

Suitability of SAPARD Methods in the Post-War Recovery of Ukraine's Agricultural Economy

Sofiia Yanchuk

Queen Anne's School, Caversham, Berkshire, RG4 6DX, United Kingdom; s.m.yanchuk@gmail.com

Mentor: Georgios Aivaliotis

ABSTRACT: The Russo-Ukrainian war poses challenges for Ukraine's previously leading agricultural sector. In this paper, we aim to investigate how SAPARD (Special Accession Program for Agriculture and Rural Development) methods could benefit Ukraine's agricultural sector during the war. We provide a short literature review of Ukraine's needs in the agricultural sector recovery, and take Poland's SAPARD as an example of a successful agriculture modernization strategy during the pre-EU accession period. Then we use comparative analysis to evaluate the extent to which the same methods would be beneficial for Ukraine and which differences might exist in a similar program in Ukraine. The research proves that a SAPARD program would be partially beneficial for rebuilding Ukraine's agriculture, including the implementation of Measures 1, 2, and 3: Improving the Processing and Marketing of Agricultural and Fishery products, Investment in Agricultural holdings, and Development and Improvement of Rural Infrastructure. These Measures would increase agricultural productivity in Ukraine, restore transport links, encourage demining, and provide Agrocompanies with modernized machinery and technologies, while Measures 4, 5, 6, and 7 would mainly be helpful for Ukraine's EU integration. Additionally, we describe some differences in the organization of SAPARD Measures in Ukraine to achieve maximum efficiency.

KEYWORDS: Plant Sciences, Agriculture and Agronomy, Ecology, Agricultural Economics, War in Ukraine, SAPARD.

■ Introduction

The Russian-Ukrainian war, which started on the 24th of February 2022, has brought significant human losses and damage to all sectors of the economy. It also significantly affected the Agricultural sector, accounting for around 10% of Ukraine's GDP and providing 14% of employment in the pre-war period.⁸ According to the RDNA4 (2024) annual report, total agricultural damage is US\$11 billion, accounting for 6% of the total damage.¹³ On average, 200 kilograms of crops per hectare, including sunflower, wheat, barley, corn, and soybeans, were damaged by the war in 2022.¹¹ Given all the above, planning for the modernization, recovery, and reconstruction of Ukraine's agriculture in the post-war period is critical.

Several research papers and policy papers suggest improvements, while also emphasizing that the recovery of Ukraine will take place in parallel with EU integration.⁸ While searching for past project frameworks, researchers often turn to the experience of Poland, which is characterized by similar climate conditions and which has gone through a similar process of modernization in the early 2000s as part of SAPARD (Special Accession Program for Agriculture and Rural Development). Thus, they recommend considering SAPARD methods as part of Ukraine's post-war recovery.³

The Special Accession Program for Agriculture and Rural Development, SAPARD, was established in 1999 in 10 countries, including Poland, on their way to EU integration. With the main aim of preparing farmers and food processors for the strict EU veterinary and sanitary norms, it focused on agricultural modernization and rural development in Poland. The program's funds came from 2 sources: EU funds (75%) and

national co-financing (25%).¹⁰ The program's outcomes in the Lodz region included increased efficiency in food production, enhanced export capabilities, and improved quality of raw materials.²

In this paper, we aim to answer the question: What are the predicted effects of SAPARD methods on the Ukrainian recovery? For this aim, we use comparative analysis to examine how the potential implementation of each of the 7 SAPARD Measures in Ukraine's post-war recovery would benefit the restoration of the Agricultural sector of the economy. We provide a brief overview of the benefits and drawbacks of SAPARD, along with the primary methods used and the program's structure and organization. Then we compare Ukraine's current needs in the Agricultural Sector and use a comparative analysis to understand to what extent each Measure will work for Ukraine and which main aim each Measure will achieve. We also outline actions that could be taken to minimize the limitations of a SAPARD-like program in Ukraine, based on the Polish experience and the program's organization.

Additionally, we outline several crucial differences between the situations in Poland and Ukraine, which pose further limitations: the SAPARD program was part of Poland's transition to the EU. At the same time, Ukraine's key aim is post-war recovery.

The rest of the paper is organized as follows: In the next section, we include a short literature review highlighting the importance of agriculture in Ukraine's economy and the most commonly outlined needs and strategies for Ukraine's restoration, based on past papers. Next, we provide an overview of each of the 1-7 SAPARD Measures in Poland, including the

key benefits and limitations of their implementation towards overall economic performance in Poland and, specifically, in the Lodz region during the EU accession period. We also discuss the benefits and limitations of the organization and supervision of SAPARD performance in Poland. This section is followed by the comparative analysis, where we go through each of the Measures, compare their main aims and achievements with Ukraine's current needs, and identify possible drawbacks or differences in the outcomes. Finally, we use the available literature to discuss the sources of funding for a SAPARD-like program in Ukraine and outline possible limitations the program might face in Ukraine.

■ Methods

Background Information:

Over the 2001-2018 period, agri-food exports in Ukraine increased by 5.5 times, while imports rose by only 2.4 times in absolute terms, indicating that Ukraine was a net exporter (Figure 1).⁸ Ukraine became the world's leading sunflower oil exporter, with its main trading partners accounting for up to 45% of revenue: Asia (32%), Europe (32%), and the Middle East and North Africa (14%). Ukraine's significant contribution to global food security is feeding 332 million people. The share of the Agricultural sector in a country's GDP ranged from 6.5% to 14% during the 2001-2018 period. At the same time, the share of the population employed in the Agricultural sector was 15% in 2018, higher than in other European countries (Germany: 1%; France: 3%), according to the World Bank's open data.¹³ Grain is one of the most important crops produced in Ukraine. In the land structure, the highest yields were observed in the central part of Ukraine, with yields in other regions lower. This leads us to conclude that the war's impact and the occupation of 12% of mainly Eastern and Southern Ukraine significantly affected the production of the above-mentioned agricultural products.

