# **SCIENTIFIC HORIZONS**

Journal homepage: https://sciencehorizon.com.ua Scientific Horizons, 27(12), 128-141



## The impact of state policy on the development of organic agriculture in Azerbaijan

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### Article's History:

Received:01.06.2024Revised:03.11.2024Accepted:27.11.2024

**Abstract**. The purpose of this study was to analyse the impact of government policy on the development of organic agriculture in Azerbaijan and to assess the effectiveness of support programmes for organic farmers. The methodology included an analysis of legislative documents, government support programmes for farmers, and reports of state and international organizations. The study found that organic agriculture in Azerbaijan is actively supported through legislative initiatives, such as the Law of the Republic of Azerbaijan No. 650-IIIQ "On Ecologically Clean Agriculture", adopted in 2008, and government support programmes. The law prohibits the use of genetically

### Suggested Citation:

Aliyeva, M., Tanriverdiyeva G., Faradjova, D., Ahmadova, E., & Baranovska, O. (2024). The impact of state policy on the development of organic agriculture in Azerbaijan. *Scientific Horizons*, 27(12), 128-141. doi: 10.48077/scihor12.2024.128.



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modified organisms and chemicals, and sets standards for the certification of organic products. As of 2020, the area of certified organic land was 40,779 hectares, indicating significant potential for the sector. The Azerbaijan 2020: Looking to the Future programme provides financial support to farmers by providing subsidies for fertilizers, seeds and other inputs that contribute to the development of organic production. In 2021-2022, AZN 61.8 million was paid to support agriculture. The study also identified significant challenges, including high certification costs, limited access to modern technologies and low demand for organic products in the domestic market, where only 15% of organic goods are sold. According to forecasts, with increased government support, the area of organic land could reach 500,000 hectares by 2030, which would help increase exports and improve the competitiveness of organic products in international markets. Further development also requires improving infrastructure and creating new sales channels for organic products

**Keywords:** government programmes; agricultural sector; subsidies; environmentally friendly production methods; certification

### INTRODUCTION

Organic agriculture, which is characterized by environmentally friendly production methods, is an important component of sustainable development, contributing to the conservation of biodiversity, improving soil quality and reducing the use of chemical fertilizers and pesticides. In the context of global climate change and increased interest in environmentally responsible production methods, the development of organic agriculture is becoming particularly relevant for Azerbaijan. In a country with rich natural resources and agricultural traditions, organic farming can not only become a new vector of development, but also contribute to economic diversification. However, the adoption of organic methods faces numerous barriers, which are mainly economic and institutional in nature. These include high costs of product certification, limited markets, and a lack of adequate infrastructure for the production and distribution of organic products. In view of this, the government plays a key role in facilitating the transition to organic agriculture through subsidies, grants, tax breaks and legislative regulation.

The development of organic agriculture is becoming increasingly important around the world, including Azerbaijan, where the environmental and economic benefits of this approach are particularly relevant. According to a study by A. Guliyeva and M. Lis (2020), organic agricultural organizations in Azerbaijan face a number of challenges, including high certification costs, insufficient government support, and limited domestic demand for organic products. At the same time, the authors emphasize that the transition to organic methods can improve product quality, expand export potential and contribute to the country's economic growth. This study demonstrates the need for a more structured approach to supporting the organic sector in Azerbaijan, taking into account the experience of other countries that have successfully integrated organic practices into national development strategies.

Forecasts and prospects for the development of the organic products market were studied by A. Proshchalykina *et al.* (2019), who point to the increased interest of consumers in environmentally friendly products in response to global environmental threats. The study by K. Todorova and D. Nikolov (2023) analyses the challenges and opportunities for Bulgaria in the context of the sustainable intensification approach to agriculture, which is part of the EU's Common Agricultural Policy. The author considers the potential benefits that Bulgaria can gain by adhering to the principles of sustainable intensification agriculture, including environmental support, increased resource efficiency and rural development, and provides information on how one of the EU countries is adapting to the requirements of sustainable agriculture, which are similar to those implemented in Azerbaijan for organic production.

Organic agriculture is becoming increasingly popular globally due to its environmental and socio-economic benefits (Stepanenko *et al.*, 2023). Research by G. Ondrasek et al. (2023) highlights that organic agriculture is an effective response to the challenges of the modern agricultural sector, including soil degradation, biodiversity loss and dependence on synthetic chemicals. The authors emphasize that environmentally friendly production methods can help restore soil and maintain a stable ecosystem, while ensuring food security. The experience of different countries, including Poland, shows that organic farming can stimulate local economies and attract investment, but its development requires significant government support, in particular through subsidies and tax breaks (Antczak, 2024). At the same time, the issues of food security and the environmental impact of organic farming remain the subject of active research. N.P. George and J.G. Ray (2023) note that although organic methods often require more resources, they can have a positive impact on ecosystem conservation and contribute to long-term food security. A.M.K. Ghanem et al. (2024) also point out that organic agriculture has several environmental benefits, such as reduced greenhouse gas emissions and increased organic carbon content in the soil.

