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Commission recommendation for Poland's CAP strategic plan

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Recommendations to the Member States as regards their strategic plan for the Common Agricultural Policy

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1. COMMISSION RECOMMENDATIONS FOR POLAND'S CAP STRATEGIC PLAN

In the framework of the structured dialogue for the preparation of the common agricultural policy (CAP) strategic plan, this document contains the recommendations for the CAP strategic plan of Poland. The recommendations are based on analysis of the state of play, the needs and the priorities for agriculture and rural areas in Poland. The recommendations address the specific economic, environmental and social objectives of the future Common Agricultural Policy and in particular the ambition and specific targets of the Farm to Fork Strategy and the Biodiversity Strategy for 2030. As stated in the Farm to Fork Strategy, the Commission invites Poland, in its CAP Strategic Plan, to set explicit national values for the Green Deal targets¹, taking into account its specific situation and these recommendations.

1.1 Foster a smart, resilient and diversified agricultural sector ensuring food security

The agri-food sector in Poland is of great national economic, social and environmental importance. The total share of agriculture, forestry and fisheries in gross value added (GVA) is twice as high as the EU average. Polish agriculture is characterised by diversity in farm structure and potential. The CAP must be used to help Polish farming systems adapt and transform. Enhancing the resilience of the farming sector is both necessary and feasible.

Over time, Poland has become an important part of the internal market, contributing to the EU agri-food sector's position on the global market. However, a significant proportion of farms are managed by farmers aged 55 and older that have no prospects of passing them down to the next generation. Many farmers are also on low income and depend on direct payments. Increasing farms' profitability, income and productivity are key challenges, as is generational renewal.

The agricultural factor income by working unit differs widely between different farm sizes, agricultural sectors and regions, partly due to historical differences between regions in Poland. Policy measures need to take into account both the characteristics of regional food systems and the different types of farms.

Due to a dependency on exports and increasing exposure to the effects of climate change, farm incomes strongly fluctuate. Risk management instruments and strategies therefore need to be put in place to improve farms' resilience to climate, environmental and socio-economic impacts.

The very dynamic growth of the processing and retail sectors stimulates the growth of agricultural production, but at the same time leads to a weaker bargaining position for the primary producers. Farmers should be encouraged to create opportunities to obtain a higher premium for their products, through e.g.: cooperation, better knowledge exchange, use of new technologies and innovations, increased connectivity of producers in rural areas, strengthening of food value chains (including short supply chains particularly for small farms and quality products), or use of targeted financial instruments.

¹ It concerns the targets related to use and risk of pesticides, sales of antimicrobials, nutrient loss, area under organic farming, high diversity landscape features and access to fast broadband internet.

It is important that Poland engage in the digital transition of the farming sector by making good use of the EU's technological capacity in satellite observation, precision farming, geolocation services, autonomous farm machinery, drones, etc., to better monitor and optimise agricultural production processes and the CAP implementation.

1.2 Bolster environmental care and climate action and contribute to the environmental- and climate-related objectives of the Union

Poland needs to improve its performance on many environmental and climate indices, especially greenhouse gas (GHG) and air pollutant emissions, energy efficiency and water availability and by mitigating the risks stemming from intensifying farming practices, in particular for biodiversity in accordance with the Polish prioritized action framework (PAF).

Data from recent years as well as medium-term projections show an increasing trend for non-carbon dioxide (CO₂) emissions from agriculture. This includes soils that account for half of the emissions, as well as stagnating CO₂ removal in the land use, land use change and forestry (LULUCF) sectors. The relatively high emission intensity of the livestock sector (enteric fermentation) and significant energy consumption of the agricultural and forestry sectors are also areas of concern. At the same time, production of renewable energy remains underexploited in terms of energy per livestock unit.

A related concern is the quality of soils in Poland given their relatively low mean organic carbon content, even though the country has a relatively high coverage of peat and peat-topped soils.

In contrast to the EU average, the total area under organic farming in Poland has been steadily decreasing in recent years. While it is clear that this trend must be reversed, other elements of the food supply chain - the processing and the retail sector - need also be considered to improve market outlets for the products. Poland is a country with comparatively higher share of areas farmed with low input intensity. Nevertheless, biodiversity in its agricultural areas is facing challenges as reflected in the downward trend of the farmland bird index, the unfavourable conservation status of the majority of grassland habitats and substantial regional differences in the diversity and density of landscape features.

Water availability is a vital problem, caused partially by the weak water retention capacity in the Polish agriculture, exacerbated by the changing climate. As regards water quality, regional surpluses of nitrogen and phosphorus from the use of animal manure may lead to pollution of ground and surface waters and increasing eutrophication of the Baltic Sea.

1.3 Strengthen the socio-economic fabric of rural areas and address societal concerns

Improving the vitality and attractiveness of rural areas requires investments in rural infrastructure, especially next-generation broadband coverage.

The efforts to promote generational renewal and strengthen social fabric in rural areas should be continued. Though Poland still has a high share of young farmers compared to other Member States, that share is decreasing. It is complex for young farmers and newcomers to start farming, due to constraints on farm succession and access to land.

Addressing these issues through specific financial and technical support as well as provision of advisory services and training is important.

Careful consideration of the specific needs of women in agriculture and rural areas is needed in order to ensure gender equality and close the gender gap in employment, pay, pensions and decision making.

Ensuring the protection of agricultural workers, especially the precarious, seasonal and undeclared ones, will play a major role in upholding the rights enshrined in EU laws that are central to a fair EU food system envisaged by the Farm to Fork Strategy.

Small and medium sized enterprises are becoming more prevalent in rural areas but there are regional disparities. The population in rural areas is shrinking slightly and getting older and the poverty rate is steadily decreasing. To address the age misbalance in rural areas and in the agricultural sector, investment is needed to attract young people and to ensure basic services for the ageing population. It is crucial to bridge the urban-rural divide in terms of digital infrastructure coverage and of basic digital skills. Considerable effort is needed to reach the objective of 100% fast broadband coverage by 2025.

The potential of rural areas for developing the bioeconomy is not sufficiently met, for example the use of biomass from agriculture and forestry (such as woody biomass or crop-derived products) to produce materials. The turnover per person employed in the agricultural bioeconomy is less than half of the EU27 average.

In terms of animal welfare, the persistence of docking of pigs' tails signals the still inadequate conditions on farms that usually motivate this banned practice. Another area of concern is the overreliance on antimicrobials in livestock farming, the sales of which are above EU average. Similarly, biosecurity needs to be stepped up in view of the high risks associated with the presence of African swine fever (ASF).

The volume of pesticides sold when adjusted by risk, have showed a decrease in risks associated with pesticides use. However, there are delays in placing plant protection products on the market, measures to promote low-pesticide pest management should be stepped up and further efforts should be made to ensure the implementation of Integrated Pest Management. Poland also has a very high rates of non-communicable diseases due to dietary risk factors and efforts are needed to support the shift to a more healthy sustainable diets in line with national recommendations.

1.4 Foster and share knowledge, innovation and digitalisation in agriculture and rural areas

The agricultural knowledge and innovation system (AKIS) in Poland is strong and relatively well integrated. It has great potential to create and disseminate knowledge for agriculture and related rural activities (environment, climate, biodiversity, food and non-food systems including processing and distribution chains, consumers and citizens, etc.).

A wide range of training and advisory services are available to all stakeholders. Further involvement and integration of public and private advisors within the AKIS is however needed. Cooperation between advisors could be improved by addressing the fragmentation of advisors, and by improving the motivation, skills and openness to new subjects and types of advice. Advisory services need to be diversified and tailored to small farmers business development needs and to new production systems. The European Innovation Partnership could be further strengthened and diversified.

Poland uses mostly traditional digital infrastructure and technologies in agriculture. Poland ranked 23rd out of 28 EU Member States in the Digital Economy and Society Index (DESI) 2020. However, steady digital growth in terms of connectivity, human capital, use of internet services, integration of digital technology and digital public services is taking place.

1.5 Recommendations

To address the above interconnected economic, environmental/climate and social challenges- the Commission considers that the Polish CAP Strategic Plan needs to focus its priorities and concentrate its interventions on the following points, while adequately taking into account the high territorial diversity of the Polish agriculture and rural areas:

Foster a smart, resilient and diversified agricultural sector ensuring food security

- **Achieving increased competitiveness and productivity** of the agrifood sector **through support for investments and financial instruments**, taking accounts of actual needs, development potential and challenges related to enhanced sustainability.
- **Improving the viability of farms through ensuring a fairer and better targeting of income support** by reducing income gaps between different farm sizes (in particular in favour of smaller-sized farms) and territories of the country by applying, for example, the complementary redistributive income support for sustainability and the reduction of payments.
- **Rebalancing the power in the food supply chain**, by targeting support schemes aimed at increasing the level of organisation of farmers and at stimulating consolidation and recognition of different types of producer organisations and cooperatives, specifically in the fruit and vegetables and pig sectors. Also, local small and medium size processors are important players to strengthen the position of farmers and to balance bargaining power in the supply chain. Support schemes should also be used to encourage farmers to develop and participate in short supply chains, and in the production of high value added products, to attract and educate consumers in that regard.

Bolster environmental care and climate action and to contribute to the environmental- and climate-related objectives of the Union

- **Continuing efforts to reduce net emissions from agriculture** by focusing on reducing emissions related to fertilizer use on soils and avoiding carbon release from organic soils, including peatlands, and on better livestock management (ruminants), especially by adapting feeding strategies so that to reduce emissions from enteric fermentation in line with the EU Methane Strategy. The role of forest in carbon removal must also be improved through sustainable forest management (e.g. changes in management intensity, hardwood/softwood species mix), enhanced multifunctionality, a greater reliance on agro-forestry, afforestation and improved forest resilience to climate change. The latter cannot be achieved without safeguarding forest biodiversity through protection and restoration of its valuable habitats. Where relevant, carbon farming approaches should be pursued.

