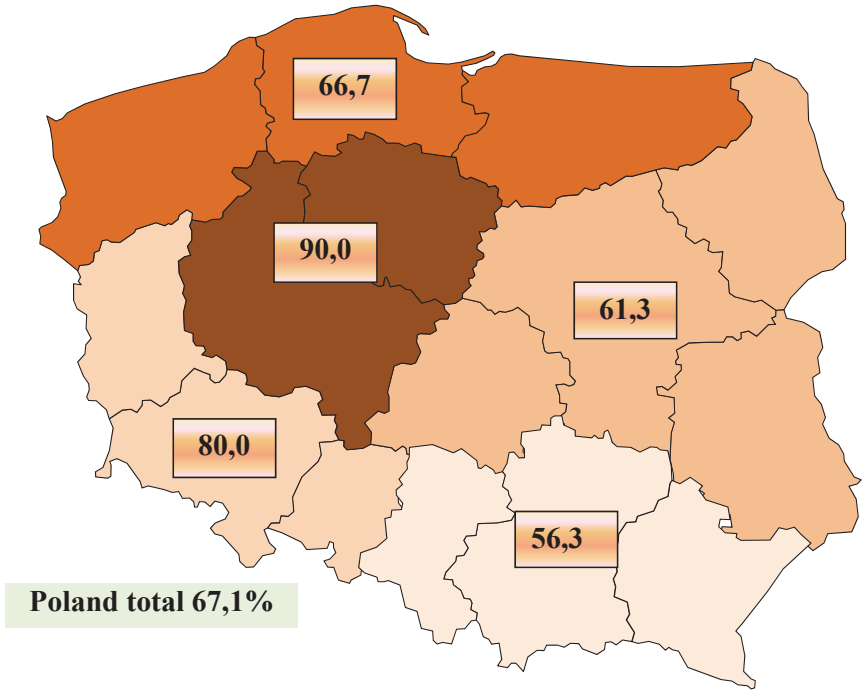


Macroregions:

- ⇨ Central-Western (voivodeships: Kujawsko-Pomorskie and Wielkopolskie);
- ⇨ Central-Eastern (voivodeships: Mazowieckie, Lubelskie, Łódzkie and Podlaskie);
- ⇨ South-Eastern (voivodeships: Małopolskie, Podkarpackie, Śląskie and Świętokrzyskie);
- ⇨ South-Western (voivodeships: Dolnośląskie, Lubuskie and Opolskie);
- ⇨ Northern (voivodeships: Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie).

Source: based on the IAFE-NRI survey 2011.

Map A.2. Percentage of the villages with the Volunteer Fire Department members, by selected macroregions

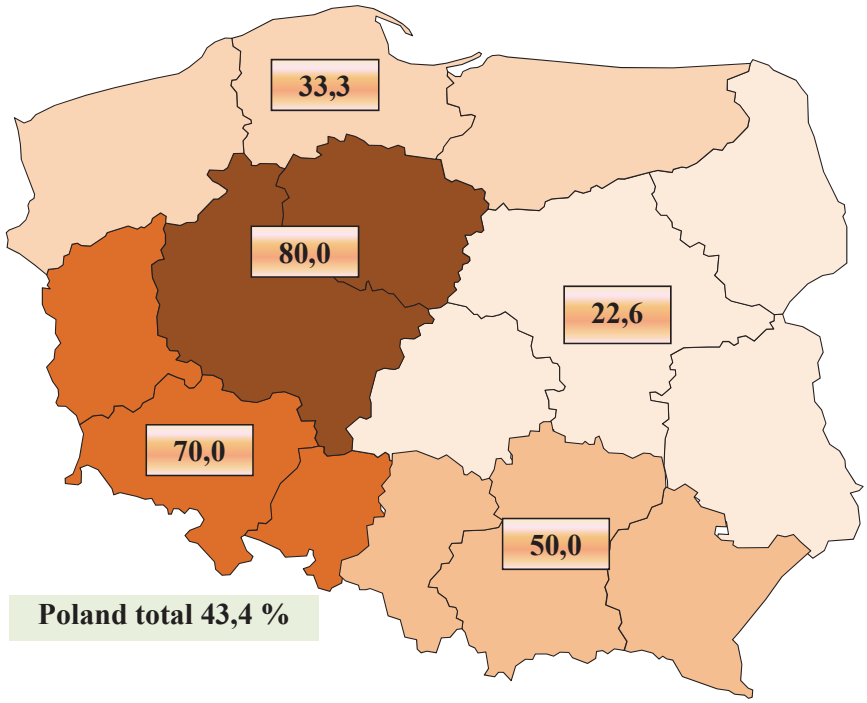


Macroregions:

- ⇨ Central-Western (voivodeships: Kujawsko-Pomorskie and Wielkopolskie);
- ⇨ Central-Eastern (voivodeships: Mazowieckie, Lubelskie, Łódzkie and Podlaskie);
- ⇨ South-Eastern (voivodeships: Małopolskie, Podkarpackie, Śląskie and Świętokrzyskie);
- ⇨ South-Western (voivodeships: Dolnośląskie, Lubuskie and Opolskie);
- ⇨ Northern (voivodeships: Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie).

