

THE PERSPECTIVES OF FAMILY FARMS IN POLAND

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Abstract

Poland's accession to the European Union resulted in acceleration of the transformation of agriculture which followed the path of agriculture development of economically developed countries. This transformation consists in a decrease in the number of farms, a drop in the share of agriculture in the social farm structure, but also a growth in the potential and production, land productivity, in particular farm labour productivity, while maintaining huge differentiation between farms. Analysis of the farm structure survey data carried out by the Statistics Poland between 2005 and 2016 points to speeding up the transformation of agriculture in Poland in the indicated direction. The analysis also enables to prepare a scenario of changes on family farms in the period up to 2030. When the scenario deviates from the desired direction – also under the influence of new circumstances – it is possible to take up policy actions to correct the scenario to some extent. The essence of these changes comes down not to the EU Common Agricultural Policy, but rather to national policies and also goes beyond the traditional scope of agricultural policy.

Keywords: transformation of agriculture, family farms, projection, policy.

JEL codes: O11, Q18, Q 48.

Introduction

The fundamental challenge faced by agriculture and the whole food system is to ensure food security, ecological security and social cohesion. The *sine qua non* condition for this challenge is to take a course towards the sustainable development – in a particular case – of agriculture. This is generally not questioned –

despite the ambiguity or undetermined boundaries of these concepts, in particular, the sustainable development concept. However, the differences of views emerge when answering the question whether this challenge will be more effectively coped with by family farms or non-family farms. The important difference between them comes down to labour inputs. The former are mainly based on family labour while the latter – on hired labour¹. Both the former and the latter have various forms. In the case of family farms, these are, *inter alia*, traditional rustic farms, hobby farms, auxiliary farms and, above all, professional (independent, farmer) farms. In the case of non-family farms, these are, e.g. agricultural enterprises of natural persons (including farmers), corporate enterprises, cooperative farms and companies.

During the more than 10 thousand years of history of agriculture, family farms have not changed much. Only the period of the last 300 years has resulted in enormous changes in those farms in the countries which are currently well-developed economically. This was stimulated by the development of capitalism, which created conditions for simply revolutionary transformations of agriculture. These transformations threatened the very existence of family farms, especially in their rustic form². According to the classical authors³, those farms were supposed to be transformed into agricultural (capitalist) enterprises and/or collective (cooperative) farms. History only partially confirmed this direction of transformations, because – as it turned out – family farms not only survived even in well-developed countries but new ones were also created (Ploeg, 2009). But then, in less developed countries, family farms – even in their rustic form – are still dominant, being a specific *opus magnum* of the modern world⁴. New developmental conditions change the standpoint on the versatility of the way in which family farming is transformed, synthetically included in the metaphor “from peasant to farmer and agricultural businessman”, perfectly illustrated by Tomczak (2005)⁵. Currently, this path, in the case of less developed countries, is questioned, as the historical

¹ Of course, there are more differences, but they are not a subject of consideration in the article.

² We can now assess the magnitude of changes by comparing American farms with rustic farms in Africa – just by sailing along the Nile.

³ This name determines, first of all, Marx, Engels, Lenin, Kautsky.

⁴ The number of family farms is estimated at more than 500 million – with the domination of small farms of up to 2 ha. More than 2 billion people are associated with them; including nearly 1.5 billion professionally active people, which is a reason for which family farms are still the largest sector in the world economy. These farms use 75% of agricultural land and produce 80% of global food (FAO, 2014, p. 8) and the value of their agricultural production is estimated at USD 2.2 trillion (Graeb i in., 2016, p. 3), exclusive of non-market values, especially environmental ones.

⁵ As regards the versatility of the industrial path of agricultural development, it is worth to identify the principles regarding the share of agriculture in the structure of the national economy (the downward trend of the share of agriculture in employment, creation of the GDP and meeting the final demand) and the increase in the labour productivity (pursuit of the industrial sector) as well as the principles regarding the change in the form (organisational and socio-economic forms) of agricultural entities. The former can indeed be considered universal, which can be explained in a logical manner, while the latter are not so obvious. En masse, rustic farms are being replaced by family farms and family agricultural enterprises, but it is not yet determined that they will be replaced by corporate agribusiness companies.

time is different and modern conditions are different either. Present rich (developed) countries, when they took part in the structural transformation (the *take-off* phase of economic growth), had a smaller population and a lower natural growth and practically unlimited possibilities of migration to colonies than present less developed countries.

Furthermore, the then production technologies in the industry and other non-agricultural manufacturing sectors have been more labour-intensive, which means that those sectors could absorb more labour force. Today, technologies are generally labour-saving and capital – intensive and the supply of industrial products is excessive – it exceeds the demand. The problem is not the production of more industrial products, but the insufficient demand. In addition, even assuming the possibility of rapid expansion of industry and services in less developed countries dominant in terms of the population, the threat of an environmental and climate disaster of the Earth would be accelerated with the real technologies available. For this reason, formulas suggested at the end of the 20th century and at the beginning of this century by the World Bank and the International Monetary Fund to less developed countries, so that they turned agricultural technologies into industrial ones, i.e. accelerated the concentration and specialisation processes in agriculture, have not been successful. Further proceeding according to those formulas would result in accelerating the process of mechanisation of less developed countries – exceptionally labour-intensive and capital-saving. In the longer term, this is, naturally, desirable, but now if these countries had achieved agriculture mechanisation level as in well-developed countries this would release at least 3/4 of global labour resources involved in agriculture. This in turn would increase more than twice the global army of the unemployed, with the catastrophic economic, social and political consequences of this state of affairs (Mazoyer and Roudart, 2006, pp. 19-20).