- **Improving energy efficiency** by reducing energy consumption in agriculture and forestry. In parallel, Poland should step up efforts to **increase production of energy** on-farm through anaerobic fermentation thus using farming by-products such as manure more efficiently.
- **Contributing to the EU Green Deal target on high diversity landscape features**, to halt and reverse biodiversity decline in agriculture-related habitats, in particular in grassland habitats, as well as to prevent erosion. Efforts must be directed at not only maintaining existing landscape features but also establishing and adequately managing new features, while focusing on areas with limited presence of landscape features, in view of better connecting agricultural habitats and restoring and maintaining their favourable conservation status in accordance with the Prioritized Action Framework (PAF). This is also expected to provide benefits in form of enhanced pollination, natural pest control and climate adaptation.
- **Reducing water scarcity** by significantly stepping up support for nature-based solutions, appropriate land management practices improving soil water retention such as longer and more diverse crop rotation, and crop adaptation through promoting drought-resilient, less water intensive and improved crops varieties better managing crop-water demand. Support should also focus on irrigation systems best performing in terms of water savings, and on water re-use in line with the Water Framework Directive requirements.
- **Contributing to the EU Green Deal target to reduce nutrient losses** by supporting better nutrient management from animal housing to fertilisation techniques, more widespread application of precision farming, improved manure management, setting relevant landscape elements like riparian buffer strips or wetlands, and other technologies, including digital farm nutrient management tools, geared to using inputs more efficiently and decrease nutrient surpluses.
- **Contributing to the EU Green Deal target on organic area**, by significantly stepping up efforts to halt the decrease and stimulate an increase in the area under organic farming in Poland through CAP support for both conversion and maintenance. In parallel, efforts and investments to enhance the demand for organic products in the food supply chain must be stepped up e.g. through identifying the potential in local organic food production, creating appropriate food chain structures and disseminating innovative approaches.

Strengthen the socio-economic fabric of rural areas and address societal demands

- **Promoting employment, growth, social inclusion and local development in rural areas**, by addressing the age unbalance in rural areas and in the agriculture sector through investments targeted to attract young people, to ensure basic services to the population in rural areas, and to foster rural business start-ups and develop the bioeconomy. In doing so it will be important to ensure synergies and complementarities among the EU and national funds.
- **Contribute to the achievement of the EU Green Deal target on antimicrobials** by putting in place sizeable efforts to significantly reduce the use of antimicrobials in farming, considering that the figures indicate sales of antimicrobials above the EU average. Poland is encouraged to use all available tools, including instruments under the CAP, to support the farmers e.g. by

promoting best practices on reduced and prudent use of antimicrobials, together with improved livestock management, biosecurity, infection prevention and control.

- **Improve animal welfare**, especially for pigs and laying hens, through support for ambitious measures to improve livestock management practices, infection prevention and control, including enhanced biosecurity.
- **Contribute to the EU Green Deal targets on pesticides, in particular** by promoting a reduction in the use of more hazardous pesticides and ensuring the uptake of integrated pest management practices.

Fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake

- **Contribute to the EU Green Deal target on broadband by** further developing broadband networks to help overcome connectivity gaps in the rural and remote areas. In parallel, invest in digital skills development. In doing so it will be important to ensure synergies and complementarities among the EU and national funds.
- **Invest in a well developed AKIS and further integration of information, knowledge, advice, innovation and digital skills**, by supporting better links between public and private advisors and investing in their training and skills. Advisory services should be prepared to respond to the growing information needs of farms (including small farms) regarding economic, environmental as well as social aspects, and able to provide innovation support.

2. ANALYSIS OF AGRICULTURE AND RURAL DEVELOPMENT IN POLAND

Agriculture in Poland has always been an important part of the country's economy. In most areas, soil and climatic conditions have favored a mixed type of farming. However, climate change increasingly puts agriculture at risk and forces adaptation, for example to ensure water availability. In spite of the fact that very large farm holdings exist in parts of Poland, agriculture continues to have a fragmented structure, with a dominant share of small and medium-sized family farms.

Rural areas in Poland are diverse and face quite different socio-economic conditions. They host about 35% of the national population and create around a quarter of the national gross domestic product (GDP).

2.1 Support viable farm income and resilience across the EU territory to enhance food security

In Poland, agricultural entrepreneurial income is about 53% of the average wage in the whole economy over a period from 2005 to 2018¹ (higher than the EU average, which is 49%). The Polish share ranged from 36% in 2005 to 67% in 2017.

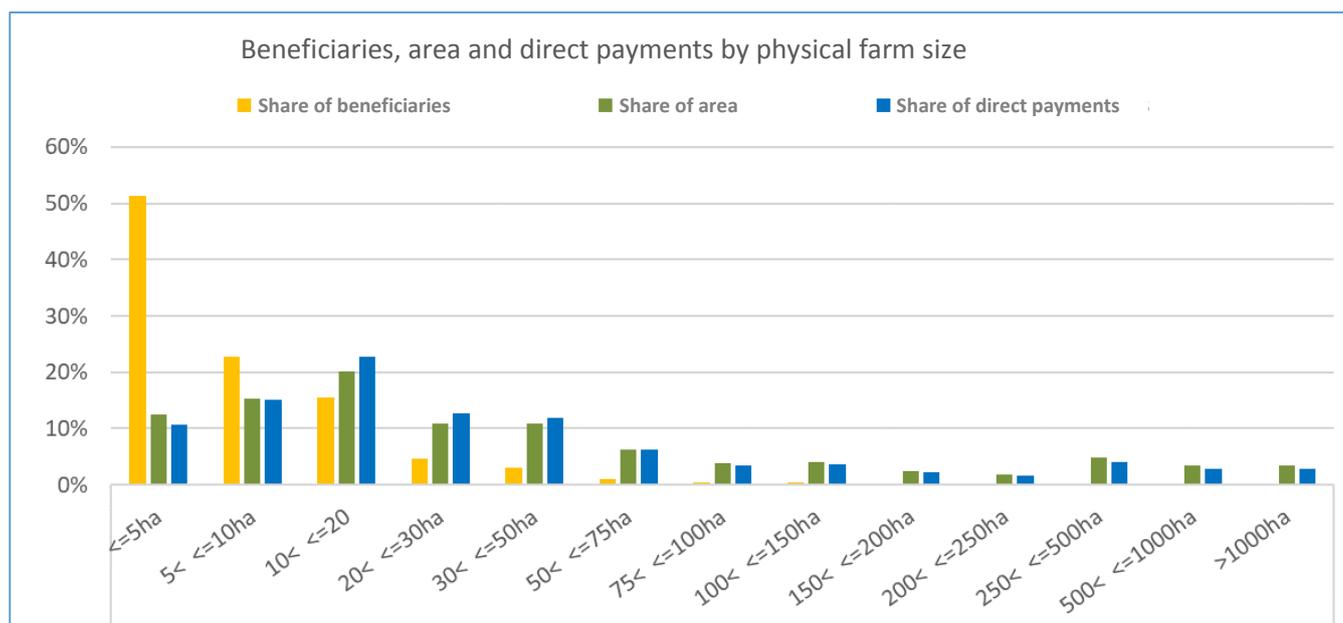
The average factor income is only about a third of the EU average over the same period (around EUR 7 000 in last years), but this ratio has been increasing over the years². On average, Direct Payments (DP) form about 29% of the factor income in 2018 for the entire farming population. Considering only the professional farms in the Farm Accountancy Data Network (which is closer to the actual figure of direct payment beneficiaries), direct payments account for 40% of agricultural factor income. Payments under the rural development programme (excluding investment support) cover an additional 6%³. This support thus remains low in comparison to direct payments, but is important in some areas, for example grazing livestock. In 2017, 20% of the beneficiaries farmed 66% of the land and received 70% of direct payments⁴.

Agricultural factor income per worker has large differences between different farm sizes, agricultural sectors and regions⁵. It increases with farm physical size up to 200 hectares, but then declines beyond 500 hectares. Meanwhile, the level of direct payments per hectare increases up to 30 hectares and then decreases. This is a result of the redistributive payment. However, the differentiation of direct payment per hectare is still relatively low⁶ and there are still important differences in income by working unit between small to medium farms on one hand, and large farms on the other hand. Income by working unit tends to be higher for the largest economic farm sizes. Among a total of 1.4 million farms in Poland, 1.3 million are beneficiaries of direct payments⁷. Income by working unit is the highest for the granivores and dairy sectors. Most sectors see fluctuations in income over time (in particular in cereals) except granivores encountering a significant and steady increase. However, this is due to stable and strong improvement of incomes of poultry farm compensating fluctuations of pig farm incomes⁸. The income by working unit is much lower in mountain Areas facing Natural Constraints (ANC) (nearly 4 000 EUR) compared to other areas (over 6 000 EUR) whereas the total support per hectare is higher in mountain⁹.

Finally, among Polish regions, differences are also important such as the average factor income in south-eastern parts of Poland, which is about a third of the average in north-western parts of Poland¹⁰. It is worth mentioning that there are historical differences between regions in Poland that existed long before Poland entered the European Union

and applied the Common Agricultural Policy and that explain income levels. Larger former state farms in the north-west are on average more successful in terms of income, thanks to knowledge and money of new owners, as well as economies of scale.

Among other reasons, due to dependency on exports (see analysis in paragraph 2.2) and climatic risks (low level of precipitation and groundwater in Poland, see analysis in paragraphs 2.4 and 2.5), farm incomes strongly fluctuate. This leads to the need to deploy risk management instruments and strategies. In Poland, farmers receiving direct payments are obliged to insure at least half of their utilised agricultural area. Yet, since the scheme was introduced in 2005, only about 24 % of the utilised agricultural area is under crop insurance (and about 11 % of the Polish farms)¹¹.