Source: based on the IAFE-NRI survey 2011.

Map A.3. Percentage of the villages with the women's organisation members (including FWA), by selected macroregions

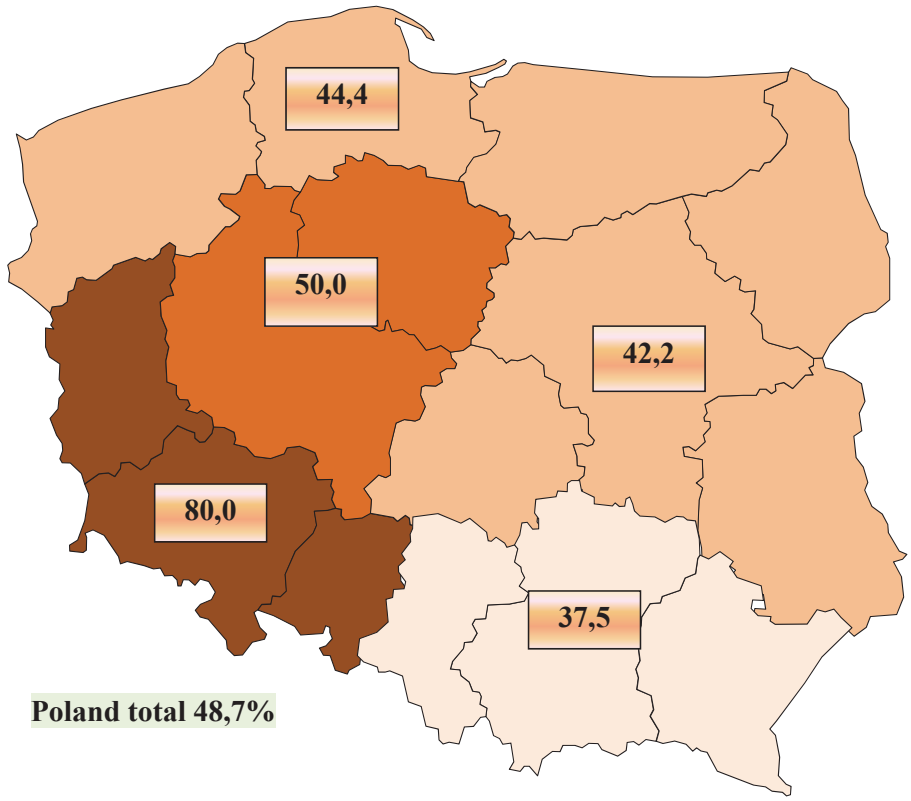


Macroregions:

- ⇨ Central-Western (voivodeships: Kujawsko-Pomorskie and Wielkopolskie);
- ⇨ Central-Eastern (voivodeships: Mazowieckie, Lubelskie, Łódzkie and Podlaskie);
- ⇨ South-Eastern (voivodeships: Małopolskie, Podkarpackie, Śląskie and Świętokrzyskie);
- ⇨ South-Western (voivodeships: Dolnośląskie, Lubuskie and Opolskie);
- ⇨ Northern (voivodeships: Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie).

Source: based on the IAFE-NRI survey 2011.

Map A.4. Percentage of the villages with the members of parish associations/ religious circles, by selected macroregions