In terms of economic development, Poland has achieved the status of a well-developed country which does not correspond to a relatively large number of small family farms dominant in agriculture. This is a historical legacy whose causes are known (Zegar, 2018a). The systemic transformation launched in 1989 and the accession to the European Union in 2004 have a strong impact on the dynamics of transformations of family farms. In particular, it is about covering Polish agriculture with the Common Agricultural Policy (CAP) mechanisms, as well as about the development of non-agricultural sectors and the growing aspiration of the population. In this situation, a question arises about the prospects of family farms in Poland, which is obviously important for current farmers and their potential successors, as well as for non-agricultural sectors of the economy and non-agricultural populations – urban and rural. Undoubtedly, the transformation of the Polish agriculture follows the path designated by the Western European countries. The pros and cons of this path have been repeatedly described. In contrast, in the light of the new challenges and conditions, it is important to reflect on the inevitability of following this path, including, in particular, the strive for achieving the level of industrialisation of agriculture characteristic of the Western European

countries, and the more of American agriculture⁶. But in the present world subject to globalisation, is it possible to choose freely the path other than industrial one? It seems reasonable to target at socially sustainable agriculture (Woś and Zegar, 2002), aimed at social welfare, while using the achievements of scientific and technological progress, as well as technologies of precision farming, organic farming, agrobiological farming, and by analogy to the agricultural industry 4.0. This requires a prudent and holistic transformation of agriculture.

So what is the future of family farms in Poland? Seeking the answer to this question constitutes the main objective of the article. In essence, it is about the identification of factors affecting the future of family farms and policy options affecting the trajectory of transformations of these farms.

Approach and data sources

Outlining the prospects of family farms is not a forecast, although it is helpful in developing scenarios and possibly forecasts. On the other hand, the point is to determine quantitative changes (number of farms, production potential) and changes in production organisation and technologies. It is also about the situations that may arise in the future with regard to determinants of factors of changes in family farms. When outlining the prospects, it is necessary to define, first of all, the time (horizon), as for shorter periods more important for the course of changes is inertia of the existing system, while in the longer term exogenous factors are decisive. In this article, the horizon ends with 2030 and, therefore, is not relatively distant, which means that inertia will play an important, perhaps even key, role. Thus, of basic importance is the extrapolation of existing trends in development of family farms. The starting point is to analyse changes in private farms in the period between 2005 and 2016, so after the accession of Poland to the European Union, when Polish agriculture started arduously to catch up on agriculture in Western European countries⁷. The factual material was provided by the results of the agricultural structure survey conducted by GUS in 2005 and 2016 – generalised for whole agriculture. Due to methodological changes, including the definition of a farm, the comparable data is possible for a group of private farms with utilised agricultural area kept in good

⁶ Industrial transformation of agriculture is inherently linked to the enlargement of the area and economic size of family farms. However, the question about the concentration ceiling is not unfounded, taking account not only of the economy. It is worth reflecting on an example of the industry, which has already passed the concentration phase – large factories. On the horizon, there are symptoms of a slowdown on the industrial path and the search for a fundamentally different model of agricultural production. The question arises whether such a direction of agricultural transformations is inevitable and desirable, as well as whether the pursuit impelled or necessitated by the competitive market makes any sense. It is worth noting that some East Asian countries have succeeded in agriculture without concentration (Hayami and Ruttan, 1985), but modern development conditions result in agricultural concentration in these countries, although at a relatively low level.

⁷ According to the data of economic accounts for agriculture in 2004-2017, the labour productivity (EUR thousand/AWU) in the agriculture sector in Poland increased 2.5 times and in the EU-15 (the so-called old EU countries) 1.5 times (as a result of the faster growth of agricultural production and a greater decrease in employment in Poland). However, the labour productivity in Polish agriculture still accounts for only 21% of the labour productivity in the EU-15 (2004, 12%). Also, labour payment in the agricultural sector in Poland increased 3.5 times, while in the EU-15 – 1.5 times.

agricultural and environmental conditions (GAEC) of 1 ha and more. This group of farms is subject to further analysis. Farms from this group in 2016 accounted for: 91.6% of total agricultural area, 91.5% of UAA in GAEC, 88.0% of livestock (LU) and 87.3% of Standard Output (SO).

The group of private farms (or: family farms) is very diverse under many respects. What is usually pointed out, is the diversity of the area (agrarian structure) and the economic size (economic structure). The use of data for the entire group of analysed farms or of averaged data per farm, if allowed in comparative analyses, is insufficient in the event of outlining the prospects. In place of the past area structure of farms, the article used the socio-economic criterion for which dominant sources of family livelihood (agricultural income or income from other sources) and dominant place (way) of conducting the production (market or consumer self-supply) have been adopted. The orientation of the farm towards the market production or towards self-supply is essential for the organisation of the farm. In the first case, the farm is subordinated to the market logic in terms of the production structure, technologies (production methods) and economic account. On the other hand, self-supply farms are not driven by the market logic, and even when they use economic account, it differs significantly from classic account oriented towards obtaining the maximum economic benefit. In the case of agricultural income, if it constitutes the predominant source of livelihood for the family, it significantly affects the approach to the farm. If this income is satisfactory, the farm may be treated as professional (independent) regardless of the area of utilised agricultural area. However, if income is not satisfactory, there is a problem with the future of the farm. The farms in the identified group have been then grouped into four socio-economic types, namely: A – farmers' (professional, farmer)⁸ farms when agricultural income and sale to the market are dominant; B – two-job farms when sale to the market is dominant, while agricultural income is not a dominant source of livelihood; C – hobby farms when self-supply is dominant and agricultural income is not a dominant source of livelihood and D – rustic farms when agricultural income and self-supply production are dominant (Scheme 1). Of particular interest are type A farms, because they dominate in agriculture and, to a lesser extent, type B farms, as they provide support (reservoir) of the development for the group of type A farms. But type D farms are disappearing while the destiny of type C farms is determined by cultural factors and alternative food systems.

⁸ There is no "good" term for this form of the farm: GUS in household budget surveys uses the name "farmers' farm"; In the past, the term "serf farms" or "independent farms" were used, currently, we used the terms "farmer farms" or professional farms, sometimes "market farms" or "commercial farms" (ranges of farms referred to by these terms usually go beyond type A farms).

Socio-economic criteria and types of private farms

Specification		Income criterion	
		Agricultural income	Non-agricultural income
Production implementation criterion	Market	A (professional)	B (auxiliary)
	Self-supply	D (rustic)	C (hobby)

Source: own study.

The identified types of private farms are of different importance for agriculture as well as different prospects for development. As a result, changes in basic characteristics of the identified types of farms have been presented first and then a baseline scenario has been developed based on the slightly modified extrapolation of trends from 2005 to 2016. This scenario is not a forecast, but is a reference point for assessing the status according to this scenario in the year closing the prospect (2030) and a starting point for reflections on the prospects of family farms and, in particular, factors that may result in a deviation of the actual trajectory of development of family farms from the baseline scenario and the development policy of such farms.