Source: CATS control data, claim year 2017

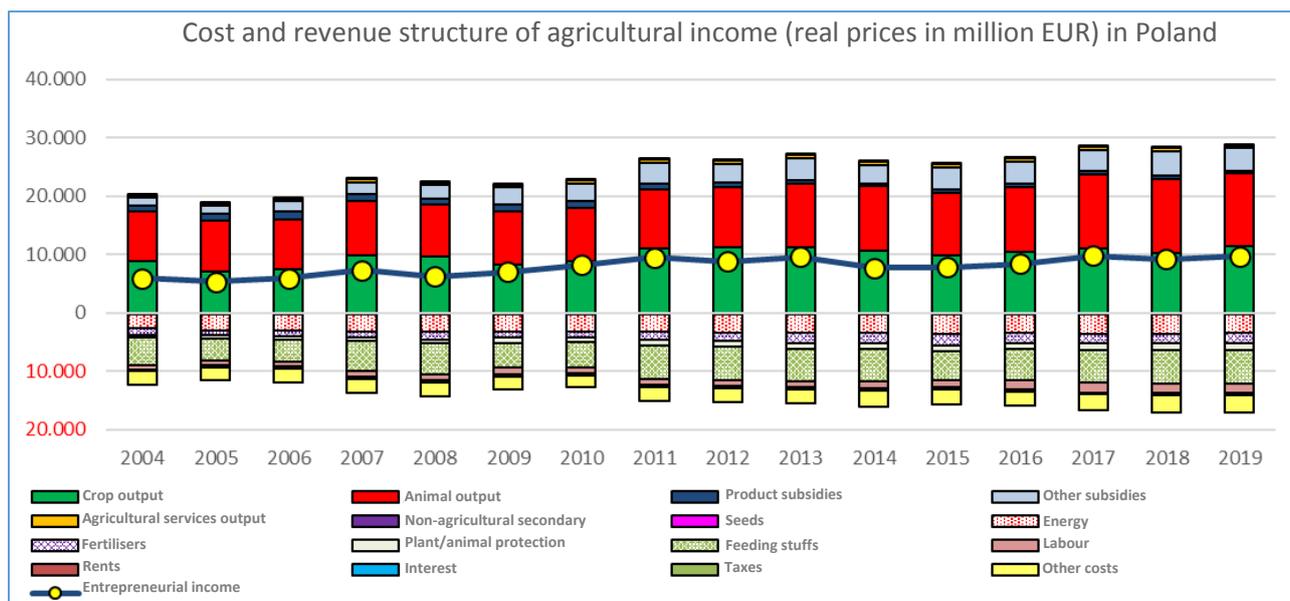
2.2 Enhance market orientation and increase competitiveness including greater focus on research, technology and digitalisation

The total share of agriculture, forestry and fisheries in Polish Gross Value Added is 3.2 % and this is twice as high as the EU average¹². Poland has a positive trade balance with countries outside the EU and in trade between Poland and other EU Member States and it is increasing over time. Between 2003 and 2018, exports increased from EUR 4.1 billion to EUR 29.7 billion and imports from EUR 3.6 billion to EUR 20 billion. The main export product to non-EU countries are beverages and processed products.

The total factor productivity (TFP) is increasing in Poland. Productivity is increasing in all dimensions (labour, land and capital). Labour productivity in Poland increases mainly due to the outflow of labour (-27% between 2005 and 2017). Cost competitiveness in Poland is determined, notably, by lower labour costs and low margins along the food chain compared to EU-15 countries but also by investments to modernize the sector¹³.

The total number of farms decreased between 2005 and 2016 from about 2.5 million to 1.4 million farms¹⁴. The average farm size has increased from 6 to 10 hectares in the same time period. However, farms below 5 ha are still the largest group (52 %) of agricultural holdings¹⁵. In addition, the agricultural area declined in the same time from 15.9 million hectares in 2005 to 14.4 million hectares in 2016. The decline is mainly

caused by a decline in arable land. Livestock numbers are declining, between 2007 and 2016 from about 10.6 million to 9.4 million livestock units (LU). The livestock density (calculated as total number of livestock units/total utilised agricultural area) has remained relatively stable at around 0.66 LU/ha. The agricultural area of extensive grazing (area under grazing livestock production below 1 LU/ha of forage area) increased between 2005 and 2013 from 10% to 12% of the total UAA¹⁶. The integration of the Polish economy into European and international markets led to trade, capital and knowledge flows that increased the transfer of innovation to the agri-food sector. However, the overall level of innovation in agriculture is still quite low (small share of certified seed, small share of digital and precision farming) as well as low investment efforts in research and development.



Source: EUROSTAT. [[aact_eaa01](#)]

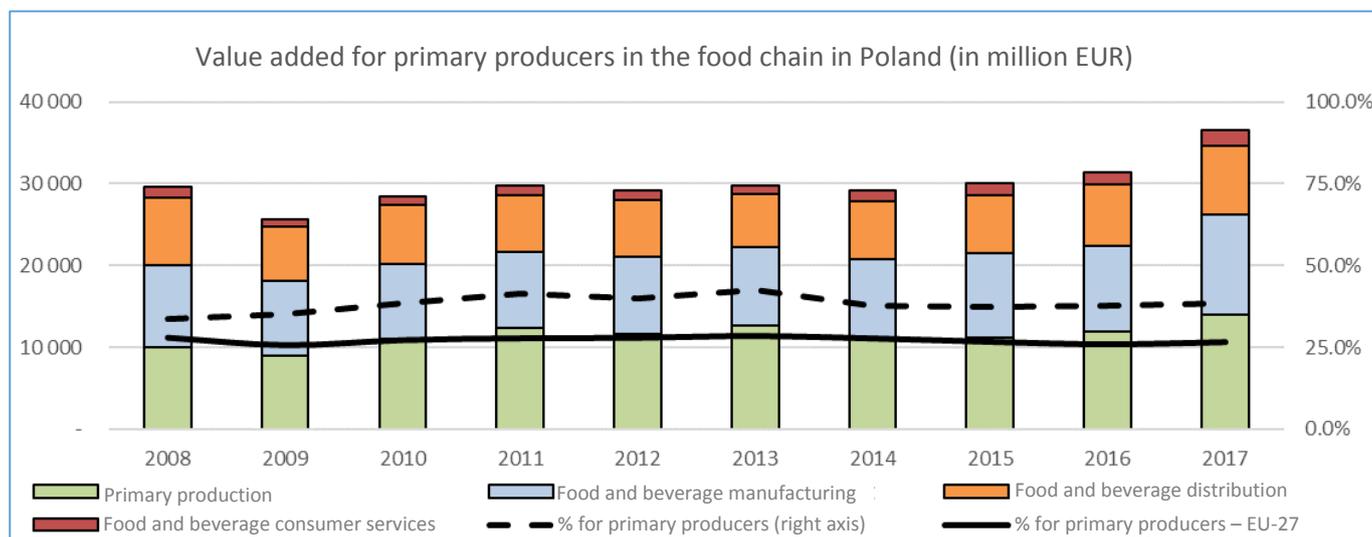
2.3 Improve farmers' position in the value chain

Milk, cereals, pigs, poultry and vegetables & horticulture production are the most important sectors in terms of production value in Poland in 2017. Poland produces more than 10% of the EU production in value of pig, poultry and eggs in 2017¹⁷.

The position of farmers in the supply chain (expressed in share of the value added) slightly increased between 2008 and 2013. However, this changed after 2013 and the share of farmers has decreased since. Nevertheless, the share of the value added that goes to farmers at 37.9% in 2016 is still higher in Poland than the EU-average, though this does not translate directly into a stronger position of Polish farmers in the food chain. This is caused by specific structure of Polish food market – a huge proportion of farm products are not or little transformed. One of the possible ways to strengthen the position of farmers is to shorten the supply chains. This offers in particular opportunities for small farms and for farms producing quality products. Such short supply chains are, at present, little developed in Poland. Among others, this is linked to the relatively recent introduction of a legal framework in this area¹⁸ as well as little (but growing) knowledge and appreciation of this form of selling by both farmers and consumers¹⁹. Another possibility to add value is to use EU quality schemes by developing and marketing products with geographical indications.

In Poland, the number of recognised Producer Organisations (POs) equals 287 (in 2017), only 8% of the overall EU number of POs. At the end of 2017, about 250 POs fruit and vegetable were registered in Poland, associating approximately 7,000 growers; however, very few implement EU-funded operational programmes²⁰. Comparing this number to the total number fruit and vegetable growers²¹ (around 253 000), only around 3% of fruit and vegetable producers were members of recognised POs in 2017, which is low for these - often perishable - products. In addition, Poland, the biggest apple producing Member State in the EU (on average 30% of EU production) faces a structural overproduction, aggravated by the 2014 Russian embargo (loss of an important market for the “Idared” variety (20 % of Polish production))²².

The very low level of membership in the different types of producer organisations, cooperatives, inter branch organisations and other groupings is still highly influenced by the history (forced collective state owned farms). Nevertheless, the bottom-up cooperative initiatives would be helpful for farmers in gaining the position in the value chain leading also to more efficient management of supply and reduce food loss and waste.



Source: EUROSTAT

2.4 Contribute to climate change mitigation and adaptation, as well as sustainable energy

The share of agriculture, including croplands and grasslands, in the total net GHG emissions has been relatively stable in the period 1990-2018 reaching around 8% in 2018 and remains below EU average (13%)²³.