In Azerbaijan, the development of the organic sector can help solve a number of environmental prob-

lems and increase the competitiveness of local producers on international markets. However, to achieve sustainable development, broad government support is needed, including through subsidies, grants, and tax breaks (Huseynov et al., 2023). Given the environmental and economic benefits of organic farming, some studies show that it could be an effective solution to overcome the current problems of agriculture in Azerbaijan. A. Hashimova (2023) notes that the main challenges are limited infrastructure, high certification costs, and lack of awareness of modern technologies among farmers. Similar problems arise in neighbouring countries, such as Kazakhstan, where organic agriculture is considered a key element of food security, as emphasized by A. Duisenbekuly et al. (2024). In Azerbaijan, the transition to organic production methods can increase food security and stability of the agricultural sector, but only if a targeted state policy is implemented to overcome these challenges.

The importance of organic agriculture is growing in the scientific discourse, but most studies focus on economic benefits and environmental aspects, while farmers' needs for support at the local level are often overlooked. This study fills the gap in the existing literature by focusing on the analysis of local policies and support instruments that can serve as a model for other countries with similar conditions for the development of organic farming. The aim of this study is to assess the effectiveness of political and economic support instruments aimed at developing organic agriculture in Azerbaijan, and to identify key factors that facilitate or constrain the development of this sector.

### MATERIALS AND METHODS

The research methodology involved a comprehensive approach to studying the impact of state policy on the development of organic agriculture in Azerbaijan. The study covered the period from 2019 to 2023 and included a detailed analysis of official regulations and reports of governmental and international organizations, such as legislative documents of the official website of the Food and Agriculture Organization of the United Nations (2024), Organization for Economic Co-operation and Development (n.d.), and the World Bank (2024).

In particular, the legal documents governing agricultural policy were examined, such as the Law of the Republic of Azerbaijan No. 650-IIIQ (2008), which prohibits the use of genetically modified organisms and chemical fertilizers in the production of organic products. To study financial mechanisms to support farmers, authors used official data from the Agribusiness Association (A new sustainable..., 2011). The study examined subsidy programmes that provide payments to farmers based on the area of land under cultivation, as well as special subsidies for the development of perennial plantations and intensive horticulture. The analysis also covered subsidies for product certification, including support for farms certified to international standards. In addition, grants for the purchase of organic fertilizers and seed were considered. In particular, the Enhancing Resilience in Agriculture programme supports small and medium-sized farmers by providing grants for organic certification and the purchase of organic fertilizers, as well as guidance on certification standards that ensure compliance with environmental standards in production (Food and Agriculture..., 2024). The main governing document regulating organic certification standards is the Law of the Republic of Azerbaijan No. 650-IIIQ (2008).

In the course of the study, a comparative analysis of policies and programmes supporting organic agriculture in the EU was carried out, in particular, in Germany – the German Organic Act (Bio-Siegel) (Federal Ministry of Food and Agriculture, n.d.), France – the national Ambition Bio programme (Ministry of Agriculture and Food Sovereignty, 2024) and Poland – the Rural Development Programme (Agency for Restructuring..., 2014). These programmes provide comprehensive support for organic agriculture in the form of subsidies, tax benefits, training programmes and certification services, which contributes to their effective development and creates conditions for the implementation of successful models in Azerbaijan.

To ensure a representative analysis, various sources of information were used, covering both the regulatory and practical framework. Data processing was carried out using electronic databases and information systematization tools such as Microsoft Excel. The tools helped to structure data on certified organic land, exports and retail sales.

### **RESULTS AND DISCUSSION**

### State support mechanisms:

### subsidies, tax benefits, training programmes

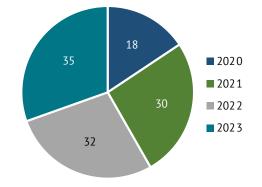
In Azerbaijan, the development of organic agriculture is actively supported by government initiatives and international projects aimed at increasing the sustainability of the agricultural sector. The main legislative act, the Law of the Republic of Azerbaijan No. 650-IIIQ (2008), defines the legal framework for organic production and covers standards for growing plants and keeping environmentally friendly livestock. The law prohibits the use of genetically modified organisms and chemicals for product processing, and sets requirements for certification and environmental labelling of products.