At the start of the war in 2022, around 25% of rural households reduced or stopped agricultural production, mainly in the Southern and Eastern regions of Ukraine. At the beginning of the war, a significant decline in production was observed across all agricultural goods, with the most pronounced effects in vegetable and leguminous crops, which fell by 21.2% and 21.4%, respectively. It is important to mention not only the production of crops themselves, but also the amount of arable land available, which has declined due to mined areas that now cover up to 40% of Ukraine's territory. In addition to damage to production capacity, the author also highlights significant losses in the number of agricultural enterprises and equipment.⁶ The impact of the war on agricultural production was also analyzed using the AIRMAX model, which compared theoretical yields with actual yields in 2022 for the 6 most important crops in Ukraine: wheat, sunflower oil, rapeseed, barley, corn, and soy. The slightly different results from the above showed declines of 346 kg/ha for barley, 136 kg/ha for wheat, and 246 kg/ha for sunflower oil.¹¹ The total need for rebuilding Ukraine's Agriculture is \$11.2 billion as of the very beginning of 2025.¹³

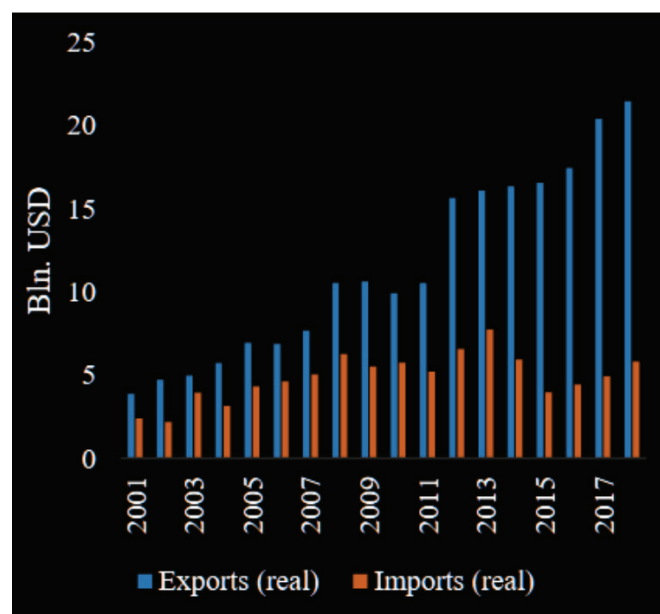


Figure 1: Real agri-food trade in Ukraine 2001-2018 in USD bln (in 2010 prices). It shows that Ukraine was the net exporter of agricultural production in the 2001-2017 period.⁸

The rebuilding of Ukraine's Agriculture should proceed through 4 stages, from urgent needs after the ceasefire to long-term EU integration over 5 years. At all stages, the attraction of foreign investment, modernization of agricultural equipment, restoration of export routes, specifically from the Black Sea, diversification, and retraining of the rural workforce are prioritized.¹ Attraction of the rural workforce and their training to identify landmines is highlighted as a key element in the post war rebuilding, in addition to the previously mentioned land-cleaning initiatives. Notably, the paper highlights the SAPARD program's successful experience in modernizing equipment and machinery in Central and Eastern Europe and the potential benefits of similar actions in Ukraine.³ Poland is cited as a case study of a country that followed a similar path in 2004. The SAPARD program is mentioned there as one that has primarily benefited the modernization of the agricultural sector. The research powerfully highlights the potential benefits for Ukraine from implementing a similar recovery strategy, with a specific focus on small-scale farms.¹²

Most of the researchers agree that the key initial step is to restore the functioning of the market at the maximum possible level, including demining and the alignment of the export routes with European standards, and to focus on restoring and modernizing the machinery and equipment, enhancing export routes, demining, and increasing productivity. After that, the focus should be on aligning Ukraine's Agriculture with EU norms, including sanitary and veterinary standards. For all stages, international support and funding are needed. The SAPARD program is mentioned several times as a successful example adopted by Central and Eastern European countries on the path to EU integration. We need to understand what the program methods entail, which of them led to the most significant improvements, and what might be used by Ukraine. Additionally, we should focus on the program's limitations and the differences between the SAPARD participants and

post-war Ukraine. For this research, we analyze the SAPARD program in Poland, given its similar post-Soviet past, climate conditions, crops produced, and relatively recent EU membership

What is SAPARD, its results, and limitations?:

The Special Accession Program for Agriculture and Rural Development, SAPARD, was established in 1999 in 10 countries, including Poland, on their way to EU integration. With 75% funding from the European Union (EUR 708.2 mln) and 25% (EUR 235.8 mln) from local co-financing, SAPARD in Poland, which accounted for 7% of GDP in 1995, focused on modernizing agriculture and rural development.

Before the implementation of SAPARD in Poland in 1884, 1,884 farms above 1ha were private, and 1.6 were public. The farms of 5-10 ha were the largest group in Poland, accounting for 24% of all farms. (Broyaka *et al.*). The organization of SAPARD in Poland was carried out by 2 main, very centralized organizations: ARMA (Agency for Restructuring and Modernization of Agriculture) and the Ministry of Agriculture and Rural Development (MARD), under the control of the European Commission. The process for farmers included confirming eligibility and submitting applications for specific Measures, meaning that individual farms could apply to all Measures or only to several of them. In case of success, 50% of the grants were distributed to farmers for the development of a specific Measure. The mid-term evaluation, monitoring, and control of the performance.⁷

In Poland, several measures of the SAPARD program were implemented.^{2,7}

Measure 1: Improving the Processing and Marketing of Agricultural and Fishery Products

Before the implementation of the SAPARD measures, Polish farms were characterized by low efficiency and obsolete machinery. Given the high unemployment level in Agriculture at this time, the products were of low quality and low value added. This means that the improvements in this Measure enabled higher efficiency in the processing of Agricultural and Fishery products, allowing farmers to process more raw materials into complete products. It included the installation and development of the machinery and the more efficient processing schemes. It then allowed farms to generate higher profits by increasing their value added, thereby directly improving the sector's profitability.