Family farms after the accession to the European Union

When presenting the results of the analysis of the identified group of farms – i.e. private farms with an area of 1 ha and more of UAA in GAEC – the authors limited themselves to: the number of farms and production potential and to the area structure and economic structure – while identifying the above-identified socio-economic types. At the beginning, farms from the analysed group have been presented against a background of all farms in Poland (Table 1) – so as to illustrate the importance of farms from the identified group in total agriculture.

In the group of analysed private farms, in terms of the number, the first place is occupied by type B farms. This is an aftermath of two-job (peasant-worker)⁹ farms, developed in the period of national industrialisation, and this process, over time, was subject to differentiation towards auxiliary and hobby farms. On the other hand, in terms of the production potential, type A farms are dominant, to which type B farms and, all the more, type C and D farms are significantly inferior. This is type A farm, which gather the majority of land, labour inputs and standard output and standard gross margin, as well as the population of livestock¹⁰ (Tables 2 and 3). Therefore, the subject of particular interest of the agricultural policy should be type A and B farms – sensitive to market signals and agricultural policy instruments – as they gather the natural potential and their production sent to the market has

⁹ It is worth noting that on two-job farms blue-collar workers are increasingly replaced by white-collar workers, entrepreneurs, retirees and pensioners.

¹⁰ Probably also of fixed assets (as indicated by the data from the 2010 agricultural census – see Zegar (2018a) but the structural survey did not include this feature.

a significant impact on food security of the country. These farms are subject to requirements of market competition which makes them increase the production scale and reduce unit costs. On the other hand, type C farms, having a significant area of UAA (1.4 million ha) should be the subject of interest of the policy due to this land, but also the role of hobby production in nutrition, preservation of biodiversity and landscape, supporting local markets and viability of rural localities.

Table 1

Farms in Poland in 2005 and 2016

Specification	Farms in total (thousand)		Farms with legal personality		Private farms ^a (thousand)		Analysed farms ^b (thousand)	
	2005	2016	2005	2016	2005	2016	2005	2016
Number of farms ^c	2 476.5	1 410.7	3 644	4 129	2 472.8	1 406.6	1 723.9	1 398.1
Total area, thousand ha	17 424	1 6236	1 822	1 353	15 602	1 4884	15 131	14 870
Area of UAA, thousand ha	15 320	1 4543	1 592	1 249	13 729	13 294	13 424	13 288
Area of UAA in GAEC, thousand ha	14 755	1 4406	1 423	1 223	13 332	13 183	13 060	13 181
Population of livestock, thousand LU ^c	7 141	6 732	528	587	6 613	6 145	6 430	5 924
Labour inputs, thousand AWU ^d	2 292	1 676	45	41	2 247	1 635	2 035	1 617
Standard output, million EUR	23 551	25 012	2 057	2 686	21 495	22 326	20 824	21 824
Standard gross margin, million EUR	13 522	12 372	1 154	1 107	12 368	11 265	1 196	11 143
UAA/farm, ha	6.19	10.31	436.77	302.51	5.55	9.45	7.79	9.50
Standard output (SO)/ farm, EUR thousand	9.51	17.73	564.38	650.50	8.69	15.87	12.08	15.61
Standard gross margin (SGM)/farm, EUR thousand	5.46	8.77	316.68	268.03	5.00	8.01	6.94	7.97

^a Farms according to the classification (definition) of GUS in 2005 and 2016; ^b Farms according to the same classification (with an area of UAA in GAEC of 1 ha and more); ^c Livestock units; ^d Annual work unit (AWU) – equivalent to 2,120 hours of work a year.

Source: compiled based on GUS survey of the agricultural structure from 2005 and 2016 calculated in the Statistical Office in Olsztyn for the purposes of the Multi-Annual Programme 2015-2019 (task “Dilemmas of sustainable agricultural development in Poland”) implemented at IERiGŻ-PIB in Warsaw.

Table 2

Number and production potential of family farms by socio-economic types in 2005 and 2016

Specification	Total	Socio-economic types			
		A	B	C	D
2005					
Number of farms (thousand units)	1 724	526	671	432	95
Total area (thousand ha)	15 131	8 732	3 910	1 595	894
Utilised agricultural area in GAEC (thousand ha)	13 061	7 880	3 240	1 169	772
Arable land (thousand ha)	9 902	6 250	2 364	726	562
Labour input (thousand AWU)	2 035	956	574	360	145
Population of livestock (thousand LU)	6 430	4 585	946	428	471
Standard output (SO) (EUR million)	20 824	13 891	4 091	1 540	1 302
2016					
Number of farms (thousand units)	1 398	429	506	428	35
Total area (thousand ha)	14 870	9 105	3 739	1 800	226
Utilised agricultural area in GAEC (thousand ha)	13 181	8 372	3 207	1 416	186
Arable land (thousand ha)	9 766	6 526	2 423	691	126
Labour input (thousand AWU)	1 617	817	427	322	51
Population of livestock (thousand LU)	5 924	5 184	570	133	37
Standard output (SO) (EUR million)	21 823	16 605	3 882	1 140	196

Source: as in Table 1.

Table 3

Structure of the production potential of farms of identified socio-economic types in 2005 and 2016 (total = 100)

Specification	A		B		C		D	
	2005	2016	2005	2016	2005	2016	2005	2016
Number of farms	30	31	39	36	25	30	6	3
Total area	58	61	26	25	10	12	6	2
Utilised agricultural area in GAEC	60	64	25	24	9	11	6	1
Arable land	63	67	24	25	7	7	6	1
Labour input	47	51	28	26	18	20	7	3
Population of livestock	71	88	15	10	7	1	7	1
Standard output	67	76	20	18	7	5	6	1
Standard gross margin	66	73	21	20	8	6	5	1

Source: as in Table 1.