Some programmes provide financial assistance for product certification and the purchase of organic fertilizers, as well as scientific support for organic production, which promotes research and the adoption of environmental practices. Organizations such as the Ganja Agribusiness Association are actively involved in training farmers (A new sustainable..., 2011). Ganja Agribusiness Association has also established a certification body, AZEKOSERT, which promotes organic production standards. In addition, government-supported courses in organic agriculture management have been introduced at the Azerbaijan State Agrarian University (Aliyev *et al.*, 2022). Development strategies are supported by international organizations, including Food and Agriculture Organization of the United Nations, which helps to harmonize national standards with international norms. These initiatives contribute to environmental protec-

These initiatives contribute to environmental protection, food security and the development of rural communities. Thanks to the implementation of these policy decisions, organic agriculture in Azerbaijan is developing, although the sector still needs to overcome barriers related to education and infrastructure modernization.

The programme Azerbaijan 2020 provides for subsidies to support the agricultural sector (Food and Agriculture..., 2019). They include subsidies for the purchase of seeds, fertilizers, agricultural machinery and direct payments for the area under cultivation. These measures are aimed at increasing agricultural productivity and encouraging the adoption of environmentally friendly practices. The Azerbaijani government provides significant subsidies to farmers, which plays a critical role in encouraging agricultural production, including organic production. Farmers receive direct financial support based on the area they cultivate. For example, farmers are paid AZN 40 per hectare per year, with additional payments for specific crops such as wheat and rice. These subsidies are intended to reduce the financial burden on farmers and encourage the adoption of more sustainable agricultural practices.

According to recent data, particularly in 2022-2023, several types of subsidies were introduced to support farmers in establishing new perennial plantations, developing intensive horticulture, and installing irrigation systems. According to the Agricultural Credit and Development Agency, approximately AZN 61.8 million was paid to farmers in the 2021/2022 season (Fig. 1). The subsidies covered almost 300,000 hectares of land, and the main costs included fertilizers, seeds, and plant protection products. A subsidy of AZN 200 manats/ha was also provided for sowing (for some crops such as corn, sunflower, soybeans, potatoes, etc.). Farmers who plant intensive orchards with drip irrigation also receive significant subsidies: for intensive and semi-intensive orchards such as nuts, a subsidy of 700 manats/ ha is provided for the first 4 years, then this amount is reduced to 240 manats/ha; a one-time subsidy for planting fruit orchards ranging from 4,400 to 11,000 manats/ha depending on the type of crop (e.g., zeytuns, citrus, nut plantations).



**Figure 1**. Subsidies for organic agriculture in Azerbaijan (2020-2023), mln **Source:** compiled by the authors based on the Food and Agriculture Organisation of the United Nations (2024)

Such subsidies are intended to reduce the cost of new plantings and help farmers avoid additional costs for water and crop care. For example, in 2023, payments to support autumn agriculture were increased, including additional incentives for farmers who cultivate land for organic farming. These measures help to increase the competitiveness of Azerbaijani agriculture both domestically and internationally, as new plantations, especially those using intensive technologies, require significant initial investment.

Tax incentives for agricultural producers further stimulate investment in organic agriculture. The main benefits include: exemption from value-added tax for agricultural producers on major products, including organic products. This eases the financial burden on farmers and allows them to invest more in improving production. Preferential income tax rates applied to agricultural enterprises, encouraging investment in the development of organic farming and sustainable agriculture. Incentives for farmers who adopt organic production methods, including special rates for property and land used for organic farming. These incentives help to create an enabling environment for farmers, easing their financial situation in an environment where investments in organic practices can be costly but bring long-term benefits. Table 1 provides a structured overview of the state support and key aspects of organic agriculture in Azerbaijan. It illustrates the main measures, including legislative initiatives, subsidies provided, area of certified land, exports, and other important indicators that demonstrate the impact of government policy on sustainable agriculture in the country.

| Table 1. State support for organic agriculture |   |   |   |  |  |
|--|---|---|---|--|--|
| Year   | Type of support                         | Amount or volume  | Description   |  |  |
| 2008   | Legal framework                         | N/A Law of the Republic of Azerbaijan No. 650-IIIQ (2008) was<br>introduced to regulate organic practices |   |  |  |
| 2015   | Training centre in Qakh                 | N/A   | The Regional Centre for Experimental Agriculture was<br>established to support organic farming in the region    |  |  |
| 2020   | Certified organic land                  | 40,779 ha   | The total area of organically certified land, including agriculture and wild collection                         |  |  |
| 2021   | Export of organic products              | Around 60,000 tonnes of<br>hazelnuts  | Hazelnuts are one of the main organic export crops, exported to 25 countries                                    |  |  |
| 2022   | Subsidies and grants for<br>agriculture | 587 million USD   | Support, including subsidies for food security and support for organic farming                                  |  |  |
| 2022   | Retail sales of organic<br>products     | 3 million euros   | Retail sales of organic products, which indicates the potential of the domestic market and the need for exports |  |  |