Measure 2: Investment in Agricultural holdings

Together with Measure 1, Measure 2 focused on generating value added and increasing profits. Unlike Measure 1, Measure 2 focused on product improvements and modernization, leading to the creation of new meat and milk production and increased environmental protection under this scheme. This and the previous Measure were key in driving the modernization and development of the agricultural holdings, which led to increased welfare for the farmers working in the industry.

Measure 3: Development and Improvement of Rural Infrastructure

This was one of the largest problems affecting the attractiveness and attracting foreign investment to Polish agriculture. The rapid development of this section of Economics in the late 1990s resulted in an imbalance in the allocation of infrastructure facilities. For example, only approximately 15% of the farms were connected to sewage systems, and the average age of the tractors was 16 years. The same problem was with the gas supply and the dumping sites. The SAPARD program thus solved this problem by directly providing these facilities. As a result, there is again greater worker and investor attractiveness towards rural areas. As a result, it began the Multiplier effect and brought significant income to Polish agriculture.

Measure 4: Diversification of Economic Activities in the Rural Area

This Measure was an important one for Polish Agricultural development, mainly due to the high level of unemployment and the obsolete machinery in use. Diversified economic activities created the potential for higher employment in the industry and increased farm profitability. The key improvements were achieved by financially supporting the farms and farm holders through direct investments and financing for tourist facilities. However, the Measure was delivered with a significant delay due to organizational issues, thereby limiting the results. Additionally, under the new activities, none were developed for environmental protection, indicating a lack of sustainability actions in Poland compared to other EU members. The Measure, which could have been strong, was limited by the organization and the regional government's lack of attention to it.

Measure 5: Agri-Environmental measure ups and Afforestation (was withdrawn from the program later and implemented under another program in 2004-2006)

Together with Measures 6 and 7, which were considered complementary Measures, less attention was paid to their development. This Measure was later canceled, so overall performance in this section was limited. Given that environmental protection was a marginal part of Measure 6, this suggests that the aim of increasing farm sustainability was the smallest among the other measures.

Measure 6: Vocational Training for Beneficiaries and Measure 7: Technical Assistance for Beneficiaries

These measures primarily focused on training in the use of new technologies and machinery to maintain high efficiency and increase farm profitability. Even though the Measures helped farmers gain basic knowledge of food processing, they focused almost entirely on veterinary, sanitary, and environmental measures, which were identified as important factors for EU accession. Thus, these Measures were complementary, meaning that their underdevelopment did not result in a decline in SAPARD benefits.

Analyzing the structure of the applications, around 85% of farmers in the Lodz region applied for diversification of the sector, even though this Measure accounted for only 10% of the available funds. The most significant part of the program focused on modernizing the agricultural holdings, supporting

farmers in buying agricultural machinery, upgrading agricultural production to meet EU standards, building roads, enhancing basic services, and promoting economic diversification. (Figure 2) A significant benefit of the program was the experience in using European Union funds for agriculture, which was one of Poland's first at the time. Participation in the program was mainly beneficial for large and medium-sized agrohholdings, the development and modernization of which later led Poland to become one of the major exporters of agricultural products in Europe, especially meat, while grain exports decreased. What is more, the program had a significant impact on the quality and sanitary adjustments to EU standards.²

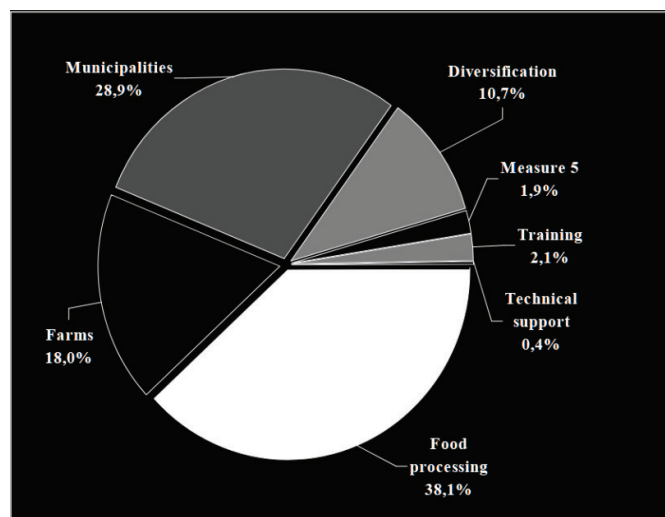


Figure 2: The planned structure of SAPARD expenditure in Poland. It shows that the greatest amount of funds was spent on the Food Processing (38.1%).²

At the same time, the application and organization model was imperfect, as the spatial differences in regional development were neglected and provincial authorities were excluded from decision-making and resource allocation. This means that the lowest control level was the regional one, which could not account for all the limitations and needs associated with SAPARD individual performance. These problems became visible as a result of SAPARD, which mainly benefited richer regions and large-scale agriholdings. Due to the lack of communication between regional and centralized authorities, the small- and medium-sized agrohholdings almost did not benefit from the program. Additionally, the program's limitation was a 50-year age restriction on farmers' applications, so anyone over this age was not eligible to apply. This means that only some of the farms could have benefited from the mentioned measures, whereas others' needs were neglected.⁷

In Poland, the increase in productivity on large-scale farms led to higher farm profitability and a stronger economy overall. The incomes of program beneficiaries increased by 20% on average. Thus, it led to economic growth, development, and modernization of agricultural holdings in Poland. The main benefits of SAPARD were associated with the renovation of obsolete machinery and rural infrastructure and the attraction of investments into the sector, as well as the production diversification, which allowed the increase in the value added

of the production, helping Poland to become one of the main exporters of Agricultural goods among the EU members. At the same time, the main aim of the program, which was rural development, was not fully achieved, as shown by measures such as unemployment and limited improvements in environmental initiatives. This was mainly due to problems with the organization and the underestimation of some of the Measures, including Measures 5, 6, and 7. These Measures were mainly responsible for the development and implementation of sanitary, veterinary, and ecological measures, and their underdevelopment set Poland partially behind the European standards. The organization and delivery of the program were also limited for smaller farms, older participants, and less wealthy regions, which made the extent of the program much smaller than expected at first.