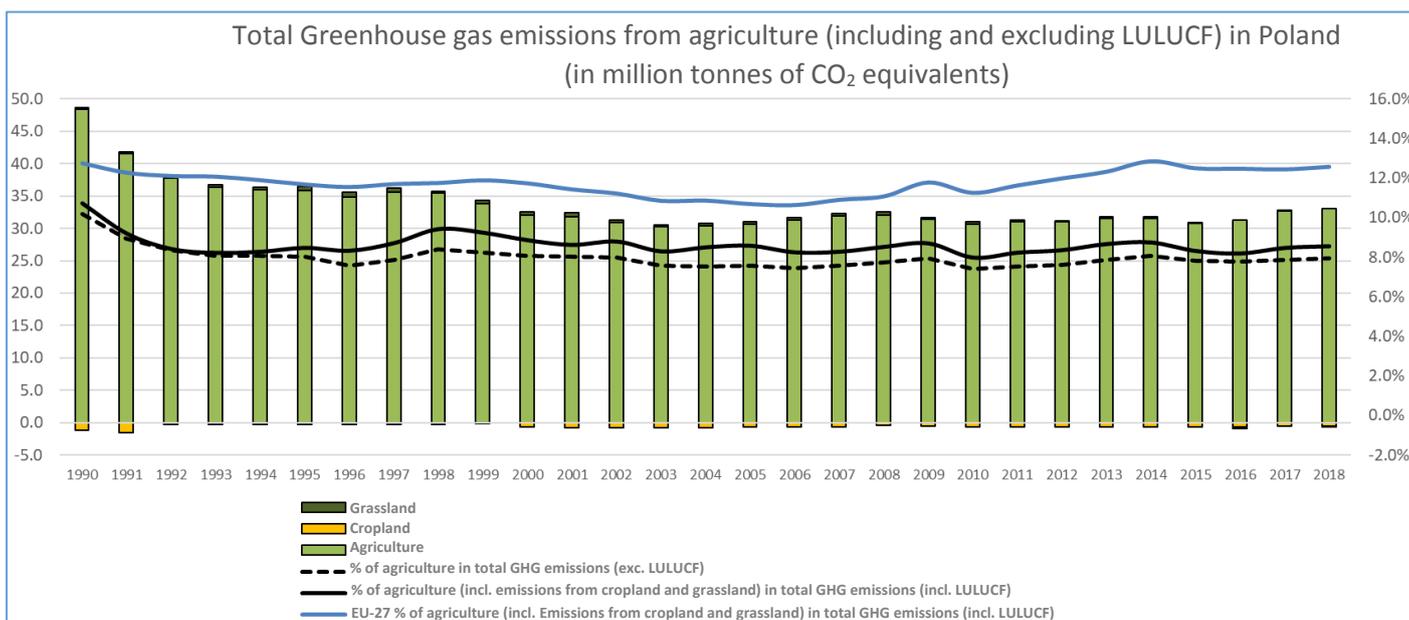
Nonetheless, Poland’s non-CO2 emissions from agriculture amounting to 33.1 million tonnes of CO2 equivalents (2018) is the fourth highest in the EU, contributing slightly more than 8% to all EU non-CO2 emissions from agriculture²⁴.

When compared with data from 1990, Poland shows a higher decrease in non-CO2 GHG emissions from agriculture than the average for EU: in 2018 GHG emissions from agriculture were lower by 32% compared to the reduction rate of 21% for the EU. However, much of reductions took place before mid-2000s. Emissions from agriculture in the last years are increasing at a higher rate than the EU-27 average.

The three main agricultural sources of non CO2 GHG emissions in Poland in 2018 were: agricultural soil (46% of the emissions compared to 38% in the EU), enteric fermentation, mainly cattle (39% compared to 44% in the EU), and manure management (11% of the emissions compared to the EU's 14%). The values for the emissions from both enteric fermentation per livestock unit and from agricultural soil per ha are higher than the EU average, while emissions from manure management per livestock unit are lower. Emissions in all the three categories increased between 2013 and 2018²⁵.

The share of permanent grassland in UAA of 21-22% has been stable since 2000 and remains below EU average of 31%.²⁶ This share is some 19% for areas under the direct payment system²⁷. Poland's coverage with forest area is 31% of the territory, below the EU average (40%, 45% if other wooded land is included)²⁸. Peatlands cover 9.6% of soils in Poland²⁹. According to estimates, significant reductions of agricultural greenhouse emissions could be obtained through rewetting of such agricultural land.³⁰

Concerning the Land Use, Land Use Change and Forestry (LULUCF) sector, in the period 1990-2018 the emission covered within scope of land use and forestry increased more significantly than the EU average: increase by +12.4% in Poland compared to 3.1% in the EU. However, LULUCF removals decreased by 15.6% between 2013 and 2018. The most significant sink - forest - increased removals by 7% over the same period although also experienced substantial inter-annual fluctuations; cropland emissions thus halved these removals while of grassland is close to a sink of CO2³¹.



Source: European Environmental Agency. As in EUROSTAT [[env air gge](#)]

Poland's per hectare figures for production of renewable energy from agriculture and forestry remain below the EU-average. Between 2013 and 2018 Poland experienced a decrease in production of several agricultural renewable sources. A significant increase in production of energy from anaerobic fermentation was observed, but there is great potential in terms of energy per livestock unit (0.37 Gigajoule/ha; EU: 3.93 Gigajoule/ha). While agriculture is responsible for almost 12% of all the renewable energy produced, the forestry sector contributes almost 70% of such energy³². Finally, the direct use of renewable energy in agriculture and forestry in Poland fluctuates around 15%.

Regarding energy use in agriculture and forestry, Poland is the EU country with the second highest share of agriculture and forestry in the total final energy consumption: 5.3%

compared to 2.7% for EU-28. Final energy consumption by agriculture and forestry per hectare of UAA is some 60% higher than EU average and has since 2013 increased by 8.5%³³.

Poland does not make use of the rural development funding to improve its energy efficiency, renewable energy production, or reduction of GHG emissions from livestock or agricultural land. Rural development support is used to contribute to one GHG emissions-relevant indicator: land under contracts contributing to carbon sequestration and conservation. The effort is rather small, covering 0.02% of the land under such contracts and all linked to afforestation activity³⁴. In the rural development programme 2014-2020, Poland set a target to afforest additional 4.800 ha of land.

In terms of climate adaptation, like other countries in the continental region of the EU, Poland faces changing weather patterns (wetter and warmer winters and hotter, drier summers), and increasing risk of soil erosion. This makes Poland's agriculture vulnerable to higher yield variability, increased heat stress for dairy cows, and risks of new and more pest and disease outbreaks or weeds due to higher temperatures and a longer growing season. In contrast, opportunities could come from new crops or varieties, the longer vegetation period's positive impact on grasslands and tuber crops and reduction of moisture loving pathogens³⁵. Increasing resilience to climate change by stepping up climate adaptation measures would entail relying in particular on the application of soil health enhancing practices, and appropriate management of woodland, forestry, floodplains (breaching or removing of embankments or set-back embankments), and drainage (blocking drainage ditches and tile drains).

Poland's National Energy and Climate Plan (NECP)³⁶, independent of the current and planned policies and measures, projects by 2040 an increase by some 5% of agricultural emissions and a further reduction by half of LULUCF removals. In particular, while in both cases the emissions from enteric fermentation are expected to decrease, emissions from soil and manure would increase, the latter substantially. The NECP does not specifically provide for peatlands/wetlands despite these being significant in area in Poland.

Maintaining and if possible increasing forest areas is one of the objectives referred to in the NECP, which also foresees the progress in sustainable forestry management through increasing the part of forest area, from the current 96% to 99%, with forest management plans.

The NECP has set a target of 21-23% renewable energy sources' share in energy consumption in 2030, conditioning the 23% target on additional EU funds, including for a just transition.

2.5 Foster sustainable development and efficient management of natural resources such as water, soil and air

Ammonia (NH₃) emissions from agriculture in Poland decreased from 340 ktonnes in 1995 to 304 ktonnes in 2005 and 260 ktonnes in 2016. However, emissions have been on the upward trend since 2015 reaching almost 299 ktonnes in 2018³⁷. As the contributions of other sectors (waste and transport) to the overall NH₃ emissions decrease, the part of agricultural sector in the overall NH₃ emissions proportionally increases. In 2018, agriculture was responsible for 94 % of all NH₃ emissions in Poland (EU-28: 93%). Livestock is responsible for 76% (EU-28: 73%) of all agriculture-related NH₃ emissions while crops for the remaining 24% (EU-28: 23%). A substantial part of the NH₃ emissions

in Poland agriculture comes from the use of inorganic fertilisers (21.5%), dairy cattle sector (12%), pork sector (10.4%), and non-dairy cattle sector (7.5%). Despite the reductions achieved to date, according to Commission assessment³⁸, Poland is considered to be at high-risk of non-compliance with the ammonia reduction commitments established by the NEC Directive (1% for any year for 2020-2029 and 17% for any year from 2030 against the 2005 baseline).

The state of soil in Poland raises some challenges for agriculture³⁹. The quality of the soil expressed in terms of content of organic carbon is rather low considering that the mean organic carbon content figure is 21.9 g per kg of soil compared to the EU-28 average of 43.1g/kg.⁴⁰ On the other hand, peatland share is close to 10% (9.7%)⁴¹ (see also point 2.4). Poland does not suffer from a pronounced problem with erosion: 1.4% of agricultural area is affected by moderate to severe water erosion (EU-27: 7.0%) while losing about 1 tonne of soil per hectare annually compared to EU-27: 2.5 tonnes⁴². The highest level of soil loss is observed in the southern mountainous fringes of the country. However, in 2016, 95%⁴³ of tillable area was under conventional tillage, and 45%⁴⁴ of arable land was left without soil cover during the winter months. More sustainable management practices would be beneficial to improve soil quality and decrease surface run-off.

In 2017, 14%⁴⁵ of Poland agricultural land was under rural development contracts to improve soil management.