A significant decline in the number of farms took place in the analysed period. In particular, this applies to traditional rustic farms (type D). The number of type B farms decreased by 1/4 and of type A farms by less than 1/5. Type C farms were temporarily not subject to a downward trend, which can be explained by the conditions of CAP transfers¹¹. An important characteristic of changes is the strengthening of domination of type A farms with respect to the production (SO) and economic gross margin (SGM)¹². Farms of this type, with a deepening internal differentiation, increase, in particular, their advantage in the livestock production (Fig. 1), although the share of farms keeping livestock also decreased in farms of this type from 84% in 2005 to 68% in 2016 (in the whole group family farms, respectively, from 72 to 51%). Thus, the general trend consists in the professionalisation of type A farms and the gradual withdrawal of farms of other types from the agricultural activities.

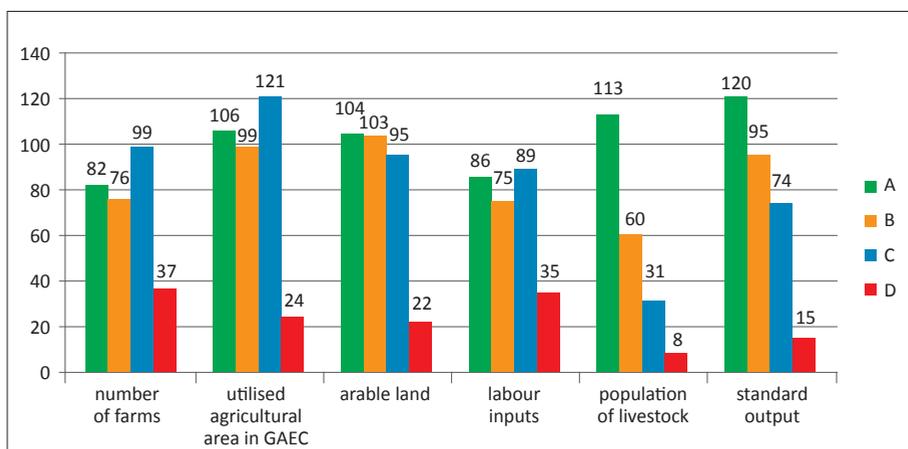


Fig. 1. Socio-economic types of family farms: changes in 2005-2016 (%).

Source: developed based on the data as in Table 1.

¹¹ Making area payments conditional upon the compliance with the requirements provided for by the cross-compliance principle resulted in bringing the significant area of UAA back to agricultural use (this bringing back is probably in part formal and in part means informal lease by mostly type A farms). Throughout agriculture, the area of UAA decreased by 780 thousand ha in the period of 2005-2016, while the area of UAA in GAEC increased by about 350 thousand ha. In the analysed group of farms, the area of UAA decreased by 136 thousand ha, while the area of UAA in GAEC increased by about 140 thousand ha. Interesting is the case of type C farms, where, in connection with the CAP transfers, almost 200 thousand of new farms appeared (mostly virtual, only statistical) that brought back to use about 740 thousand ha of UAA of which about 720 thousand ha are UAA in GAEC.

¹² Changes in the standard output and standard gross margin relate to the volume as the same conversion rates have been applied for both years. The actual volumes of these categories established with a different set of conversion factors are slightly higher.

Type A farms dominate over farms of other types by several times (Table 4). Over the last 11 years, the average area of farms of this type (A) has increased by 30% and the standard output volume by 46%. Although these farms provide dominant income to families using them, the amount of that income differs *in minus* from parity income. The agricultural structure studies do not contain information on the amount of income, but based on the data of household budgets and the FADN, it can be determined that if these farms were to achieve income at the level of parity income, it would require *ceteris paribus* to increase their area of UAA by nearly 10 ha of UAA, as currently the area of UAA of the farm with parity income is up to 30 ha (before the accession it was slightly more than 20 ha).

Table 4

*Production and economic potential of identified types of farms in 2005 and 2016
(on average per farm)*

Specification	Total		A		B		C		D	
	2005	2016	2005	2016	2005	2016	2005	2016	2005	2016
Arable land (ha)	7.8	9.5	15.1	19.6	5.0	6.4	3.0	3.4	8.4	5.4
Labour inputs (AWU)	1.2	1.2	1.8	1.9	0.9	0.8	0.8	0.8	1.5	1.5
Population of livestock (LU)	3.7	4.2	8.7	12.1	1.4	1.1	1.0	0.3	5.0	1.1
Standard output (EUR thousand)	12.1	15.6	26.4	38.7	6.1	7.7	3.6	2.7	13.8	5.7
Standard gross margin (EUR thousand)	6.9	8.0	14.9	18.9	3.7	4.4	2.1	1.6	7.8	3.4

Source: as in Table 1.

Family farms are greatly differentiated in terms of their area and economic size and, therefore, in terms of labour payment. This differentiation is an immanent feature of such farms. This was valid in the past and still is. This applies in particular to type A farms, among which only about 1/4 have labour payment (agricultural income after deducting the cost of own capital and land) at the level of parity income. Such farms shall be defined as economically viable (O'Donoghue et al., 2016)¹³.

An important and, in historical and average terms, primary factor differentiating family farms is the area of UAA. When we limit ourselves to type A and type B farms which are relevant for the future of family farms, it is necessary to note, as a positive phenomenon, the progressive *quasi*-polarisation of the area structure. This implies a decline in the share of farms from the central group (medium-sized farms) in favour of farms whose area is more than medium-sized, with the maintained share of farms from the lowest area group (Table 5). Similar is the structure of type A and type B farms by standard output, although in this case the differentiation of type B farms is much higher (Table 6).

¹³ We can also encounter the determination of the economic viability of the farm by complying with the market competitiveness requirement (Ziętara and Zieliński, 2012).

Table 5

*Structure of type A and B farms by area of UAA in 2005 and 2016
and the number of farms in 2016*

Area groups	A		B		Number of farms in 2016 (thousand)	
	2005	2016	2005	2016	A	B
Total	100.0	100.0	100.0	100.0	429	506
1-5	20.2	18.2	68.2	59.4	78	301
5-25	67.6	62.0	30.7	38.4	266	194
25-50	9.2	13.1	0.8	1.5	56	8
50-100	2.2	4.7	0.2	0.5	20	2
>100	0.8	2.0	0.1	0.2	9	1

Source: as in Table 1.