Suitability of SAPARD in the rebuilding of Ukraine's Agriculture:

This research focuses on qualitative comparative policy analysis to understand the extent to which, and how, the SAPARD program's methods would benefit Ukraine's post-war agricultural recovery. To do this, we analyze the implementation process of each of the Measures in Poland, including their main successes and limitations. After this, we compare the outcomes in Poland with the situation in Ukraine and decide to what extent the strategies might be suitable. This will help us decide when, and if, the SAPARD methods should be implemented.

Measure 1: Improving the Processing and Marketing of Agricultural and Fishery products.

According to the papers discussed above, the most important agricultural products in Ukraine were wheat, sunflower oil, rapeseed, barley, corn, and soy. All of these have experienced significant declines due to the war and cannot be produced now at the same capacity as before the full-scale invasion. This leads us to the thought that the income generated from the exports of these products is not as high as before, and will not be at the same capacity level right after the war, because some territories, especially in the South and East of Ukraine, will require demining, which will take a significant amount of time.

In Poland, Measure 1 worked to increase the value added in the production of fishery and meat by expanding processing and marketing of agricultural goods, including the renovation of old techniques to increase production efficiency. As a result, Polish agricultural holdings became more competitive on the European Market and were able to meet European sanitary standards, while individuals gained higher profits.

Higher efficiency and value added in agricultural production would be a highly suitable way to recover Ukraine's Agriculture after the war. For example, wheat grown in the central part of Ukraine, which has experienced a minor impact of the war, might be processed into white flour. Corn might be processed into corn flakes or popcorn, thereby increasing its value. The improvements in the processing and marketing of agricultural goods in Ukraine will improve net trade, generating higher incomes within the economy and enabling the use of funds for demining the affected territories and the recovery of the

rural economy. Under this, higher employability in rural areas may contribute to labor reintegration. It is an important factor in the country's recovery, as the affected areas will gradually return to life.

Additionally, the wide range of production in the economy is a key element of EU integration for Ukraine. This means that the processing of agricultural goods and their compliance with EU sanitary standards will likely lead to faster integration in the long run.

Even though Measure 1 is well-suited to Ukraine and will lead to significant economic development, including greater profitability, post-war recovery, and EU accession, there may be some problems and limitations in implementing this Measure. First of all, Poland had functional, highly efficient logistics during the Measure implementation period, which Ukraine does not have. This will limit the extent to which agricultural goods can be exported. Additionally, the 40% land mining in Ukraine is a factor preventing the safety of the Measure's implementation. It will be dangerous to increase production in the rural regions straight after the war. Lastly, the great variety of goods produced was the main aim of Poland in this Measure. In contrast, in Ukraine, 30 years later, processing is already at a highly competitive level, so the impact of the Measure will not be as obvious as it was for the applicants in Poland.

Still, the limitations for the Measure implementation are mostly short-term, meaning that even if the exports of the goods will be more challenging in terms of logistics and land demining in the first stages, in the long term, it will increase the profitability of the individual holdings and improve the net trade, leading to the growth within the economy overall. The renovation of the obsolete and damaged machinery will lead to long-term value-added generation and an additional source of income, which can then be used to tackle other war-related damage.

Measure 2: Investment in Agricultural holdings.

In Poland, this scheme worked by investing in the functionality and productivity of farm equipment. Before implementation, Polish agriculture was characterized by obsolete machinery and inefficient use of technology, which set the economy back compared to other EU members. The Measure functioned by providing co-financed support for farms to purchase modern machinery. The success of the SAPARD Measure 2 thus depended on the large investments in purchasing new machinery. This helped the country modernize its production, thereby improving productivity and value added, which led to economic growth.

This Measure would be a powerful tool for returning the potential and productivity of Ukrainian farms. It might be done by replacing the damaged machinery in the South and East, and renovating the obsolete machinery in the West. This would help Ukrainian Agriculture meet EU requirements for modernizing techniques.

Even though the Measure is highly suitable for both economic recovery and EU integration, there may still be limitations to its development. First of all, the mined territories would not allow control over the functionality of this Measure

across all territories. Secondly, it is important to ensure that the applications have different aims, whether restoration or renovation. Thus, the Measure should include different application methodologies for Western Ukraine and South-Eastern Ukraine. The greatest amount of funds should be allocated to restoring the damaged machinery after the war. In contrast, a smaller amount should be allocated to renovating obsolete machinery in the West. Also, resources should first be allocated to post-war recovery and only then to renovation and modernization.

Still, this Measure is highly suitable for the recovery of Ukraine's Agriculture after the war and for EU accession. It is important to note that this Measure will only work efficiently if Measures 6 and 7 are not limited as they were in Poland during SAPARD. In this case, the use of the new machinery will be the most efficient, and the highest profits could be generated. However, overall, the modernization and restoration of the Ukrainian farms at a high level can be achieved through Measure 2. If the government controls the division of funding between restoration and modernization, the program will be the most successful. This is one of the most important SAPARD measures that should be implemented in Ukraine as well.

Measure 3: Development and Improvement of Rural Infrastructure.

The development and improvement of rural infrastructure helped Poland build the sewage systems and networks needed for the more efficient operation of the holdings. The direct results were the sector's greater attractiveness to investors and the higher profitability of the holdings. Additionally, production became easier and more environmentally friendly, allowing Poland to meet European standards and become one of the largest exporters of agricultural products in the European Union.