With regard to the issue of water pollution by nitrates, 4% of the ground water stations in Poland in 2012 were of poor quality, 8% of moderate quality and the remaining 88% of high quality. Data for 2017 shows that while the poor quality waters decreased to 2%, the moderate increased to 15%, bringing the high quality waters to 83%. Notwithstanding, the figures remain significantly more positive than several other Member States for which data is available⁴⁶.

The nitrogen surplus in Poland increased in the period 1995-2017 from 33 to 48 kg/N/ha/year and since mid-2010s has remained similar to the EU average: the 4-year average for Poland has reached 45kg N/ha/year compared to the EU-27 46.5 kg N/ha/year⁴⁷. While the phosphorus surplus increased between 1995 and 2006, since 2006 there is the downward trend with the surplus of 1 kg/P/ha/year in 2016 and in 2017, though it is above EU average (0.5 kg P/ha/year)⁴⁸.

Poland is one of the Member States where the use of nitrogen and phosphorous originating from animal manure decreased in 2012-2014 by more than 5% compared to 2008-2011⁴⁹. Polish agriculture is also characterized by a rather low livestock density per ha: 0.66 LU/ha (the 13th highest density in the EU-27⁵⁰).

However, these indicators may change if the ongoing intensification of farming practices leads to overexploitation of natural resources, decreasing their quality. In case of water, surpluses of nitrogen and phosphorus from the use of animal manure may lead to polluting ground and surface waters and increase the eutrophication of Baltic Sea. The latter remains a major environmental problem and Poland is the main contributor of nutrient inputs of agricultural origin⁵¹.

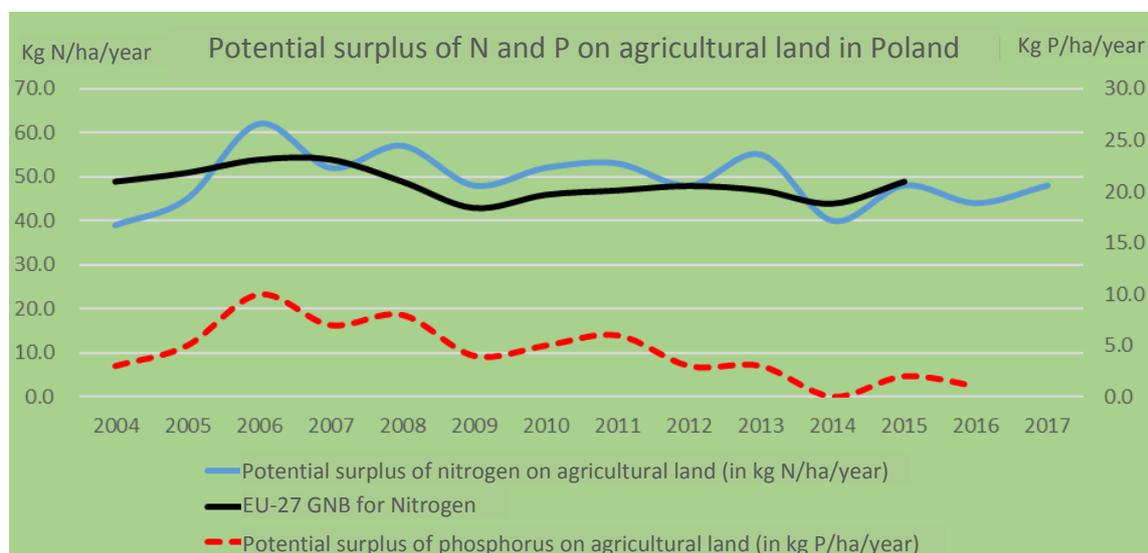
In terms of the Water Framework Directive (WFD) approximately 70% of surface waters are in less than good ecological status and around 26% were failing to achieve good chemical status. For groundwater bodies around 8% were failing to achieve good

chemical status and 7% were failing to achieve good quantitative status. Diffuse agricultural pollution is one of the pressures contributing to this situation⁵².

Poland has one of the lowest (the fourth lowest) renewable freshwater resources per 1000 habitats in the EU: 1.6 million m³ (annual average).⁵³ The important water deficit is due to low precipitation levels in the central regions as well as due to high evaporation. Compared to the level of precipitation, Poland loses 73% due to evapotranspiration⁵⁴, especially in the growing season. Relatively low water resources and negative water balances indicate problems with the water retention capacity. However, while straw based manure could affect water retention of soil, its availability depends on the type of livestock husbandry systems.

The share of irrigated area in the total is very limited, in 2016 it reached 0.92% (increase from 0.32% in 2013) of the utilised agricultural area⁵⁵. However, between 2010 and 2016 the share of irrigated area in Poland increased by 191%, the second highest augmentation in the EU⁵⁶. Irrigation in agriculture represents 0.8% of the total water abstraction⁵⁷.

In 2017, 10% of Poland’s agricultural land was under rural development contracts to improve water management⁵⁸.



Source: EUROSTAT [aei_pr_gnb]

2.6 Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes

The farmland bird index decreased from 88.5 in 2009 to 80 in 2017 in Poland and is slightly below the EU-27 index for 2017: 82.5⁵⁹.

The status of valuable habitats protected under Habitats Directive is expressed in an indicator on “conservation status of agricultural habitats” (grassland). In Poland, based on data for 2013-2018, 45% of grassland habitats were in unfavourable-inadequate status, 40% in unfavourable- bad, and only 15% is in favourable conservation status (which is below the EU-27 average)⁶⁰. According to the reporting on the conservation status and trends of species and habitats under the EU Habitats Directive, agriculture was identified as the main and first pressure and threat (47% and 49% respectively affected by agriculture) for species and as the fifth pressure and threat in case of habitats (29% and 24% respectively affected by agriculture)⁶¹.

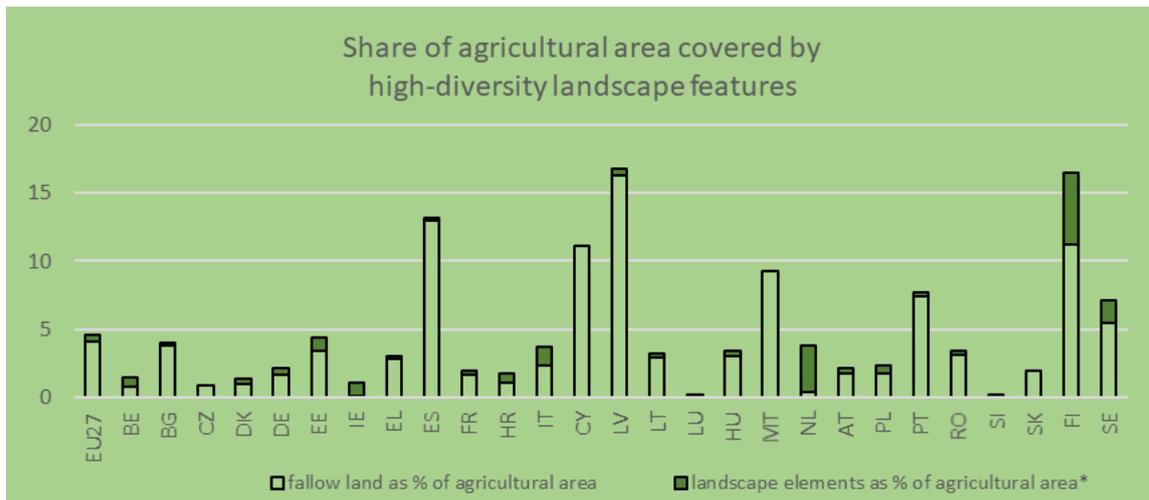
Intensification of farming management, land abandonment, pollution, modifications in hydrological systems such as drainage and expansion of invasive species are main agriculture-related threats responsible for the worsening of biodiversity status.

Polish agricultural landscape is characterised by substantial regional differences. As far as landscape features' density is concerned, in Poland, the average number of linear landscape elements is similar to the EU average with a higher average number in the southeast than in the north and northwest. However, fallow land occupies much smaller area of the agricultural land in Poland compared to the EU average (1.7% of UAA and 4.1% respectively)⁶². The density of hedges in Poland is very diverse depending on a region. In majority of the country it is either between 0.3-0.5 (8 regions) or 0.5- and 0.7 (6 regions)⁶³. Based on the 2012 Lucas survey, which established the EU-27 landscape diversity index at 0.7, Poland has a large variation in landscape diversity and landscape features' density. Only 4 regions scored below the EU average. The variation in landscape diversity for Poland was between 0.6-0.8 (with only 5 other Member States having a higher variation)⁶⁴.

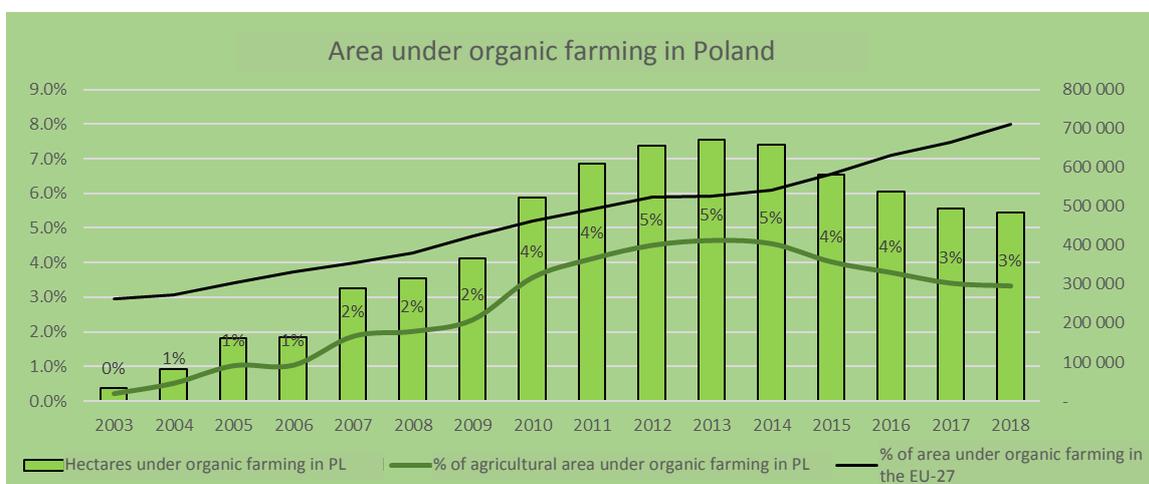
Poland activated three landscape features in the context of rules on conditionality linked to EU support, which guarantee a way of maintaining them: ponds, ditches and isolated trees. Under 'green' EU direct support, Poland activated a broad range of productive and non-productive areas/features that could count for the purpose of Ecological Focus Area obligation, however in terms of uptake, landscape features represent some 0.08% of arable land under obligation (EU: 0.23%, 2019). This limited number should be considered in the light of the continuing regionalised concentration of production. Creation of large-area farms specialised in few crops risks further decreasing the landscape diversity through removing the landscape features, which negatively impacts biodiversity.