Table 6

Structure of farms by standard output of type A and B farms in 2005 and 2016

SO groups (EUR thousand)	A		B		Number of farms in 2016 (thousand)	
	2005	2016	2005	2016	A	B
Total	100	100	100	100	429	506
Up to 8	22.7	22.8	77.7	75.4	98	381
8-25	43.8	23.4	19.8	16.3	100	82
25-50	22.0	25.2	2.0	6.0	108	31
50-100	8.8	21.7	0.4	1.8	93	9
>100	2.7	6.9	0.1	0.5	30	3

Source: as in Table 1.

Changes in the agrarian (area) structure and economic structure of family farms are important in the context of the future of these farms. Some of these farms will abandon agricultural activity or take up hobby agricultural activity, while less numerous farms of this type will be oriented towards business agricultural activity. In the case of type A farms, the following options can be selected: (1) enlargement of farm resources (land and other production factors); (2) increase in the economic strength of the farm by implementing innovations (also those reducing production costs) and changing the production structure (for example, in favour of products with higher added value, including, in particular, high-quality products); (3) taking up non-agricultural activities either based on farm assets or not associated with them; (4) taking up paid employment outside the farm while keeping

the farm (i.e. generally, becoming type B); (5) liquidation of the farm (sale, lease). Such options are also faced by type D farms, but of decisive importance in this case is the human factor while option (1) is rare. In type B farms, as non-agricultural income increases, the most probable option will be to become type C or to liquidate the farm; a small fraction of farms of this type will continue to conduct the commercial agricultural production and only few will select the option of the professional farm.

In type A farms, there is an increase in the economic strength measured by standard output: the share of farms with the low economic strength (up to EUR 25 thousand) decreased from around 2/3 in 2005 to below 1/2 in 2016. Assuming that the economic size of the viable farm should be at least EUR 50 thousand, it is easy to calculate that the number of such holdings in the type A group is about 123 thousand farms. When we include farms of other types meeting this criterion (only about 12 thousand), we can see that the threshold of economic viability is met by about 135 thousand farms. It can, therefore, be estimated that the number of economically viable family farms will not exceed 150 thousand in the coming few years. However, the number of economically viable farms may also be reduced if the requirements regarding the standard output volume (the threshold of economic viability) increase more than this output.

The general conclusion from the data submitted is that type A farms are development-oriented – most of them link the future with agricultural activity. Other farms of this type will progressively join the group of other types of farms or become liquidated. In the first case, changes are mainly necessitated by economic relations (the need to increase the production scale resulting from competition in the market and rising wages in non-agricultural sectors), while in the second case there is an inability to face competition and the lack of successors. The type A farms mostly stand astride between agricultural and non-agricultural orientation, but the fact is that the scale is increasingly turned towards the latter, while C and D type farms are gradually withdrawing from agricultural activity, although some will stay there for non-economic reasons: preferences (type C) or necessity (type D). Therefore, the further course of industrial transformation of family farming will be primarily determined by the fate of type A farms and, to a lesser extent, of type B farms, while the fate of other types will not play any greater role.

The perspective of family farms is determined by demographic change. In the period of 2017-2030, the working age population – according to GUS forecast – will decrease by 700 thousand, while the non-working age population will increase by nearly 1.8 million people¹⁴. In the countryside by, respectively, 250 thousand and 900 thousand (GUS, 2018, p. 209, Table 5(133) and p. 227, Table 30(158)). For farm users, the average age of users is increasing and this applies to all farm types. Attention is drawn by the relatively large share of users aged 65 and more in type C (18%) and in type B (12%). Taking into account the share of farms held by

¹⁴ The working age population is understood as males aged 18-64 and females aged 18-59; the non-working age population – males aged 65 and more and females aged 60 years and more.

users aged 45-64 (in the type C group – 54%, in the type B group – 52% and in the type A group – 60%), it can be assumed that in the perspective of 2030, almost half of farms of these types will change the user (mainly to the benefit of successors) or will be liquidated¹⁵.

Direction and scale of transformations of family farms by 2030

The analysis of changes in individual agriculture indicates that in Poland there is undoubtedly a farmer's path to the development of agriculture *in statu nascendi*, which, after the accession to the EU, was accelerated, paradoxically despite the fact that the CAP weakens the operation of the market treadmill (Czyżewski, 2017). Assuming a continuation of changes observed in 2005-2016 (extrapolation of the trend with a slight modification), the approximate number of farms in 2030 has been determined at about 300 thousand of type A farms, similarly as in the case of type B farms. This working scenario that has been specified as baseline, ignores type D farms – as those which are virtually disappearing from the scene and type C farms – being of no major production importance, which are largely determined by various and unpredictable factors (Table 7)¹⁶.

Table 7

Baseline scenario (of extrapolation) of type A and B farms

Specification	2016		2030	
	A	B	A	B
Number of farms, thousand	429	506	300	300
Area of UAA in GAEC, million ha	8.4	3.2	9.1	2.9
Labour inputs, thousand AWU	817	427	600	270
Standard output, EUR billion	16.6	3.9	21.0	3.8
Arable land in GAEC/farm, ha	19.6	6.4	30.3	9.6
Labour inputs/farm, AWU	1.9	0.8	2.0	0.7
Standard output/farm, EUR thousand	38.7	7.7	70	12.5

^a volume

Source: own study.

¹⁵ With respect to users, it is worth noting the growing percentage of users with higher education, which increased on family farms from 6.5% in 2005 to 15.8% in 2016, while in type A farms it increased, respectively, from 3.8% to 11.7%, in type B farms from 10.1% to 20.5%, type C farms from 5.1% to 15.3% and type D farms from 1.6% to 4.0%. Higher general education is dominant, especially on type B farms (17.4% in 2016) and type C farms (13.8% in 2016).

¹⁶ However, farms of these types have (2016) 1.6 million hectares of UAA in GAEC (12.1% of such land in the analysed group of farms) and in 2030 it will be about 1.0 million ha (7.7%). In 2005-2016, the area of UAA in GAEC in this group of farms increased by 120 thousand ha, which was the merit of type C farms (increase by 250 thousand ha), while up to 2030 we should expect the decrease in UAA in GAEC by about 200 thousand ha.