Source: compiled by the authors based on H. Gengenbach et al. (2020)

The information presented here highlights the government's efforts to strengthen the organic sector through subsidies, legal frameworks and training programmes for farmers. Law of the Republic of Azerbaijan No. 650-IIIQ (2008), laid down the legal framework for organic production, providing basic requirements and standards for the development of this sector. The legislation aims to regulate organic practices that reduce harmful environmental impacts and promote the production of high-quality organic products. In 2020, about 40,779 hectares of land were certified for organic production in Azerbaijan. This area includes both agricultural land and areas for the collection of wild plants. This indicates a significant potential for the development of organic production, although the area remains limited across the country. In 2022, the Azerbaijani government has allocated approximately USD 587 million to support agriculture, including subsidies for food security, irrigation system development, and other measures to promote sustainable organic production. This funding aims to improve farmers' access to inputs and help them adapt to environmentally friendly practices. Exports of organic products, in particular hazelnuts, play an important role in Azerbaijan's agriculture. In 2021, about 60,000 tonnes of hazelnuts were exported to 25 countries, highlighting the international demand for organic products and the importance of government support for exports. In 2022, retail sales of organic products in the domestic market of Azerbaijan reached 3 million euros. This demonstrates the demand for organic products among local consumers, but also points to the need to develop exports due to the limited domestic market. In 2015, the Regional Centre for Experimental Agriculture was established in the Qakh region. This centre supports farmers in adopting organic practices by providing them with access to training programmes and advice on environmentally friendly technologies. Legislation, subsidies, educational programmes and export incentives create the conditions for the expansion of the organic sector, providing long-term economic and environmental benefits for the country.

Grants. The Enhancing Resilience in Agriculture programme in Azerbaijan aims to support small and medium-sized farmers by providing grants for the purchase of organic fertilizers and certification for organic production (Organisation for Economic..., n.d.). This initiative is designed to strengthen the climate resilience of the country's agriculture in response to the challenges of climate change. The main objectives of the programme include reducing dependence on chemical fertilizers and promoting sustainable farming practices. In line with the World Bank (2024) policy framework, the programme supports so-called Climate-Smart Agriculture by providing farmers with resources to improve soil quality and increase yields using environmentally friendly technologies. The programme aligns with national sustainable agriculture goals by providing financial assistance for the purchase of organic fertilizers and certification, allowing farmers to officially label their products as organic. In addition, the programme works with international and local partners to implement sustainable agricultural practices in vulnerable regions of Azerbaijan.

A joint grant project of Food and Agriculture Organization of the United Nations (2024) and Turkey. This initiative is aimed at developing organic agriculture and institutional capacity in Azerbaijan. The project is aimed at strengthening the legal framework, conducting training programmes for farmers and organizing study tours to Turkey for Azerbaijani specialists. An Organic Agriculture Documentation Centre has also been established, providing access to international databases and materials for the development of farmers' knowledge. This project is funded by Turkey and implemented by Food and Agriculture Organization of the United Nations with a budget of USD 300,000, and has been operating since 2015.

Training and research programmes. Organic agriculture in Azerbaijan is actively supported by training programmes organized in cooperation with international organizations such as Food and Agriculture Organization of the United Nations. These programmes contribute to raising awareness among farmers and expanding their knowledge of organic farming practices, including sustainable tillage, resource management and product certification. The Ganja Agribusiness Association (A new sustainable, 2011), together with Food and Agriculture Organization of the United Nations (2024), organized practical trainings for farmers focused on the application of organic standards and preparation for international markets, in particular the EU.

These programmes educated farmers about the value of organic certification, natural resource management and reducing dependence on chemical fertilizers. In addition, attention was paid to preparing for compliance with European standards for organic products, which increases export opportunities for local producers. The organic agriculture development projects have attracted resources to support scientific research to help farmers adapt international standards to local conditions. For example, research covers topics such as restoring soil fertility and increasing yields, which allows for the integration of environmentally friendly methods into the country's conventional agricultural practices. These research enhancement and support programmes are creating favourable conditions for the development of the organic sector in Azerbaijan, contributing to food security and strengthening the economic potential of the agricultural sector.

# Problems and challenges of organic agriculture in Azerbaijan

Despite the support mechanisms in place, organic agriculture in Azerbaijan faces a number of serious problems and challenges. The main barriers for farmers seeking to adopt organic methods include high certification costs, lack of access to innovative technologies and knowledge, and limited markets for organic products. It is worth having a closer look at these challenges.