The main reasons for the quick success of this Measure of SAPARD were the stability of the organizational institutions. What is different from the Ukrainian situation is that Poland did not experience any infrastructure damage, so the main goal of Measure 3 was the modernization of the existing system rather than the repair of damaged infrastructure. The main actions done by Measure 3 were in the installation of the new system.

Measure 3 is one of the key factors that should be implemented for the redevelopment of Ukraine. As seen in the previous sources, transporting agricultural products in Ukraine is often difficult due to poor road conditions, and, as CEMA shows, railway services are unsuitable for export due to war-related destruction. Additionally, the war's damage includes infrastructure. With improved infrastructure, farmers would be able to expand their farms and attract workers, which is important given that over 6 million Ukrainians emigrated after the beginning of the war, and 600,000 are now part of the national army. In the long term, this will improve logistics services and networks, allowing higher profitability and efficiency in imports, while the quality of agricultural production will also improve.

However, the key difference and potential problem with the implementation of the Measure is that most of the rural infrastructure is either partially obsolete in Western Ukraine or totally damaged in the South and East of Ukraine. So the implementation of Measure 3 will involve both the installation of the new networks and the removal of the damaged ones, in addition to their modernization, as in Poland. This means there may be a higher cost to the organization. For the Measure to be effective, it is also important that the government and regulatory bodies ensure that the highest amounts of financial resources and, thus, the highest number of applications come from Eastern and Southern Ukraine. In contrast, applications from Western regions are mostly focused on modernization and are less price-sensitive. If this is not controlled, it might lead to inefficient resource allocation, where less damaged territories use a higher percentage of the funds. In this case, the situation might be similar to the one that happened in Poland, where only the wealthier farms achieved the greatest success.

To make the control and distribution of these main roles as effective as possible, there might be a plan to divide this Measure into 2 submeasures, each covering a different part of Ukraine and with different levels of funding. In this case, there is a high probability of the development and restoration of logistics services, transport networks, and rural systems, which will restore the potential of Ukraine as the biggest exporter of wheat and sunflower oil before the beginning of the war.

Measure 4: Diversification of Economic Activities in the Rural Area.

In Poland, the diversification of economic activities meant direct financing of the farming industry to expand its range of activities. The Measure aimed to modernize older farming techniques and promote the farming industry to youth to increase their engagement in the sector and their employment in it. The Measure was important for Poland because the agricultural sector was underdeveloped, and much of the land was unused in many areas. It was important as well, given the prevalence of the elderly in the agricultural sector and the shortage of young, well-educated professionals.

However, if you compare this Measure with the current situation in Ukraine, a large share of economic activity is conducted in rural areas. Additionally, arable land accounts for 56.8%, and most farms' productivity is relatively high.¹³ There is already an established "status" for Ukraine on the international market as an exporter of wheat, oil, and corn. Ukraine's market share in international agricultural trade was very high, and major agroholdings, such as Kernel and MXII, deliver a wide range of activities.

From this analysis, we understand that this Measure will not have a significant impact on the restoration of the agricultural sector. This is because of the already high productivity before the war, the relatively well-developed land, and the production on it. The implementation of this Measure will require substantial management across different governance layers and a substantial financial commitment. However, the consequences will only be positive for the small farms, which will be able to maximize their profit. This would benefit the development of

the economy and the growth of the sector. However, the overall state of the sector is not as underdeveloped as it was in Poland before the EU accession. For Poland, it was the first step toward becoming a global exporter of agricultural production, whereas Ukraine had already taken this step before the 2022 war.

As part of the EU accession, Ukraine would benefit from the development of sanitary and veterinary standards for smaller and medium-sized holdings. In contrast, for war recovery, logistics and demining should be carried out first, with additional focus on attracting residents back to the rural areas and on their ability to produce goods using the renovated machinery and new techniques. Neither of these needs is outlined by Measure 4 of SAPARD in Poland, so the Measure will not be highly beneficial for Ukraine in the post-war period. However, this Measure might be done in the 5+ year perspective for the targeted areas with underdeveloped holdings in specific regions, which will require it most. However, this will probably be part of the internal, internally financed project undertaken by the Ukrainian government to gain even higher market share on the global market. This Measure is therefore not suitable for Ukraine's current needs in the post-war recovery and EU integration.

Measure 5: Agri-Environmental measure ups and Afforestation.

In Poland, this Measure was introduced to address environmental development in the area and to align with EU standards. However, much less attention and fewer funds were devoted to this Measure, which limited its overall performance. Later on, the withdrawal of Measure 5 from the SAPARD program highlighted that the main achievement of SAPARD was in the region's economic development, rather than alignment with EU veterinary and sanitary standards or environmental sustainability.

As part of EU integration, several sources from the literature review mentioned above recommend implementing this Measure in Ukraine. Also, in the case of Ukraine, it is likely associated with land demining after the war and the resolution of soil degradation problems, as currently up to 40% of the arable land in Ukraine is classified as contaminated by land mines. After the war, contamination of a large area was observed, and it is essential to address this problem. The Measure should be highly suitable for dealing with pollution and land management in Ukraine. It is also important to ensure these methods are implemented across different-scale farms, as most large agroholdings have the appropriate environmental conditions, while the smaller ones do not.⁸

In terms of afforestation, Ukraine has lost 12% of its forest cover over the last 24 years. To some extent, deforestation is a problem in the Eastern regions of Ukraine, where fires have destroyed significant areas. Still, the problem of deforestation is mainly associated with the Kyiv, Rivne, and Zhytomyr regions, which were not significantly affected by the war (Global Forest Watch).