In 2017, there was almost the same proportion of land managed by farms with low and high input intensity per ha: 33.5% against 32.4% respectively with the figures showing a stability in the trend over the last years. These figures slightly differ from the EU-27 averages: 36% for high input and 27% for low input intensity⁶⁵. The size of the agricultural area covered by high nature value farming in 2012 was below the average for the EU-28 at 22.7% of the Polish agricultural area, compared to 32.3% for the EU-28⁶⁶.

Poland's network of NATURA 2000 sites accounts for almost 20% (19.6%) of its territory, which is slightly above the EU average (18%). These sites include 35% of Poland forest area and 11% of agricultural area (averages for the EU are 30% and 11% respectively). To improve biodiversity, only 9% of land is under contracts to improve biodiversity and/or landscapes in Poland in 2017 compared with 15% for the entire EU⁶⁷. The total area under organic farming in Poland shows a regular downward trend since 2013 with a particularly quick drop since 2015. In 2018, organic farming covered close to 485 000 ha which represents 3.3% of the total utilised agricultural area. This was well below the increasing share of agricultural land under organic farming in the EU-27 (8%). A small increase of the area under conversion to organic farming can be noted in the last years which however has to be seen in the context of a parallel decrease of the certified area⁶⁸.



Source: EUROSTAT [org_cropar_h1 and org_cropar]



Source: DG AGRI based on Eurostat and JRC based on LUCAS survey.

* Linear elements considered here: Grass margins, shrub margins, single trees bushes, lines of trees, hedges and ditches. This estimation is to be taken with caution because of methodological caveats.

2.7 Attract young farmers and facilitate business development in rural areas

Poland has the third highest share of young farmers in the total number of farm managers (10.2% compared to EU average of 5.1%). However, similar to the EU-trend, the share of young farm managers has decreased between 2010 and 2016. Since 2010, the share of young farmers in the total farming population has decreased by over 1%⁶⁹. The ratio of young managers to elderly is the second EU highest (0.27 compared to EU average of 0.09)⁷⁰.

The ratio of young female to male managers is about 3:8, which is also one of the higher ratios in Europe. The share of farm managers below 35 years of age with at least a basic level of agricultural training (41% in 2016) is lower than the average (44%) for Polish farmers, but close to the EU average⁷¹.

Since 2014, farm managers under 35 years have an agricultural income comparable to the average⁷² even though the average economic farm size in Poland is the highest in the age class of 25 to 34 years old. It is complex for young farmers and newcomers to set up because there are constraints on farm succession and access to land⁷³: despite relatively high availability of land, it is not always fit for business development as land is very fragmented.

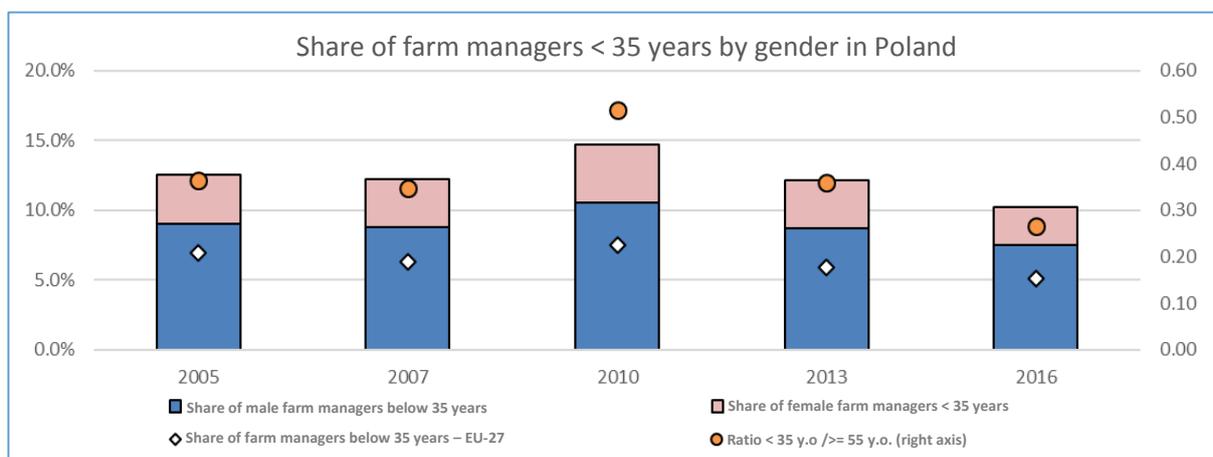
Farmers in Poland are younger than the EU 27 average and this generates a particular need for finance and technical support. Around 50-70% of the total financing gap (estimated to be between EUR 3.0 billion and EUR 6.2 billion) relates to young farmers. This is mainly attributable to their lack of access to finance due to their lack of collateral, lack of credit history and their little experience in farming and farm management. Beyond these difficulties, agricultural sector attractiveness is also challenged by perceived better conditions in other sectors in rural areas⁷⁴.

In terms of CAP support for young farmers, Poland spent 63.4 MEUR, or 1.9% of its direct payments on the young farmer payment in 2018. Under its rural development programme 2014-2020, an envelope of 718 MEUR (5.3 % of the total budget) has been allocated to provide support for the installation of young farmers.

Evidence suggests these CAP aids have a positive impact upon generational renewal in agriculture, supporting incomes, performance and employment, but especially when combined with advisory and technical assessment support.

Availability of land, cost of land, as well as weaknesses in the advisory and technical assessment support in preparing aid applications, hamper the success of these aid schemes, especially for small farms⁷⁵.

An increase in the development of small and medium sized farms is observed in rural areas but there are regional disparities. The highest growth occurs in areas near to cities and it is also much higher in the Western part of the country than in the eastern regions. To support this development, attractiveness of rural areas and improved infrastructures are keys (road, internet access etc.): In 2016, 81 174 businesses were created in rural areas⁷⁶.



Source: EUROSTAT

2.8 Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry

More than a half of Poland's territory (54%) is predominantly rural⁷⁷. Considering together with intermediate regions, it added up to 95% of Poland territory as non-urban areas. Comparing these percentages to the EU-27 ones (44% and 89% respectively), it shows Poland's areas as more rural on average⁷⁸.

In 2019, 35.8% of population was living in predominately rural areas (compared to EU-27 average of 20.8%)⁷⁹. While the rural population is only slightly shrinking (-1% since

2015) there is an important ageing issue, the ageing group above 65 years has increased by 13% since 2015. As regards the rural population density, a little decline (from 86 to 84 inhabitants per km² in 2013 and 2016, respectively) is observed⁸⁰.

Small farms contribute to access to food for their households and communities diversifying significantly regional availability⁸¹.

Employment rate in rural areas is 66% of the population. It is slightly lower when comparing to town & suburbs (67%) and lower with cities (72%). It is also lower to the employment rate of rural areas in the EU27 (68%). The male-female rate is 74% and 56% respectively, with the positive trend over the last decade for both genders⁸².

The total unemployment rate equals to 3.9%, whereas in rural areas is 4.3%. It is lower than EU-27 where they equal to 7.3% and 6.3%, respectively. When comparing the youth unemployment rate in rural areas, in Poland (12.8%) it is lower than in the EU-27 (14.6%)⁸³.

In rural areas, there is a visible and constant decrease (from 15.3% in 2013, to 9.6% in 2019) of young people (aged 15-24) who are neither in employment, nor in education/training.

The share of women in agricultural labour force decreased from 45.1% in 2013 to 39.1% in 2016. The share of women farmers is 29%, slightly above the EU average⁸⁴.

The GDP per capita in purchasing power standard compared to EU-27 average in rural areas is stable over the recent years being around 50%. As regards tourism infrastructure in rural areas, the situation is also stable over recent years (2014-2018) and is around 320 thousand bed places (which is more than 40% of total bed places in Poland)⁸⁵.

The poverty rate in rural areas is in constant decrease, being around 50% in 2005 and down to 25% of the population in 2018 (as compared to EU-28 average of 23.5%)⁸⁶. There is no gap in terms of risk of poverty between the natives and the migrants.

Poland programmed about 10% of the RDP budget on basic services development in rural areas and slightly above the minimum spending was programmed on LEADER (5.7%). Currently, there are 291 Local Action Groups implementing the local development strategies on the territory of 2 234 rural communities inhabited by more than 20 million people⁸⁷. LAGs have at their disposal a rather low budget therefore can contribute only to a limited extent to rural areas' development.