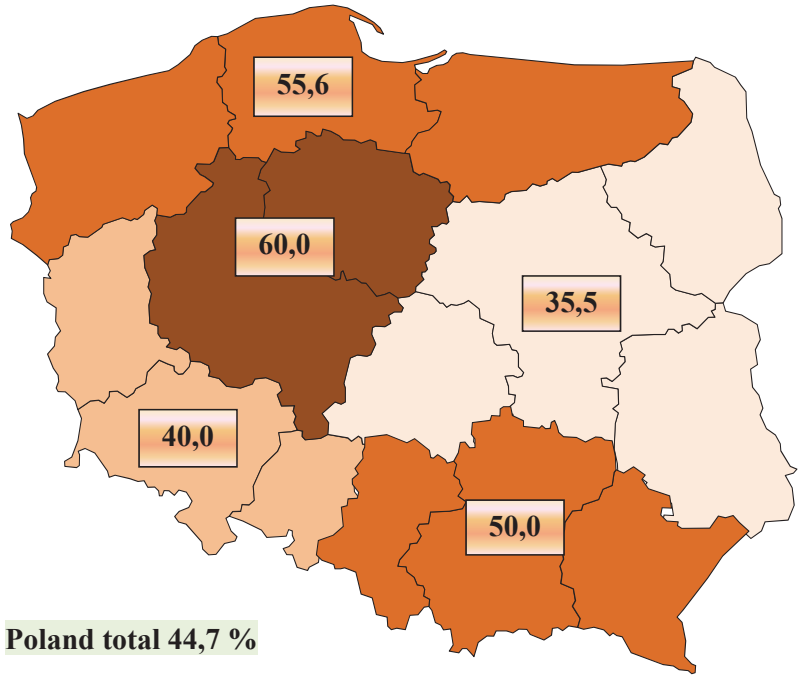


Macroregions:

⇨ Central-Western (voivodeships: Kujawsko-Pomorskie and Wielkopolskie);
⇨ Central-Eastern (voivodeships: Mazowieckie, Lubelskie, Łódzkie and Podlaskie);
⇨ South-Eastern (voivodeships: Małopolskie, Podkarpackie, Śląskie and Świętokrzyskie);
⇨ South-Western (voivodeships: Dolnośląskie, Lubuskie and Opolskie);
⇨ Northern (voivodeships: Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie).

Source: based on the IAFE-NRI survey 2011.

Map A.5. Percentage of the villages with the political party members, by selected macroregions

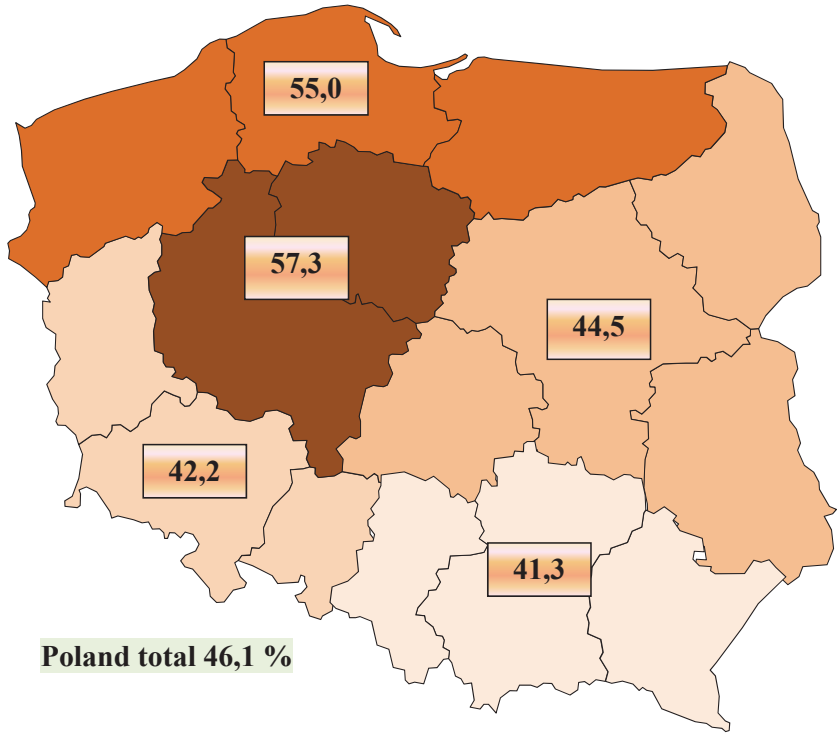


Macroregions:

⇨ Central-Western (voivodeships: Kujawsko-Pomorskie and Wielkopolskie);
⇨ Central-Eastern (voivodeships: Mazowieckie, Lubelskie, Łódzkie and Podlaskie);
⇨ South-Eastern (voivodeships: Małopolskie, Podkarpackie, Śląskie and Świętokrzyskie);
⇨ South-Western (voivodeships: Dolnośląskie, Lubuskie and Opolskie);
⇨ Northern (voivodeships: Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie).

Source: based on the IAFE-NRI survey 2011.

Map A.6. Percentage of the villages with the sports club members,
by selected macroregions



Macroregions:

- ⇨ Central-Western (voivodeships: Kujawsko-Pomorskie and Wielkopolskie);
- ⇨ Central-Eastern (voivodeships: Mazowieckie, Lubelskie, Łódzkie and Podlaskie);
- ⇨ South-Eastern (voivodeships: Małopolskie, Podkarpackie, Śląskie and Świętokrzyskie);
- ⇨ South-Western (voivodeships: Dolnośląskie, Lubuskie and Opolskie);
- ⇨ Northern (voivodeships: Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie).

Source: based on the IAFE-NRI survey 2011.

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