Overall, this Measure has a long-term benefit for Ukraine when it focuses on alignment with the EU and environmental sustainability. However, this action will likely not be taken in

the first year after the war ends, as the main aims will be in the restoration of the logistic paths, land demining, and restoration of the damaged machinery to increase the productivity of farms and to begin to generate the profits, which can be later used for the co-financing of these environmental Measures. So Measure 5 will likely become the priority only in the long-term perspective of the recovery in 2+ years after the end of the

Measure 6: Vocational Training for beneficiaries and Measure 7: Technical Assistance for beneficiaries.

This is an important way of integrating Ukraine's Agriculture into the EU. Under the successful implementation of Measures 2 and 3, the great majority of the newly generated workforce would need to use the infrastructure and technologies. The implementation of vocational training would improve the productivity of the Agricultural holdings and generate more income. As a result, small-scale farms could turn into modern ones.

However, in Poland, the implementation included training individuals to use the new machinery rather than addressing the steps contributing to sanitary, veterinary, and environmental standards. This means that if these Measures are planned for the Ukrainian post-war recovery, it would be beneficial, though with a slightly shifting focus on EU integration. As there are no significant problems with the use of the machinery, but with environmental issues and development, the attraction of professionals from abroad would help. Additionally, the training may include topics such as land demining techniques, logistics, and the acknowledgment of new trading partners. Lastly, even though these Measures are highly suitable and useful for the functioning of Ukrainian agriculture after the war, their implementation will not be a priority after the end of the war, when the restoration of functionality and the survival of farms will be prioritized. They might be working for EU integration in the long-term 3+ year plan, but not as an immediate action.

Organization:

There should also be changes to the organization of SAPARD in Ukraine that take into account the challenges Poland faced previously. First of all, SAPARD control in Poland was mainly managed at the national level, with regional committees participating in decision-making. This put pressure on the controlling organizations, such as ARMA and MARD, as they needed to monitor performance and allocate funds to individual farms across the country. For this reason, the needs of many smaller agroholdings were neglected, and most of the funds were distributed to wealthier regions and larger farms.

In Ukraine, such a program must not be focused on the wealth of the farms but rather on their needs and destruction, which happened to the rural communities during the period of war. For this reason, a more diversified and less concentrated scheme of control and resource allocation should take place in Ukraine. This might involve the national controlling organizations sending limited resources to different regions of Ukraine, with higher funding for regions with the greatest damage to Agriculture. In this situation, the southern and eastern regions of Ukraine would benefit the most. Next, the regional govern-

ment should allocate resources within the region, with district organizations collecting information on the financial needs of individual farms and passing it to the regional government. In this case, the more complex system with more sub-levels of resource allocation will reflect the needs of individual farms based on their level of damage, not their wealth.

In terms of application strategies, it makes sense to retain the same scheme as in Poland, where individual farms can apply for several or all of the Measures. However, it makes sense to limit the number of applications from Western Ukraine, especially for the least important Measures in the restoration of

Agriculture, such as Measures 6 or 7. The relatively wealthy and less damaged Western part of Ukraine can organize Vocational and Technical training itself without additional funding from abroad. It also makes sense to split some of the Measures into 2 parts to better meet the needs of specific regions. For example, Measure 3: Development and Improvement of Rural Infrastructure can be divided into 2 subsections: development and improvement. The development section should focus only on the regions with agricultural damage, primarily the machinery. Whereas the Improvement Section can be mostly concentrated on the Western parts of Ukraine and the less damaged regions. The Improvement section will not create any new machinery or equipment, but will help modernize the old and inefficient techniques currently in use. This division will help ensure that the modernization of the Agricultural holdings is carried out across all territories. However, the focus is chosen according to the damage to the territories due to the war. In this case, Ukraine will meet 2 of the most important aims of EU integration and the post-war restoration.

Sources for funding in Ukraine:

It is important to understand that if the SAPARD program were used in Ukraine, it would require funding from abroad, as Ukraine is currently unable to cover its rebuilding needs on its own due to the war. Additionally, 75% of SAPARD funding was provided by the EU, so we should also consider it a source for Ukraine.

Recovery, rebuilding, and reconstruction of Ukraine will be largely integrated into the EU accession process.⁹ This means that a significant source of donations would presumably come from the EU, the World Bank, and the EBRD to ensure the formation of a competitive, diversified economy, and these investments for international companies are the most vital to kick-start reconstruction. Additionally, it is important to understand the differences between the situation in Poland and in Ukraine, and to consider that the current financial support provided to Ukraine during wartime is much higher than that provided to Poland during the pre-EU accession period. The organizations mentioned below, and the funding opportunities, illustrate that it is easier to implement the SAPARD methods in Ukraine.

There has been and is significant funding from international organizations that could be used to finance a SAPARD-like program. As part of its 2023 response plan for Ukraine, FAO had budgeted \$205 million to help rural households and small farmers living in the frontline areas. As of December 2024, the

FAO, in partnership with the EU, has provided grants to 237 agricultural producers for the purchase of equipment, green technologies, and infrastructure improvements, totaling USD 2.8 million. At the same time, USAID and the Ministry of Agrarian Policy and Food of Ukraine supplied fertilizers to farms in Ukraine. This is followed by USAID's provision of sunflower seeds for 42,000 hectares of land. The donations are crucial for Ukraine's Agriculture in restoring farm functionality and maintaining them in the first period after the war. The European Bank for Reconstruction and Development (EBRD) has also provided significant assistance to Ukrainian Agriculture and is expected to increase investments to \$3-5 billion. In addition to the global organizations above, there are specific organizations that primarily focus on supporting small agricultural holdings. IFAD (International Fund for Agricultural Development) is an institution that aims to help smallholders affected by the current conflict in Ukraine.^{4,5}

■ Results and Discussion

Results:

The comparative policy analysis helps to understand that SAPARD methods would generally be suitable for the recovery of Ukraine's Agriculture after the war. This is proved by the high correlation between the proposed reconstruction pathways for the Agricultural sector of Ukraine and the methods performed by the SAPARD program in Poland during the pre-EU accession period. Specifically, the most important measures are Measures 1, 2, and 3. They would create workplaces in the agricultural sector, generate profits, and encourage further investment. These measures follow the stated needs of Ukrainian Agriculture, as identified in previous research, namely the restoration and redevelopment of transport infrastructure, the modernization of agricultural equipment, land demining, and increased land productivity, which will lead to intensified trade opportunities, the attraction of a new workforce, and the generation of value added in agricultural production. Measures 4, 5, 6, and 7 would help with EU integration; however, the Environmental measures in Measure 5 can be used in the first stages of the post-war recovery, mainly as part of land demining. These Measures should definitely take place in the development of Ukraine's Agriculture, but at later stages, and not right after the ceasefire. The information on the main benefits and limitations of the SAPARD Measures in Ukraine is summarized in Table 1, while the overall results and findings are in Table 2. Additionally, the research helps to understand the potential sources for the future funding of the SAPARD-like program in Ukraine, which will include FAO, EBRD, and IFAD funds. This proves the idea that a similar program could be implemented in Ukraine with a relatively smaller contribution from the national side and higher international support, compared to Poland.

It is also important for Ukraine to have a slightly different organizational system for the program's success. It is beneficial for the district government to distribute the funds and collect the applications under the guidance of the regional and, later, the national government. This will ensure even opportunities

for larger and smaller farms, but the national government will still be able to direct most of the funds to the most destroyed territories of Ukraine.

Table 1: Main Benefits and Limitations of each of the SAPARD Measures implementation in Ukraine. The table shows that most of the Measures will result in higher productivity and modernization of agricultural production.

Measure	Main Benefit	Main Limitation
Measure 1: Improving the Processing and Marketing of Agricultural and Fishery products.	Increased range of production, increased value-added, and profits could be the sources for land demining	Processing of the Agricultural goods is already on the high level; land mining can limit the positive effect
Measure 2: Investment in Agricultural Holdings	New machinery purchased, old machinery renovated; increased productivity and profitability of the farms, including small-scale holdings	Investments can be used inefficiently due to the high land mining. The needs of the Southern and Eastern Ukraine in development differ from the needs of Western Ukraine in the improvement of the rural infrastructure; profound control and resource distribution are needed
Measure 3: Development and Improvement of Rural Infrastructure	Restoration of the logistic routes and the trade opportunities in the rural areas; attraction of the new workforce; growing trade and higher incomes of the residents	The needs of the Southern and Eastern Ukraine in development differ from the needs of Western Ukraine in the improvement of the rural infrastructure; profound control and resource distribution are needed
Measure 4: Diversification of Economic Activities in the Rural Area	Even higher incomes of the farms	Ukraine already has well-developed and diversified agricultural activities that can be financed internally
Measure 5: Agri-Environmental Measures and Afforestation	Land demining, decreasing level of soil pollution	Does not increase the productivity/profitability of the farms; only suitable for the long-term aims, not the urgent post-war needs.
Measure 6: Vocational Training for beneficiaries and Measure 7: Technical Assistance for beneficiaries.	Better usage of the machinery, higher productivity of agroholdings	Not the most necessary for the post-war reconstruction, EU integration might be limited due to the limited funds.

Table 2: Suitability of SAPARD methods for the recovery of Ukraine's Agriculture. The table shows that Measures 1, 2, and 3 are the most suitable for replication in Ukraine.

Measure of SAPARD	Suitability for Ukraine's Agriculture post-war recovery?	Any other potential benefits of applying this Measure?
Measure 1	High	EU integration
Measure 2	Critical	EU integration
Measure 3	Critical	EU integration
Measure 4	Low	EU integration
Measure 5	Moderate (only for land demining)	EU integration
Measure 6	Low	EU integration
Measure 7	Low	EU integration

Discussion:

After comparing the SAPARD program methods with Ukraine's current agricultural needs, we understand that this strategy will be most useful for Ukraine's post-war recovery, with a simultaneous focus on EU integration, thereby combining 2 ideas into 1 process. Moreover, Ukraine is currently receiving broad support from international organizations (the EU) and private companies (Bayer). It is expected to receive post-war funding for recovery, which would enable the implementation of SAPARD program methods even with smaller investments from national companies. However, there are several things to consider.

First of all, the reconstruction and recovery of Ukraine's Agriculture is a long-term process that requires long-term strategies. The SAPARD program's methods focus on improving the state of Agriculture, not rebuilding it after complete deterioration in some regions of Ukraine. Additionally, agriculture is vital in Ukraine, but it is still less important than human safety. So, the program methods could only occur af-

ter the water and food supplies are restored to the unoccupied regions, the establishment of a network and communication, and the restoration of law and order in Ukraine. Then the first Agriculture-related activity would be land demining, followed by the restoration of full export capabilities through the Black Sea port and railway transportation. Only after this can the methods be implemented, at a minimum, not earlier than 1 year after the ceasefire.

Another point is the drawbacks of SAPARD, which should be considered in Ukraine. It is stated that the largest agrohholdings received the most significant benefits, while small and medium ones received less support. It is crucial not to let this happen in Ukraine. During the war, the larger agrohholdings adapted relatively easily to the circumstances; thus, even with the previously mentioned changes to the organization of the SAPARD Measures in Ukraine, it might still be hard to determine which beneficiaries will benefit the most. In the worst case, it might lead to inequality among rural households across different regions of Ukraine.

■ Conclusion

In this research, we examined whether the SAPARD program methods, previously implemented in Poland during its EU integration in the early 2000s, would be partially beneficial for Ukraine in its post-war recovery. After reviewing the previous research on the primary post-war needs of Ukraine's agriculture and the effectiveness of the SAPARD program in Poland, we conducted a comparative study of the possible implementation of 7 different Measures used by SAPARD into Ukraine's agricultural economy.