The baseline scenario is not a forecast but can be a reference point for assessments and possible policy actions. This scenario implies a continuation of the agricultural development trend according to the so-called farmer's (industrial) path. Therefore, an important question arises – whether the effects of the baseline scenario are satisfactory from the point of view of the master system? This is an important question that can be asked in many contexts – for example, competitiveness, labour productivity, land productivity, delivery of public goods. The problem is further complicated by the need to take account not only of the economic but also social aspect (for example, economic competitiveness versus social competitiveness, economic and social labour productivity, public goods versus anti-public goods). Even in the light of these observations, the answer to the question asked is not easy.

The criteria for assessing the level (state) of agriculture in the baseline scenario must be linked to the national policy objectives. These objectives can be taken as four types of security: food, ecological, economic and social. There are various relationships among them, including the competitiveness and complementarity. In a much simpler way, these types of security can be described as follows. Food security means satisfying the needs of rational nutrition of the country's population based on high-quality foodstuffs – domestic and foreign – with a positive foreign trade balance and meeting the threshold values for other types of security. Ecological security means the production of agricultural products for food and non-food purposes (bioeconomy) in an environmentally friendly way – without increasing pressure on ecosystems. Economic security means satisfying income of farmers, living mainly from agricultural work – parity labour payment and competitiveness. Social security means acceptable (satisfying) living conditions of the agricultural population, the contribution to cultural development, preservation of traditions and promotion of the vitality of rural areas.

The perspective dilemma is to determine whether the identified types of security can be better achieved by family farms or other forms of farms, including, in particular, capitalist agricultural enterprises? In the concept of socially sustainable agriculture, the priority is given to family farms (Woś and Zegar, 2002) which will undoubtedly dominate by 2030. This will include farms with larger production scale. This is the inevitable effect of the extending scissors of agricultural prices (a faster rise in prices of means for agricultural production than in agricultural prices) and the rise in remunerations in non-agricultural sectors, which creates a strong pressure on the concentration and specialisation in agriculture, so that the remuneration for the farmer's labour inputs (agricultural income) did not differ significantly from the income parity. It was found that in 2005-2016, remunerations of those employed in the national economy rose almost 6 times, the prices of means for agricultural production – more than 3 times and the selling prices of agricultural products – more than 2 times. In such conditions, obtaining higher income by farmers required increasing the production, which eliminated economically weaker (smaller, minor) farms (Józwiak, Mirkowska and Ziętara, 2019). There is no single formula for such farms. It depends on the situation.

The change in the agrarian and economic structure¹⁷ is necessary and that of the social structure is advisable. The agrarian and economic structure relates, in fact, to professional farms. In contrast, the social structure relates to the share of professional, auxiliary and hobby farms in the production potential of agriculture and agricultural production. As regards changes in the agrarian structure, the objectives related to food security, labour productivity and environmental protection must be balanced¹⁸. There is still an inversion of the land productivity (the highest land productivity is in the area group of 25-50 ha), while the labour productivity increases as the area increases (Table 8). There is, therefore, a problem of social valuation of the land productivity and labour productivity. In microeconomic account, i.e. from the point of view of families using agricultural farms, at the industrial stage of development the labour productivity is somehow in the lead, which was perfectly justified by Blohm (1969). On the other hand, in macroeconomic (social) account, we must seek a point of equilibrium between the land productivity and the labour productivity which moves upward along with the socio-economic development. In the past, the land productivity was determined primarily by the work/land relationship, which has now been levelled by the agricultural technique. However, the land productivity (SO/ha) is still lower on farms from the higher area groups, while the labour productivity – on the contrary: not only it is higher, but it also grows faster on farms from the higher area groups. This applies not only to Poland but also to the other EU countries, including the FRG (see Józwiak, Mirkowska and Ziętara, 2019, Tables 7 and 9).

Table 8
Land productivity and labour productivity on family farms by area groups in 2005 and 2016

Specification	1-5 ha		5-25 ha		25-50 ha		50-100 ha		>100 ha	
	2005	2016	2005	2016	2005	2016	2005	2016	2005	2016
Land productivity (SO/ha)	1.57	1.53	1.67	1.73	1.68	1.80	1.45	1.60	1.18	1.42
Labour productivity (SO/AWU)	4.46	4.76	10.70	12.74	25.59	28.10	39.90	42.12	73.14	79.43

Source: as in Table 1.

Differences in the labour productivity among area groups of farms are persistent and even slightly increased. For example, in 2005 the labour productivity in the group of farms above 100 ha was 16.5 times higher than in the group of 1-5 ha and in 2016 – 16.8 times. The analyses also point to the divergence of economic and ecological objectives (Zegar, 2018a).

¹⁷ Cf. Tables 5 and 6.

¹⁸ The issue of changes in the sustainability of family farms has been ignored in the article – it has been discussed in the study by (Zegar, 2018b).

In the context of demography and non-agricultural remunerations, the issue of hiring in agriculture arises. The share of hired labour (permanent and seasonal/casual) in total labour inputs (AWU) in the analysed population increased from 3.8% in 2005 to 7.3% in 2016. This was the case in all area groups – apart from the highest one, where hired labour dominates – and in the economic size groups – apart from the smallest one (Fig. 2). The rise in remunerations on the non-agricultural sectors may inhibit the increase in demand for hired labour force in family farms due to the cost of hired labour. This, in turn, affects the course of processes of concentration and specialisation of production in agriculture, including, in particular, the conversion of family farms into capitalist agricultural enterprises as supposed by the classical authors.

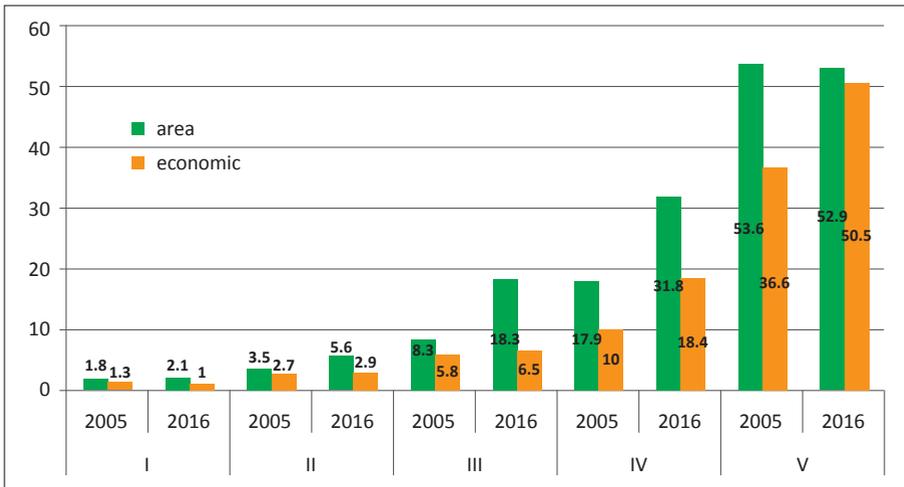


Fig. 2. Share of hired labour in total labour inputs in private farms, by classes, in 2005 and 2016 (%). Area (and economic) classes: I – 1-5 ha (up to EUR 8), II – 5-25 ha (EUR 8-25), III – 25-50 ha (EUR 25-50), IV – 50-100 ha (EUR 50-100), V – 100 ha and more (EUR 100 and more).