Certification is a key step for farmers who want to enter the organic market. However, the cost of this process can be significant. According to Food and Agriculture Organisation of the United Nations (2024), the cost of certification of an organic farm in Azerbaijan can range from AZN 2,000 to AZN 5,000 depending on the volume of production and the requirements of certification bodies: farmers can spend up to 10% of their annual income on the certification process alone, which is a significant financial burden, especially for small farms.

Main provisions of certification standards. Ban on the use of genetically modified organisms: Law of the Republic of Azerbaijan No. 650-IIIQ (2008), which defines the basic standards for organic production and certification, clearly prohibits the use of genetically modified organisms in the production of organic products. Control over the use of chemicals. The use of synthetic fertilizers and pesticides is prohibited: products must be grown using natural plant protection products and fertilizers. Certification and labelling: products that meet organic standards must be certified and labelled. This ensures that products meet environmental requirements and allows consumers to choose organic products with confidence.

The certification of organic products in Azerbaijan is carried out by certification bodies such as AZEKOS-ERT, which was established on the initiative of the Ganja Agribusiness Association (A new sustainable..., 2011). AZEKOSERT is guided by international standards, such as those of the International Federation of Organic Agriculture, to ensure that products meet national and international requirements. The main stages of certification are: application by the farmer for product certification; assessment and verification of production for compliance with environmental standards, including soil, plant protection system and animal welfare; and issuance of the certificate. Products receive a certificate if they meet the established standards and can be labelled as organic.

The problem of access to modern technologies and knowledge in the field of organic agriculture is a serious barrier for farmers in Azerbaijan (Maharramova & Maharramov, 2023). Local producers face limited opportunities to learn the latest organic methods due to several reasons, including a lack of educational programmes and a lack of technical support for training farmers. This significantly hinders the development of organic production in the country. Limited state support for training and access to information: according to the 2022 national survey, about 65% of farmers said they did not receive adequate support from the state in terms of training in the latest agricultural technologies and access to information on innovative methods. In particular, farmers note insufficient funding for seminars, lack of advisory centres, and limited access to international resources on organic farming.

Insufficient number of research and extension centres. In Azerbaijan, agricultural research institutions are still only partially integrated with local farmers. This results in limited access to new knowledge for farmers, who are not always able to engage in practical research or receive advice on the implementation of modern organic farming methods. The government should invest in research and advisory centres that would provide farmers with new knowledge and raise their awareness of organic farming methods. Information also remains inaccessible to many farmers due to the lack of digital learning platforms that could provide ongoing access to modern technologies and practices. Digital tools such as mobile applications, online courses and experience-sharing platforms can greatly simplify the learning process and improve the efficiency of organic farming (Abdullayev et al., 2024a). According to the Food and Agriculture Organization of the United Nations (2024), such platforms can increase productivity by up to 20% by providing access to information on fertilizers, crop optimization and water management.

Thus, investments in the development of educational programmes, the establishment of advisory centres, the integration of research and the introduction of digital learning platforms are critical to improving farmers' access to innovative methods in organic farming. Limited markets for organic products in Azerbaijan. One of the biggest challenges for organic agriculture in Azerbaijan is the limited opportunities for marketing. This is due to both infrastructure barriers and weak demand for organic products among the local population. Due to the lack of efficient distribution channels and underdeveloped infrastructure, many farmers face difficulties in selling their organic products. Demand for organic products in the domestic market remains low, which creates constraints for farmers seeking to sell their products domestically. Only 15% of organic products produced in Azerbaijan are sold on the domestic market. This is due to the relatively high price of organic products compared to conventional products, which makes them less affordable for many consumers.

Infrastructure is one of the main barriers to the development of organic markets (Guliyeva, 2023). The lack of logistics centres, limited availability of cold storage and specialized storage facilities for organic products significantly complicates the transportation and storage of goods. A study conducted by the Food and Agriculture Organization of the United Nations (2024) shows that about 30% of all agricultural products are lost due to insufficient infrastructure. This increases the risks for farmers and hinders their potential to expand production. Azerbaijani farmers also face problems accessing international markets. Although the country has the potential to export organic products to the EU and other regions with high demand for organic products, the process of entering these markets remains difficult. The main barriers include high requirements for certification and standardization, which require significant investments from producers. According to experts, only about 10% of farmers in the country have sufficient resources to certify their products in accordance with European standards, which limits export opportunities (Organisation for Economic..., n.d.).