The results show that 3 Measures: Measure 1: Improving the Processing and Marketing of Agricultural and Fishery products, Measure 2: Investment in Agricultural holdings, Measure 3: Development and Improvement of Rural Infrastructure would be beneficial for the improvement of the productivity of the farms, the modernization of the equipment and implementation of the technologies, land demining, and rebuilding the transportation links. Measures 4, 5, 6, and 7 are primarily associated with Ukraine's integration into the EU and can only be used in the later stages of Ukraine's rebuilding. Additionally, for the program to be beneficial in Ukraine, the organizational differences, including less centralized governance and a focus on the most damaged regions, should be implemented.

Although the program would have some important differences from the SAPARD in Poland, including the timing and priority of several measures, focus on the regions with the most significant need for implementation, and the equality of all of the beneficiaries, we suggest that the SAPARD program methods would be a valuable and helpful addition to rebuilding Ukraine's Agriculture after the war. Future research might include evaluating the effectiveness and urgency of SAPARD methods across regions of Ukraine. Additionally, reliable financial sources should be identified, and a detailed implementation plan for each Measure should be developed. The pilot programs might be beneficial for further testing.

■ Acknowledgments

We express our specific gratitude to Professor Georgios Aivaliotis and mentor Daryn Howland for supporting us throughout the research process, teaching, and assisting us with this work. We are also thankful to the IRIS research team for the additional support throughout.

■ References

1. Broyaka, A.; Dankevych, V.; Dodd, E.; Welsh, C. *Blueprint for an Agricultural Recovery Plan for Ukraine*; Center for Strategic and International Studies: Washington, DC, 2025. <https://www.jstor.org/stable/resrep70828> (accessed May 17, 2026).
2. Bryła, P. *The Role of SAPARD in Stimulating Entrepreneurship among Food-Processing Firms in the Lodz Region*, 2005. https://www.researchgate.net/publication/23510081_The_Impact_of_SAPARD_on_the_Behaviour_of_Farms_and_Food-Processing_Enterprises_in_the_Lodz_Region (accessed May 17, 2026).
3. CEMA. *Rebuilding Ukraine's Agriculture after the Full-Scale War: A Humanitarian and Economic Imperative*; European Agricultural Machinery Association: Brussels, 2023. https://www.cema-agri.org/images/publications/position-papers/CEMA-Rebuilding_Ukraines_Agriculture_after_the_War-Policy_Paper-2023-08.pdf (accessed May 17, 2026).
4. Gagalyuk, T. *Financing of Resilience and Reconstruction of the Agricultural Sector of Ukraine by International Financial Institutions and Development Agencies*, 2024. https://www.apd-ukraine.de/fileadmin/user_upload/APD_Taras_Gagalyuk_ENG.pdf (accessed May 17, 2026).
5. Kalina, I.; Shkolenko, O.; Shulyar, N.; Kosmidailo, I.; Palii, S.; Panchenko, O. Directions of Financing the Needs of Rebuilding the Agricultural Sector of Ukraine. *Finansy, Kredyt, Działalność* **2024**. <https://fkf.net.ua/index.php/fkd/article/view/4301> (accessed May 17, 2026).
6. Kotytkova, O.; Babysh, M.; Nadvynychnyy, S.; Pohorielova, O. Agriculture in Ukraine: Regional and Global Impacts of the War. *European Countryside* **2025**. <https://doi.org/10.2478/euco-2025-0011>.
7. Matteus, D.; Hazners, J.; Kovacs, K.; Stoian, M.; Georgieva, M.; Cerna, P.; Grosse, T. *SAPARD Review in Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Poland and Romania: Impact Analysis of Agriculture and Rural Development*, 2005. <https://cps.ceu.edu/publications/joint-publications/sapard-review> (accessed May 17, 2026).
8. Nivievskyi, O.; Martyshev, P.; Kvasha, S. Agricultural Policy in Ukraine. *arXiv* **2023**, arXiv:2305.01478. <https://doi.org/10.48550/arXiv.2305.01478>.
9. Nivievskyi, O.; von Cramon-Taubadel, S. *Rebuilding Ukraine: The Agricultural Perspective*, 2023. <https://www.ifo.de/DocDL/econpol-forum-2023-2-cramon-taubadel-nivievskyi-agricultural-perspective.pdf> (accessed May 17, 2026).
10. Oczkowska, M.; Myck, M. *FREE Policy Network Brief Series #AcademicsStandWithUkraine*, 2025. https://freepolicybriefs.org/wp-content/uploads/2025/02/20250220_boxes-komprimerad.pdf (accessed May 17, 2026).
11. Petrenko, O. *The Impact of the Full-Scale War on Agricultural Performance in Ukraine*, 2025. https://kse.ua/wp-content/uploads/2025/06/Petrenko-Oleksandr-BE25_-THE-IMPACT-OF-THE-FULL-SCALE-WAR-ON-AGRICULTURAL-PERFORMANCE-IN-UKRAINE.pdf (accessed May 17, 2026).
12. Warsaw Enterprise Institute. *Ukrainian Path to the European Union: Polish Experience – Agricultural Sector*, 2024. <https://wei.org.pl/wp-content/uploads/2024/11/Ukrainian-path-to-the-Europe->

an-Union.-Polish-experience.-Agricultural-sector.pdf (accessed May 17, 2026).

13. World Bank; Government of Ukraine; European Union; United Nations. *Ukraine – Fourth Rapid Damage and Needs Assessment (RDNA4): February 2022 – December 2024*; World Bank Group: Washington, DC, 2025. <http://documents.worldbank.org/curated/en/099022025114040022> (accessed May 17, 2026).

■ Author

Sofia Yanchuk is a Year 12 student at Queen Anne's School who decided to conduct the research to contribute to Ukraine's post-war recovery. Sofia is interested in Economics and Geography, a participant in the International Geography Olympiad. She is a dancer, a leader of the school government, and a volunteer.