Source: developed based on the data as in Table 1.

Hiring on family farming is not a new phenomenon, as it has already existed in the distant past, if the potential of family labour was too small in relation to the size of the farm. Serf farms had numerous farmhands. In the analysed period, the share of hiring in labour inputs of the analysed farms increased from 3.8% to 7.3% of overall labour inputs (in AWU), including in type A farms from 6.1% to 12.2% and in type B farms from 1.4% to 7.9%. The characteristic feature is the increase in permanent hiring: in type A farms from 1.4% to 7.9% of labour inputs and in type B farms from 1.4% to 1.8%.

In the context of hiring, there is a phenomenon of private farms with the domination of hired labour force, which acquire the features of capitalist companies in classical terms. Public statistics do not single them out from all private farms, treating, *de facto*, all private farms as family farms. Based on the agricultural structure

surveys, the characteristics of private farms where hired labour force predominates (table 9) have been established. In 2005-2016, the number of farms where hired labour force dominated, decreased by 28% (from 31.8 thousand to 22.8 thousand) and their share of the total number of analysed farms decreased from 1.8% to 1.6%, while the share of such farms in utilised agricultural area (in GAEC) increased from 6.4% to 8.6% while the level of hiring increased 2.5 times, with permanent hiring increasing as many as 4.9 times and seasonal hiring increasing by only 4%. This points to the strengthening of a certain group of farms with capitalist features which are sufficiently efficient to incur the rising costs of hired labour.

Table 9

Private farms with an area of 1 and more ha in total and where hired labour force dominates, in 2005 and 2016

Specification	All farms		Farms where hiring dominates	
	2005	2016	2005	2016
Arable land/farm (ha)	7.8	9.5	27.3	50.0
Labour inputs/farm (AWU)	1.18	1.16	1.61	5.45
Standard output/farm (EUR thousand)	12.80	15.61	41.58	150.52
Standard output/ha (EUR thousand)	1.55	1.64	1.52	3.01
Standard output/AWU (EUR thousand)	10.23	13.50	25.86	27.64
Farm managers with higher education (%)	6.4	15.8	27.9	37.5
Farmers' farms ^a	37.1	34.1	27.4	63.8
Unpaid labour in labour inputs (%)	95.3	91.6	26.1	24.7

^a A dominant source of livelihood is agricultural activity

Source: developed based on the data as in Table 1.

The prospects of family farms are also affected by policy measures, taken especially when the baseline scenario does not correspond to the objectives adopted in the country's sustainable development strategy, including agriculture. These measures go beyond the traditional production and economic objectives. The area of interest of political institutions (the state) covers the issue of development of family farms in the context of: the socially desirable family farm model, structure of family farms, food security (including the justified level of self-sufficiency), natural environment (including the conservation of agricultural land), income of farmers, viability of rural localities (see, for example, Ellis, 1993; EC, 2017; Zegar, 2018a).

The novelty of the current situation in the policy area is that the basic rules of the game and instruments are the responsibility of the European Union institutions and are set out within the framework of the CAP, which is a basic policy instrument determining the development of farms and stabilises, in periods of several

years, the functioning of farms, including, in particular, transfers of public funds to achieve the objectives set before agriculture and included in the Treaties of Rome. The CAP is still evolving towards the ecological and social objectives of relevant sustainable development concepts (Majewski, Sulewski and Wąs, 2018) – while not neglecting the basic (primary) objectives, in particular, income and food security). It also results in complicating the monitoring and assessment of the CAP's efficiency, as the primary objectives were relatively easy to be quantified, while the ecological (for example, biodiversity) and social (for example, social cohesion) objectives are more difficult to measure and assess.

The CAP still faces the reconciliation of partially divergent objectives: labour productivity and land productivity (and, in the case of a certain percentage of farms, the viability of capital). The labour productivity is important due to labour payment – farm income, since decent income of those employed in agriculture from the beginning (Treaties of Rome, Article 39) was one of the main CAP objectives. The income target remains important as, despite significant transfers of public funds to agriculture representing around 40% of agricultural income, agricultural income per labour unit is, in relation to the average non-agricultural remuneration, about 40% and tends to extend (Hill, 2015; EC, 2017). In Poland, the share of public funds transfers in creating agricultural income reaches 45%, but it decreases and we should expect decreased importance of this income-generating factor, which means that further increasing of income will be mainly determined by the production growth and efficiency (reduction in unit costs) and probably by the remuneration of ecosystem services.

Although the CAP is dominant, it still leaves a significant room for the national policy to potentially revise the trajectory of agricultural development. Also in this case, there is a new situation since the agricultural development is increasingly defined by political instruments going beyond the traditionally understood agricultural policy. There can be many areas of political intervention. Further, we will make some general remarks in relation to some of these areas.

The demand for agricultural products and ecosystem services provided by farms (and agriculture *in corpore*) determines the possibilities of tapping the productive potential. With regard to the food demand, we should expect the increased demand for high-quality food products (including organic farming products) and functional food – as long as they are manufactured with respect for competitiveness or will be supported by public funds. Local food systems create a special opportunity. The enormous possibilities for agricultural products are opened by the bioeconomy, which should be fostered by the change in the ratio of mineral prices and agricultural biomass prices. However, the excessive demand for agricultural products threatens the provision of public goods as well as ecosystem and social services.