The total forest area has been slightly increasing (by 1.4% over 2000-2012 period, compared to the EU-28 by 1.1%). It covers 31% of the total land area⁸⁸. In 2017, forestry sector employment equalled over 61,000 AWU, a considerable increase from 35 000 AWU in 2005. This equalled a share of 0.5% of total employment. Labour productivity in forestry equals 31 000 GVA per Annual Working Unit (AWU) which is below the EU average in 2017⁸⁹.

The turnover from the bioeconomy has increased from EUR 82.9 billion in 2009 to EUR 115.1 billion in 2015; the main contributing sectors being: Food, beverage and tobacco (51%), Agriculture (19%), Wood products and furniture (11%), while the Forestry accounted for 5%. The bioeconomy employment over the same period has been decreasing from 2.91 million persons to 2.62 million. The turnover per person employed in the agriculture bioeconomy is less than half of EU27 average (18 000 EUR and 45 000 EUR, respectively)⁹⁰.

2.9 Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, as well as animal welfare

Antimicrobial resistance (AMR) is linked to the excessive and inappropriate use of antimicrobials in human and animal healthcare. The sales of veterinary antimicrobial agents in Poland, expressed as milligram per population correction unit (mg/PCU), stayed well above the EU average in 2017 and 2018 (163.9 mg/PCU and 167.4 mg/PCU respectively⁹¹). The data from 2017 onwards is based on an improved data collection system. The Polish action plan on AMR covers human health aspects instead of pursuing a One Health approach.

In terms of animal welfare, one of the main issues in Poland is that the tail docking of pigs remains routine practice despite being forbidden by EU rules. Tails are usually docked to prevent pigs from stress-induced tail biting in response to negative environmental and management factors. The perseverance of this practice has been detected in most Member States audited by the Commission. In 2019 Poland informed the Commission about the efforts it was taking to reduce these occurrences. However, since 2018 Poland has not provided any detailed action plan or data that could indicate that the issue has been addressed. Furthermore, Poland, as a second EU producer of eggs, has more than 80% of its production under cage system compared to the average EU of around 50%. Biosecurity is also a challenge, considering that Poland is among the countries affected by African swine fever (ASF), where farms with low biosecurity and poor controls pose higher risk for animal disease infections and spread.

The sales of pesticides in Poland increased gradually between 2011 and 2017 with the majority of pesticides sold being ‘herbicides, haulm destructors and moss killers’ followed by ‘fungicides and bactericides’. In 2018 however, the increasing trend broke and the level of pesticides sold returned to a similar level as in 2014⁹². An upward trend in the sale volumes of PPPs per UAA is however, expected to continue⁹³.

The Harmonised Risk Indicator (HRI) 1, weighting the volume of pesticides placed on the market according to the actual risk of active ingredient, showed a downward trend in the period 2011/2013-2018 tracing the average EU dynamics⁹⁴. According to HRI 1, the use and risk linked to pesticides use reduced by 22% in the 2011-2018 period (EU: -17%). However, there has been an increase of risks associated with the use of more hazardous substances (candidates for substitution) since 2012. HRI2 values indicating emergency authorisations from 2016 onwards also importantly has showed an increasing trend compared to the 2011/2013 baseline⁹⁵.

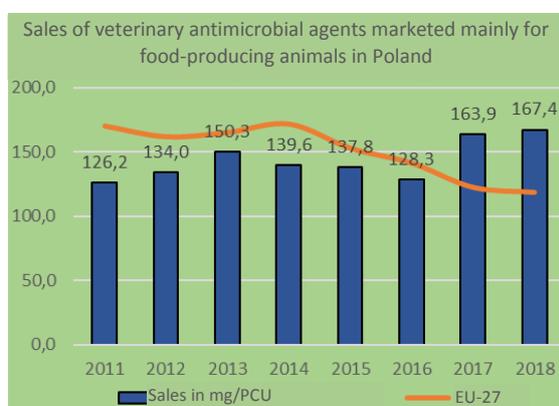
In terms of placing on the market of plant protection products, despite improvements, Poland’s delays in assessments for approval or renewal of active substances and authorisations of plant protection products remains a matter of concern.

As regards the implementation of the sustainable use of pesticides (SUD) directive, Poland submitted a revision of the National Action Plan covering years 2018-2022⁹⁶.

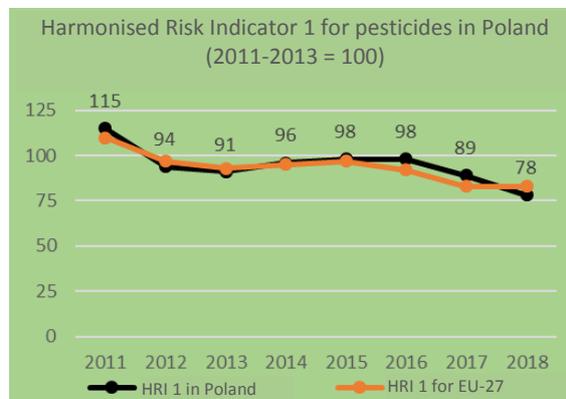
Poland has introduced some measures to promote low pesticide-input pest management and the general principles of the Integrated Pest Management. However, further efforts are necessary to ensure full implementation of the Integrated Pest Management by all professional pesticides’ users. Furthermore, the Commission 2017 overview report on the SUD directive indicated that just half of all used PPP packaging is collected and disposed of using a safe disposal system⁹⁷.

With regard to food loss and food waste in primary production and processing, no data is yet available and little attention is given to food loss and waste from primary production in the National Waste Prevention Programme⁹⁸.

On consumption trends, one third of the population in Poland indicates not to include fruit and vegetables in their daily diet (EU: 36%)⁹⁹. The proportion of obese persons in the population (almost 17%, 2017 data) is above EU average (15%). The share of overweight (56%) and pre-obese (39%) persons has been on an increase in the 2008-2017 period¹⁰⁰. Poland has a very high burden from non-communicable diseases due to dietary risk factors expressed as Disability Adjusted Life Year (DALYs) per 100 000 population attributable to diet¹⁰¹. This DALY value is influenced by a number of dietary factors. Efforts should focus on shifting towards healthy sustainable diets, in line with national recommendations, in order to contribute to reducing rates of overweight, obesity and the incidence of non-communicable diseases while simultaneously improving the overall environmental impact of the food system. This would include moving to a more plant based diet with less red meat and more fruits and vegetables, whole grains, legumes, nuts and seeds.



Source: DG AGRI after ESVAC, Tenth ESVAC Report (2020)



Source: EUROSTAT [aei_hri]

2.10 Cross-cutting objective on knowledge, innovation and digitalisation

Knowledge and innovation have a key role to play in helping the farmers and rural communities meet the challenges of today and tomorrow. A well-functioning AKIS should deliver knowledge flows between its actors responding to the growing information needs of farmers, to achieve the CAP objectives. AKIS covers not only “Agriculture” but also other rural activities related to the landscape, environment, climate, biodiversity, food and non-food systems.

There is untapped potential of the AKIS structure in Poland, characterised as strong and relatively well integrated, for better creation and dissemination of knowledge¹⁰². There is a wide range of training and advisory services available for farmers, offered by public advisory centres, agricultural chambers and private advisory companies.

Among them, decentralized public agricultural advisory is playing a dominant role. It is available for all farmers and implemented by 16 Regional Agricultural Advisory Centres (WODR) supported by the Agricultural Advisory Centre (CDR) in Brwinow. Since 2006, the number of full-time posts in provincial advisory centres has declined¹⁰³. There is too weak integration and cooperation between providers of advisory services and still a need to develop back office for all advisors. Advisory services need to be diversified and

tailored to the requirements of small farmers regarding business developments and new production systems¹⁰⁴.

Poland has a wide spread body of agricultural educational and research institutions. There are 10 agricultural research institutes supervised by the Ministry of Agriculture and Rural Development, 19 institutes of the Polish Academy of Sciences, which are part of the Faculty of Biological and Agricultural Sciences, 6 agricultural universities supervised by the Ministry of Education and Science and 54 (59 from 1 January 2021) agricultural schools supervised by the Ministry of Agriculture and Rural Development. There is also a growing involvement of researchers and agricultural advisors in implementation of interactive innovation projects. To link research with agricultural practice, the Polish rural development programme allocates 59 million EUR to 'cooperation' and eight groups under the European Innovation Partnership (EIP-AGRI) have been officially established out of the targeted 136 to be set up.

The EIP-AGRI Network in Poland is coordinated by the CDR in Brwinow. This set-up provides greater organisational potential and ensures the operational groups are anchored in a nationwide structure, with experienced and impartial staff and easier contacts with all stakeholders. Network implementation is mostly dependent on so-called 'innovation brokers' (4 brokers at national and 19 at regional level) experienced in working with farmers, rural entrepreneurs and researchers and on coordinators (administrative and supporting roles). Brokers play crucial role also in the promotion and supporting the creation of partnerships aiming at implementation of innovation projects.

The future national CAP network can play a much bigger role in promoting synergies between the CAP and European Research Area (ERA).