Efficient distribution channels that could facilitate the distribution of organic products are also limited. The absence of cooperatives or distribution companies specializing in organic products reduces farmers' ability to organize stable sales. The Azerbaijani government should consider establishing public or private distribution centres to provide logistical and marketing support to farmers. In order to overcome these barriers, it is recommended to increase state support for the creation of new marketing channels and to increase investments in the development of infrastructure for transport and storage. Investments in the creation of specialized cooperatives for organic farmers could significantly facilitate access to markets and improve sales (Lopatynskyi *et al.*, 2023). Another important step would be to promote certification of products in accordance with international standards, which would provide access to European markets and open up new export opportunities.

The need for infrastructure development. The poor state of roads and transport infrastructure affects the competitiveness of farmers. A study by the Food and Agriculture Organization of the United Nations (2024) highlights that improved transport routes can reduce the cost of transporting agricultural products by up to 30%. In Azerbaijan, a large proportion of agricultural producers are located in remote areas where transport costs are high, making it difficult to market products, especially organic ones. This limits access to major trading centres and export markets, making products more expensive and less competitive. Investments in these areas will not only help reduce costs for farmers, but also open up new opportunities to expand markets, improve product quality and increase farmers' incomes.

### Comparison of support programmes in Azerbaijan, Germany, France, and Poland and prospects for the development of organic agriculture in Azerbaijan

A comparison of state support programmes for organic agriculture in Azerbaijan and leading programmes in other countries, such as Germany, France and Poland, shows different approaches to stimulating sustainable agricultural development. The Azerbaijani government actively supports the development of organic agriculture, including through subsidies, tax breaks and grants. Law of the Republic of Azerbaijan No. 650-IIIQ (2008) regulates organic production standards, including certification and environmental labelling of products. The state also provides subsidies for farmers who cultivate land using organic methods and finances training programmes in cooperation with international organizations such as the Food and Agriculture Organization of the United Nations (2024). However, the main challenges for Azerbaijan remain the limited domestic market for organic products and the underdeveloped infrastructure.

Germany has one of the strongest support systems for organic agriculture in the EU. The Bio-Siegel Organic Agriculture and Labelling Act has been in force since 2001 and provides for strict standards for organic products (Federal Ministry of Food and Agriculture, n.d.). The support programme includes direct payments to organic farmers and additional payments for the implementation of environmentally friendly practices, and finances research and promotion of organic products on the market, in particular through large support programmes. In contrast to Azerbaijan, where the market is still developing, Germany has a strong culture of organic consumption, which stimulates demand and provides additional opportunities for farmers (Poyoi *et al.*, 2022).

The national programme Ambition Bio, established in France, aims to achieve 15% of organic land and increase the share of organic products in public procurement (Ministry of Agriculture and Food Sovereignty, 2024). The programme includes comprehensive financial support for farmers through subsidies, tax breaks and loans for the development of infrastructure for organic production. The government also supports the promotion of French organic products on the domestic and international markets. Ambition Bio provides both infrastructure and marketing support for farmers, which increases the competitiveness of French organic products. Compared to Azerbaijan, France has a developed network of domestic distributors and significant public investment in exports.

The Polish Rural Development Programme covers the period until 2027 and is part of the EU's Common

Agricultural Policy (Agency for Restructuring..., 2014). It encompasses support for the transition to organic agriculture, subsidies for organic producers, and training programmes for farmers. Special attention is paid to developing market opportunities and promoting Polish organic products abroad. Unlike Azerbaijan, Poland has access to EU funds, which significantly increases investment in the sector and allows it to create favourable conditions for producers, in particular through subsidies for agricultural modernisation. A comparative analysis shows that while Azerbaijan actively supports the development of the organic sector, it lacks the level of infrastructure and financial support available in the EU (Table 2).

| Table 2. Comparative analysis of support programmes |   |   |  |  |  |
|---|---|---|--|--|--|
| Country   | Main support measures                                       | Features  | Problems and challenges                        |  |  |
| Azerbaijan  | Subsidies, tax breaks, training programmes                  | Support programmes through Food and<br>Agriculture Organization of the United<br>Nations, underdeveloped infrastructure | Limited markets, high cost of certification    |  |  |
| Germany   | Bio-Siegel, direct payments                                 | Developed domestic market, high culture of<br>organic food consumption  | High cost for small farmers                    |  |  |
| France  | Ambition Bio, subsidies, loans                              | Export promotion, support through public<br>procurement   | Market expansion,<br>international competition |  |  |
| Poland  | Rural Development Programme, subsidies, training programmes | Access to EU funds, stimulating modernization   | Dependence on EU funding                       |  |  |

*Source:* compiled by the authors

The use of international experience, in particular the French Ambition Bio programme (Ministry of Agriculture and Food Sovereignty, 2024) and the Polish Rural Development Programme (Agency for Restructuring..., 2014), can help modernise the organic sector in Azerbaijan and ensure its sustainable development. The organic agricultural sector in Azerbaijan has significant prospects for development, especially if there is stable government support, integration with international markets and compliance with quality standards that meet the requirements of the EU and other countries with high demand for organic products. Based on assessments and forecasts of the organic sector, and taking into account the international context, the key trends and opportunities for its expansion are presented.