Demographic changes – especially the change in the age structure (the ratio of dependants to the employed) and the absolute reduction in labour resources – only partially can be compensated by extending the working time (retirement age) and increasing the employment rate. The labour market situation will lead to the use of labour resources in agriculture, released by the agricultural technology and

concentration of potential and production – increasing the size of farms¹⁹. The rise in remunerations in non-agricultural sectors and ratios of agricultural prices and, at the same time, the increase in aspiration of the agricultural population (the pursuit of income parity – comparable labour payment) will be a strong stimulation for abandoning agricultural activity for the benefit of non-agricultural activity. A certain fraction of farms developing based on hiring of labour force will encounter growing difficulties either due to the lack of hired workers (especially seasonal ones) or due to rising hiring costs, as remunerations related to hiring follow non-agricultural remunerations²⁰.

The role of innovation in increasing the agricultural production is growing, in view of the limited area of agricultural land, it is necessary to reduce inputs of means of production from minerals and growing health and environmental requirements of agricultural products. Among innovations, industrial technologies are dominant (e.g. nanotechnologies, precision technologies, new plant and animal growth promoters) which allow to increase the agricultural productivity, but – as a rule – require increasing the size of farms. This is the case for precision farming practices, the use of satellite navigation, drones, faeces disposal, etc. Innovations are, therefore, an obvious factor affecting farms in the future, and, more precisely, they may jeopardise family farms (Djurefeldt, 2016). Nevertheless, the agricultural technology may also be adapted to the size of farms, to specific needs as part of the smaller scale of agricultural production. In particular, biological progress – the use of interaction of living organisms and plants – may lead to the concentration, but can also serve the small scale of production. Agroecological intensification (Maciejczak, 2018) is possible on farms of various sizes. However, it is necessary to stimulate (encourage) scientific and research institutions to create innovations not only for larger entities.

The law with regard to land management remains an important tool in the hands of politics. Land has been of interest to politics since time immemorial. The problem of land is highly complex, as land is not reproducible and is not movable and, at the same time, is a private (economic) and public (common) good, and even a national good. Hence, the conclusion is that certain restrictions should be imposed on its use, so as not to reduce the benefits of land as a public good. The land ownership is not unlimited and a land owner has not only the rights but also the responsibility to “exercise his right in a socially usable manner” (Marciniak, 2016, p. 119). From the above, it results that the concentration of land in the hands of some entities may diminish general welfare of the society – even in a situation where farms with a huge area dominate over other farms, not only in economic but also ecological terms.

¹⁹ In this respect, important are both external (pull) and internal (push) factors. On the other hand, the agricultural technique simultaneously creates opportunities to increase the scale of production, but also necessitates the increase in this scale. Much depends on the economic relations.

²⁰ We will ignore here the issue of foreign migration, as it is very complex and its interpretation would require a longer reasoning.

Spatial development of rural areas in Poland is undoubtedly the Achilles heel with significant implications for the costs of agricultural transformation and the costs of living in the countryside. For this reason, the imposition of order (or rather preventing the escalation of chaos) in rural areas entails the change in agricultural structures, by stopping the process of concentration in agriculture. In the development of the rural space, we must strive for welfare of rural communities by reconciling the ecological (ecosystem, landscape) objectives with economic (agriculture and other manufacturing sectors) objectives and the vitality of rural localities. This affects the area, economic and social structure of agriculture, which should be taken into account in political elections.

Culture in the context of agricultural transformations covers, first of all, the values followed by farmers. They go beyond the values underlying Neoclassical economics (e.g. greed, growth fetish, microeconomic efficiency). Family or religious values that have been shaped for centuries are still important. An important place in the hierarchy of values is taken by the freedom of choice – also the way of management – provided that this does not contradict the social values such as a common good.

Summary

After the accession of Poland to the European Union and covering the agricultural sector with the CAP mechanisms, transformations in family agriculture accelerated according to the farmer (industrial) model. Over the next few years (by 2030), a continuation of this direction of transformation should be expected.

In outlining the prospects of family farms, it is helpful to capture the differentiation of a group of these farms and, in particular, to identify socio-economic types. In the complex structure of family agriculture, the core are farms which are market-oriented and provide a basic source of livelihood for the user family (type A). Auxiliary farms – market-oriented yet with non-agricultural income providing a basic source of livelihood (type B) are complementary. Based on an analysis of changes in the period of 2005-2016 and expert assessment, it was established that in 2030 the number of type A farms would be approximately 300 thousand (decrease by about 30%), similarly as in the case of type B farms (decrease by about 40%). In particular, in the case of type A farms, they will be farms, on average, with a larger area and a larger scale of production.

The transformation process is increasingly determined by external forces shaped outside the agricultural sector. The point is, in particular, demographic changes, non-agricultural remunerations, competition and policy. In the latter case, it is necessary to distinguish between the CAP and the national policy. The areas of the latter – in addition to the traditional agricultural policy – are the following: the demand for agri-food products, demography, innovations, land management and spatial development as well as culture.

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PERSPEKTYWY GOSPODARSTW RODZINNYCH W POLSCE

Abstrakt

Akcesja Polski do Unii Europejskiej zaowocowała przyspieszeniem transformacji rolnictwa według drogi, którą przechodziło rolnictwo krajów ekonomicznie wyżej rozwiniętych. Transformacja ta polega na spadku liczby gospodarstw rolnych, spadku udziału rolnictwa w strukturze gospodarstwa społecznego, natomiast wzroście potencjału i produkcji oraz wydajności ziemi, a zwłaszcza wydajności pracy w gospodarstwach rolnych przy utrzymywaniu się ogromnego zróżnicowania pomiędzy nimi. Analiza danych z ankiet struktury rolnej przeprowadzonych przez GUS w latach 2005 i 2016 wskazuje na przyspieszenie transformacji rolnictwa w Polsce po tej drodze. Analiza umożliwiła również opracowanie scenariusza zmian w gospodarstwach rodzinnych w okresie do 2030 roku. Gdy scenariusz odbiega od stanu pożądanego – także pod wpływem nowych okoliczności – możliwe są działania polityczne, które w pewnym zakresie mogą go skorygować. Dotyczy to nie tyle wspólnej polityki rolnej UE, co raczej polityki krajowej i to także wybiegającej poza tradycyjny zakres polityki rolnej.

Słowa kluczowe: transformacja rolnictwa, gospodarstwa rodzinne, scenariusz, polityka.

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