Interreg CENTRAL EUROPE
European Union European Regional Development Fund

Transfarm4.0

DELIVERABLE D.T1.3.2

SWOT ANALYSIS TO HIGHLIGHT CRITICALITIES AND ASSET IN PRECISION FARMING UPTAKE

Poland

Version 1
01/2020

1. SWOT analysis – Poland[1]

1.1. General Information

According to Evenson and Pingala, around 1% of innovations come from the agricultural sector, while more than 80% of agricultural patents are supplied by other sectors, such as chemical, pharmaceutical or machinery. This is due to the specificity of manufacturing processes, the type of materials used and technology. Industry working for agriculture (e.g. production of new plant varieties, plant protection products and livestock breeds) participates in around 45% of agricultural R&D.

In 2017, out of over 1.4 million farms in Poland, only 15,470, i.e. only about 1% of all, were certified organic farms, and a further 4,787 farms were at that time in the transition to ecological activities19. These farms covered an area of over 380,000 hectares20, which is only about 2.6% of the total agricultural area. It should also be emphasized that the number of farms of this type has been decreasing for several years, which may indicate the existence of barriers to discouraging organic farming

High financial costs associated with the purchase of special equipment. In addition, farmers who undertake to implement these modern methods must constantly improve their knowledge in order to fully utilize the potential of precision farming. Precision farming in Poland is unfortunately still rare. This is connected not only with the garden of investments that need to be carried out, but also with the structure of Polish agriculture. In our country, crushing of farms is dominant, and precision farming is used in large-scale farms.

Innovative activity in Polish agriculture faces many barriers, including a fragmented agrarian structure, insufficient transfer of knowledge to farmers or low resource supply. Until now, most Polish farms have adopted a strategy of imitation (adaptation) of various types of innovation.

Supporters of precision farming are primarily less than 40 years old, have a university degree and cultivate over 200 hectares of land, and the provisions of national law changed in 2018, limiting the purchase of land by private individuals, foreign buyers, which causes a continuous increase in the area of farms.

[1] Provided from KIRG: Pawel Materka et.al. (2020)

1.2. Strengths

The most important strengths supporting the use of PA for Polish agriculture are:

- relatively favorable age structure of rural population - a high percentage of young people, - large concentrations of people in rural areas despite migration to cities
- low degree of specialization giving high flexibility in changing production direction
- relatively good soil condition in Poland
- progressive modernization of the processing sector and a large processing raw material base
- proximity of sales markets and the market of Eastern countries, the single European market, as well as experience gained in obtaining funds from structural funds and subsidies for agriculture.

An important form of educating farmers about PF are frequent agricultural fairs, exhibitions and workshops on precision farming.

Poland is in third place in Europe due to the share of agricultural area in the total area of the country. The countries ahead of Poland are France and Spain. This area is 18 608 thousand hectares, i.e. 56% of the entire country. Such a large surface area allows the land to be used less intensively as well as the use of environmentally friendly production methods.

Thanks to investments (including those co-financed from EU funds), the Polish food industry is one of the most modern in Europe, and companies can successfully compete with producers from other EU countries

One of the most advanced precision farming technologies is the possibility of applying variable doses of mineral fertilizers tailored to the soil conditions of a given field zone and plant nutritional requirements.

In connection with positioning by means of a satellite signal, application of a variable dose of pesticides based on application maps has become possible. Yield maps are also used to create fertilizer, seed and pesticide application maps.

1.3. Weaknesses

Weaknesses of Polish agriculture are also a whole group of brokers of agricultural products and PA technologies delivered to the Polish market.

In Poland, the concept of precision farming is not often used, while young farmers are increasingly using new solutions. However, the agri-food sector is considered a sector with little innovation.

Statistically speaking, about 1.2 million farms (i.e. about 80% of the total farms with an area of more than 1 ha) do not have the capacity to restore and modernize their production potential, and so:

- The low quality of the education system is not conducive to the implementation of PF practice and the establishment of start-ups dealing with PF

- Currently, when competition in the market intensifies, innovation generation processes may prove to be a more effective strategy. They are more effective in the conditions of growing volatility of the environment, when market demand becomes more and more uncertain and competitors' actions more and more unpredictable. Research by Józwiak et al. 20 showed that about 38% of domestic farms with a size of 2 and more ESU has at their disposal permanent or periodic means for implementing various types of innovations. However, taking into account the total number of farms in the country with an area of 1 ha and more, this share is only 18-19%. Potential innovators should be seen among these farms.