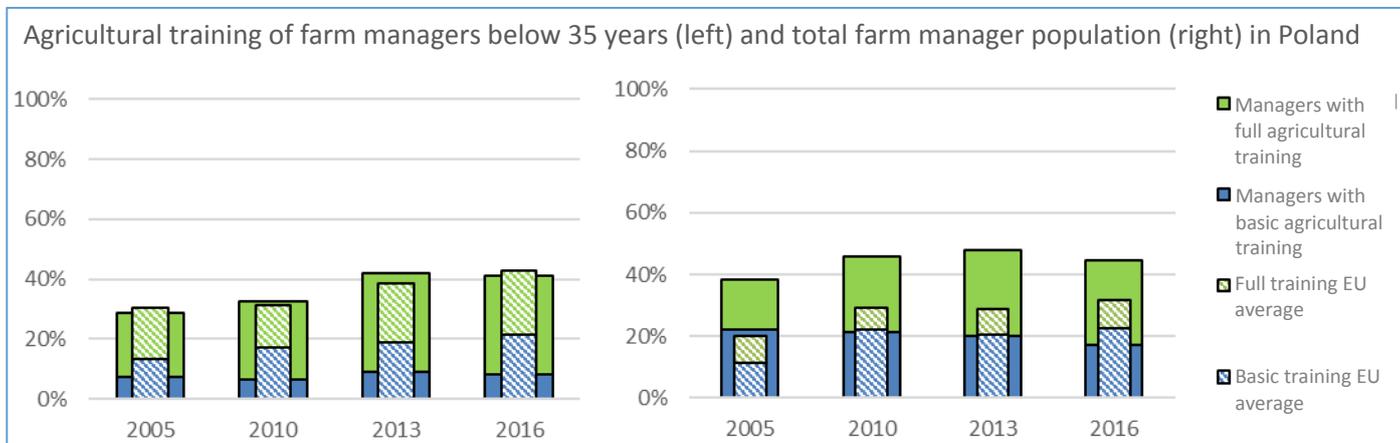
Under the programming period 2014-2020, Poland programmed 1.6% of their total rural development envelope (EAFRD + national contribution) under M01: knowledge transfer and information actions, M02: advisory services, farm management and farm relief services and M16: Co-operation-EIP, compared to the EU-28 average of 3.6%.

In this context, significant synergies are also expected from linking CAP support to activities on soil health (so-called 'living labs and light houses') under the forthcoming Horizon Europe mission on Soil Health.

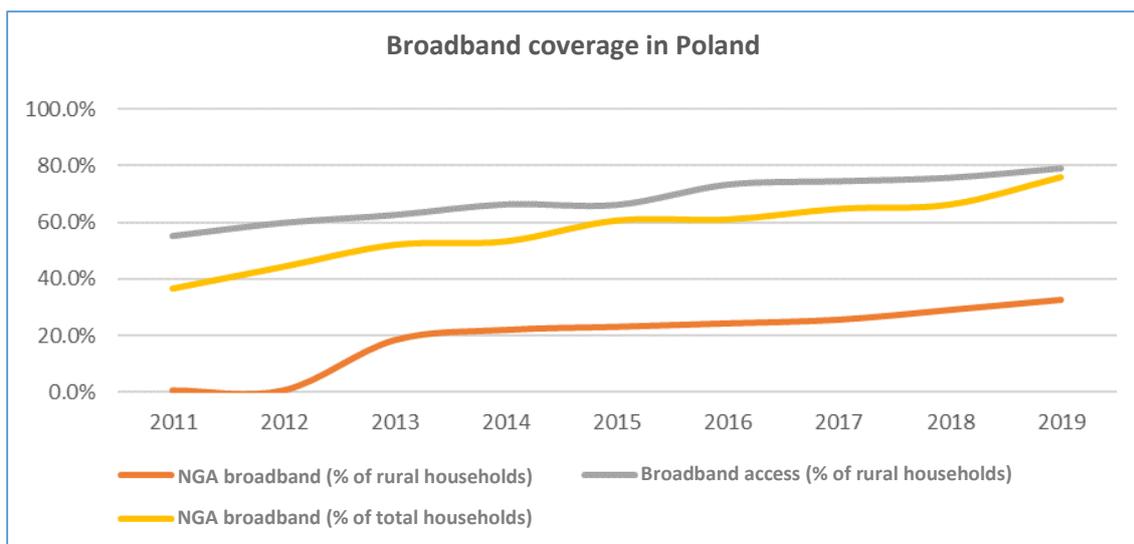
In Poland, 44% of the total farm managers have attained at least basic agricultural training in 2016 (above the EU average of 31.6%). This share is rather stable over the last six years. At 27% in 2016, the share of farmers that attained full agricultural training was significantly above the EU (9%).

Poland has rather traditional digital infrastructure and technologies in agriculture. Looking at the Digital Economy and Society Index (DESI) 2020 ranking, which considers rural and urban areas, Poland ranks 23rd out of 28 EU Member States, indicating its low, below EU average performance but steady digital growth in terms of connectivity, human capital, use of internet services, integration of digital technology and digital public services¹⁰⁵.

Poland has the highest mobile broadband take-up in the EU but fast internet is not available yet for all households. There is a significant connectivity gap among the regions (in 2019, NGA broadband infrastructure: 32.6% of rural households against 76% of all households, broadband access: 79% of rural households). According to the Office of Electronic Communications, the penetration of the next generation network in villages with up to 100 inhabitants is 6%.



Source: EUROSTAT [ef_mp_training]



Source: DESI report

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- ¹ Directorate General for Agriculture and Rural Development. *Common Agriculture Policy context indicator C.26 Agricultural entrepreneurial income*. Income based on EUROSTAT [[aact_eaa01](#)], [[aact_eaa04](#)], [[aact_ali01](#)] and [[aact_eaa06](#)], adding back the compensation of employees to the entrepreneurial income and divided by the total number of annual working units. Note: 2019 data estimated. The Average wage in the economy based on EUROSTAT [[nama_10_a10_e](#)] thousand hours worked using employees domestic concept and [[nama_10_a10](#)], item wages and salaries. Please note that the agricultural entrepreneurial income is given in real and current prices. The calculation methodology is described [here](#).
 - ² Directorate General for Agriculture and Rural Development. *CAP context indicator C.25 Agricultural factor income*. Based on EUROSTAT [[aact_eaa04](#)], [[aact_ali01](#)] and [[aact_eaa06](#)]
 - ³ European Commission. *CAP indicators – Data explorer*. CAP Result indicator RPI_01 Share of direct support in agricultural income (DP) and Directorate General for Agriculture and Rural Development own calculations based on FADN data (up to 2018) (RD)
 - ⁴ Directorate General for Agriculture and Rural Development own calculations based on FADN (Farm Accountancy Data Network) data (2015) and CATS (Clearance of Accounts Trailing System) data (up to 2017)
 - ⁵ Average factor income in “Malopolska i Pogórze” is about a third of the average in “Pomorze i Mazury”: Farm Accountancy Data Network. *FADN Standard reports*. [YEAR.COUNTRY.REGION](#) and own calculations (up to 2018)
 - ⁶ Directorate General for Agriculture and Rural Development own calculations based on FADN data (up to 2018)
 - ⁷ Directorate General for Agriculture and Rural Development own calculations based on FADN (Farm Accountancy Data Network) data (up to 2018) and CATS (Clearance of Accounts Trailing System) data (up to 2018)
 - ⁸ Farm Accountancy Data Network. *FADN Standard reports*. [YEAR.COUNTRY.TF14](#) and own calculations (up to 2018)
 - ⁹ Farm Accountancy Data Network. *FADN Standard reports*. [YEAR.COUNTRY.ANC3](#) and own calculations (up to 2018)
 - ¹⁰ Farm Accountancy Data Network. *FADN Standard reports*. [YEAR.COUNTRY.REGION](#) and own calculations (up to 2018)
 - ¹¹ ECORYS and Wageningen Economic Research *Study on risk management in EU agriculture* 2017, p. 143
 - ¹² European Commission. *CAP context indicator C.14 Labour productivity in agriculture*. Based on EUROSTAT [[aact_eaa01](#)] and [[aact_ali01](#)]
European Commission. *CAP context indicator C.15 Labour productivity in forestry*. Based on EUROSTAT [[for_eco_cp](#)] and [[for_awu](#)]
European Commission. *CAP context indicator C.16 Labour productivity in the food industry*. Based on EUROSTAT [[nama_10_a64](#)] and [[lfsa_egan22d](#)]
 - ¹³ European Commission. *CAP context indicator C.14 Labour productivity in agriculture*. Based on EUROSTAT [[aact_eaa01](#)] and [[aact_ali01](#)]
 - ¹⁴ In 2010, a definition of agricultural holding changed in Poland, more explanation here. Still when comparing figures from 2010 (1,506,620 number of agricultural holding) to 2016 (1,410,700) a slight decrease is noticed.
 - ¹⁵ European Commission. *CAP context indicator C.17 Agricultural holdings (farms)*. Based on EUROSTAT [[ef_m_farmleg](#)]
 - ¹⁶ European Commission. *CAP context indicator C.18 Agricultural area*. Based on EUROSTAT [[apro_cpsh1](#)]
European Commission. *CAP context indicator C.21 Livestock units*. Based on EUROSTAT [[ef_lsk_main](#)], [[ef_lsk_poultry](#)], [[ef_lsk_bovine](#)] and [[ef_lus_main](#)].
 - ¹⁷ https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/production/production-country_en
 - ¹⁸ Polish legal act valid from 2017; and in 2019 modified to introduce a term ‘short supply chain’. (Ustawa z dnia 16 listopada 2016 r. o zmianie niektórych ustaw w celu ułatwienia sprzedaży żywności przez rolników (Dz. U. poz. 1961))
 - ¹⁹ SWOT analysis on Polish direct food sales (Mocne i słabe strony oraz szanse i zagrożenia dla sprzedaży bezpośredniej żywności w Polsce (źródło *Wieś i Rolnictwo* 3 (180)/2018.): https://www.cdr.gov.pl/images/Radom/2019/22-11/Broszura_K%C5%81%C5%BB-18.11.2019ostateczna.pdf
 - ²⁰ 2018 Polish annual report on fruit and vegetables

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- 21 Based on ESTAT 2016 data, from Study of the best ways for producer organisations to be formed, carry out their activities and be supported, <https://op.europa.eu/en/publication-detail/-/publication/2c31a562-eef5-11e9-a32c-01aa75ed71a1>
- 22 https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/apple-dashboard_en.pdf
- 23 European Environmental Agency (EEA). *EEA greenhouse gas – data viewer*.
- 24 European Environmental Agency (EEA). *EEA greenhouse gas – data viewer*.
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