Growth forecasts under stable government support. The conditions for the development of organic agriculture are improving due to increased government support and funding for farmers seeking to work according to organic standards (Smolii & Mostoviak, 2024). According to the Ministry of Agriculture of Azerbaijan, in 2021-2023, government spending on organic agriculture increased by 18%, allowing farmers to cover the costs of certification and environmentally friendly technologies (Food and Agriculture..., 2024). If government support grows by 15-20% annually, the total area of land used for organic farming could increase to 500,000 hectares by 2030, which would be about 5% of the country's total agricultural land. This trend will have a positive impact on the production of organic products and will allow Azerbaijan to increase its exports to the EU, where demand for organic products is growing by 10-12% annually.

The impact of international standards and integration with international markets. Azerbaijan is actively working to bring its organic production standards in line with international norms. This is especially important for EU markets, where consumers prefer certified organic products. According to a report by the European Commission, the organic market in the EU is estimated at around 45 billion euros per year, and this figure is growing, which opens up significant prospects for Azerbaijani exporters (Organisation for Economic..., n.d.). To access EU markets, Azerbaijani farmers can use certification in accordance with EU standards. For example, in 2023, more than 200 Azerbaijani farms were registered as having received certification that met international requirements, allowing them to enter new export markets. In addition, Azerbaijan is interested in cooperating with the EU in the field of organic agriculture. As part of the Eastern Partnership programme, the EU provides advice and financial support to local farmers who adopt organic practices. In addition to EU markets, there is a growing demand for organic products in Asian countries such as China, Japan, and South Korea. For example, in China, the organic market is estimated to be worth approximately USD 10 billion, and is growing at 15% annually (World Bank, 2024). This demand creates

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potential opportunities for the export of Azerbaijani organic products to Asian countries, especially given their geographical proximity and Azerbaijan's participation in transport corridors connecting Europe and Asia.

Additional perspectives. Investing in improving the infrastructure needed to store and transport organic products will also have a positive impact on export potential. The World Bank estimates that proper infrastructure for the organic sector could increase exports by 20-30% in the next 5-7 years. In addition, the development of modern logistics centres at the country's borders will significantly reduce the time for delivery of products to the EU and Asian markets, which is important for the competitiveness of Azerbaijani organic products (Abdullayev et al., 2024b). The findings of the study confirm that support for organic agriculture through government subsidies, grants, and tax breaks is a significant factor in encouraging farmers to switch to organic production methods. This is consistent with the findings of A. Agasalim (2020), who believes that direct government support is the basis for agricultural development, but only if it is complemented by access to innovation and modern technology. This study also emphasizes the importance of combining financial assistance with educational programmes to enable farmers to adopt more efficiently, environmentally sustainable production methods.

The results also indicate that expanding educational programmes for farmers is a critical step in overcoming barriers to organic production. This is in line with the position of M. Gulaliyev *et al.* (2019), who emphasize the importance of educational initiatives as a means of raising farmers' awareness and adapting them to new methods. In this context, the lack of access to knowledge and infrastructure makes it difficult for farmers to adapt to organic standards, which was also noted by M. Huseynov (2023), who points out the weak institutional support for innovation in the agricultural sector of Azerbaijan.

This study also found that successful implementation of organic farming requires cooperation among farmers, as high certification costs can limit individual farms from achieving organic production standards. The experience described by M. Galstyan *et al.* (2024) on the example of Armenia shows that the creation of cooperatives helps to reduce financial and administrative burdens for farmers. This opens up prospects for further research on the possibility of adapting cooperative models in Azerbaijan, which will allow small farmers to overcome financial barriers more easily. In addition, I. Khalilov and F. Jafarova (2022) highlight the importance of infrastructure to support organic agriculture in the regions of Karabakh and East Zangezur, where transport and storage issues are becoming barriers to the development of the agricultural sector. This study notes that similar infrastructure constraints may reduce the competitiveness of organic products on international markets.