Direct payments are the most common type of support for agriculture in Poland. Every year, around 1.4 million farmers use them, 87% of farms over 1 ha use this form of assistance.

A large part of agricultural imports are products that are not cultivated in the country, and imported to supply the domestic market and for processing in the food industry and re-export as processed products. However, this does not apply to animal products, especially pigs and pork.

An important weakness of Polish agriculture is also the poor vertical and horizontal integration in the agri-food sector and low inclinations to joint actions, as well as the growing income disparities between small and large-scale farms

There are also not many producers and sellers of agricultural equipment, the latest technologies for farms in Poland are available, and a large number of interested parties could generate good competition in favor of the development and dissemination of new technologies.

1.4. Opportunities

The main development opportunities of PF in Poland include:

- extending Polish agriculture to the Common Agricultural Policy (CAP) and structural funds, guarantees a departure from supporting production intensification and increasing the freedom to make production decisions
- development of non-agricultural activities in rural areas, support from structural funds for this type of activities, diversification of agricultural activities, a large internal market for
- rural areas associated with the potential increase in purchasing power,
- a large single EU market,
- changing the expectations of the population in the EU regarding the social functions of agriculture in favor of multifunctional agriculture,
- changing consumer expectations regarding production methods in favor of extensive, environmentally friendly, animal health and welfare
- preferences of Polish consumers towards Polish food
- gradual adaptation of EU technologies and management methods
- transfer of economic activity to rural areas
- opening of the JRE for Polish producers of organic, traditional and regional food.

The profitability of applying PA technology increases with the passage of years after the adoption of the technology and this is beginning to be noticed by farmers who, thanks to EU subsidies, are increasingly willing to equip themselves with PF technologies.

The combination of direct payments and cross compliance requirements means that this form of support can fulfill a key role in providing basic public goods through sustainable management of agricultural land (preservation of landscape values, biodiversity, water availability, climate stabilization and air quality) or unrelated public goods with the environment (active in rural areas)

In addition to economic benefits, technologies are gaining popularity, including due to lower environmental impact and performance, and:

- limited to the necessary minimum of concentrated fertilizers and plant protection products
- increasing plant yielding by introducing precision fertilization
- reduction of environmental contamination by means of sustainable development
- lower financial outlays for agrotechnical operations and improvement of the efficiency of using the means of production
- faster and more efficient field work and increased productivity of people and machines
- the possibility of carrying out agro-technical procedures not depending on the weather conditions
- preparing accurate data on the size and quality of crops
- the possibility of saving the cropland's efficiency and profitability in an easy way
- easier and more effective management of the farm
- improving management and working conditions on the farm
- reduction of production costs
- optimization of agricultural produce quality

- reduction of environmental pollution

- improving the degree of sustainability of the cultivation system, i.e. selection of the dose of the means of production to the spatially diverse demand for it

1.5. Threats

Open competition on the world market, which is a manifestation of globalization, brings more threats to Polish agriculture than development opportunities. These threats are, of course, neutralized by integration with the EU, but EU agriculture is also unlikely to face open competition on the world market

In Poland, almost only the largest farmers are interested in new technologies due to their high affinity for innovations that increase the sustainability of farms and improve management (eg simplifying bureaucracy, reducing the use of pesticides, etc.).

Low professional mobility of inhabitants of rural areas, regional diversification regarding farm fragmentation in one part of Poland, and sufficient for the application of PF technology in other regions of the country.

Insufficient awareness of agricultural producers regarding climate change. One of the threats that farmers see is global warming, which causes instability in weather conditions and their unpredictability, including for lack of rainfall, natural disasters

An important threat is also the divergence of rural development priorities and agricultural policy between developed EU countries and Poland, and a reduction in support for European agriculture as a result of WTO negotiations

The diverse level of education and qualifications of the rural population, including farmers, with a large group of people with low qualifications and skills, is a limited opportunity to improve the education of the rural population. As a result of low farmers' awareness and poor social infrastructure, only most young farmers are aware of education and education, as well as the need for continuous improvement and innovation.

Rapid development of agricultural production in countries with low production costs, it is necessary to incur large expenses in a short time to adapt to EU standards.