The findings of this study highlight the importance of a comprehensive approach for the development of organic agriculture in Azerbaijan, where government support, access to finance and farmer education play a key role. It emphasizes the importance of financial instruments, such as subsidies and tax incentives, to facilitate the transition to organic production. This correlates with the findings of M. Agnoletti and Santoro (2022), who point out the importance of international cooperation and value chain analysis. They note that in Azerbaijan, the lack of efficient logistics and infrastructure for organic products is one of the main obstacles to agricultural development. These findings are consistent with the present study, which highlights the need to develop infrastructure, in particular for certification and transportation of organic products, to ensure their competitiveness on international markets.

At the same time, the results of the study by A. Ukalska-Jaruga *et al.* (2020) on soil contamination by persistent organic pollutants point to serious environmental barriers to organic farming in Azerbaijan. It is noted that contaminated soils can significantly limit the potential for organic production, as organic products have strict requirements for environmental standards. This issue is also mentioned in the study, which states that one of the main obstacles to the development of organic agriculture in the country is soil contamination and insufficient attention to environmental aspects of production. This highlights the importance of preserving natural resources and monitoring soil conditions as a prerequisite for the development of the organic sector.

In terms of general trends, studies by L. Cei *et al.* (2024) and H. Willer *et al.* (2023) show a steady increase in demand for organic products at the global level. In particular, the reports by L. Cei *et al.* and H. Willer *et al.* state that organic agriculture is showing positive dynamics in global markets, and organic products are becoming increasingly essential for food security. These trends are also consistent with the results of this study, which notes the importance of developing the organic sector to improve Azerbaijan's export potential: expanding markets for organic products can contribute to economic growth and increase the country's competitiveness at the global level.

Similarly, R. McGuire *et al.* (2022) emphasize that organic farming is an important tool for combating climate change, as this approach allows reducing greenhouse gas emissions and contributes to the restoration of biodiversity. This is also supported by this study, which states that the development of organic agriculture can have a positive impact on the environmental situation in the country, in particular by reducing the use of chemical fertilizers and pesticides. At the same time, the results of the study by S. Mirloo *et al.* (2021), which analyses the problems of organic agriculture in Western Azerbaijan, confirm the need to improve educational initiatives for farmers. They point to the importance of improving farmers' skills and raising their awareness of organic methods. This is in line with the study, which emphasizes the importance of training programmes and increasing farmers' knowledge for a successful transition to organic production methods; more educational initiatives are needed to help farmers not only learn organic methods, but also to learn how to properly certify their products to enter international markets.

The findings of this study confirm the importance of developing organic agriculture in Azerbaijan as one of the priority areas for ensuring sustainable development of the agricultural sector. In the work by N. Okruashvili et al. (2023), the authors discuss the role of organic farming as part of the strategy for sustainable agricultural development in Georgia. Similar to the results obtained, the authors point to the need to integrate organic farming into national strategies, as it contributes to food security and economic stability. In the context of Azerbaijan, these findings are also relevant, as organic agriculture can significantly increase the country's export potential and ensure the sustainable development of rural communities. The study by B.L. Lakaria et al. (2022) discusses the prospects of organic farming in terms of reducing the impact of pesticides and chemical fertilizers. This is in line with the results of the study, which emphasizes the importance of the environmental benefits of organic agriculture, in particular in reducing soil and water pollution. However, on the way to implementing organic practices, it remains important to address the problem of soil pollution and ensure proper monitoring of soil quality, which was also noted in the study by K. Ukalska-Jaruga *et al.* (2020).

The work of N. Sirenko *et al.* (2019) points out the importance of adapting organic production to market conditions and competitiveness in global markets. This issue is also critical for Azerbaijan, where the development of the organic sector requires improving farmers' access to certification and creating effective sales channels for organic products. The results confirm that one of the main constraints for the development of organic agriculture in Azerbaijan is the limited access to international markets and the need to raise awareness among farmers about the requirements for organic products. The study of R. Al-Obaidy (2019) focuses on the challenges faced by organic agriculture, in particular, the problems of certification and standardization of products. This correlates with the results obtained, which indicate that high certification costs are one of the main obstacles to the development of the organic sector in Azerbaijan. Solving this problem requires both government support and the development of international partnerships to ensure access to technologies and knowledge that can reduce certification costs.

In general, the results of this study are consistent with the findings of R. Abbasov *et al.* (2019) about the need to expand educational programmes for farmers. The results of M. Navidi *et al.* (2024) support authors'

conclusion that it is important to develop management skills and strategic planning for organic agriculture to compete successfully with conventional methods. Finally, the environmental data of A. Behnami *et al.* (2023) confirm the need for government programmes that would eliminate residual pollution and help restore ecological balance, which is key to maintaining environmental sustainability in the region.

### CONCLUSIONS

The study found that organic agriculture in Azerbaijan is actively supported through legislative initiatives, subsidies, grants and farmer training programmes, which provides potential for further development of the sector. Law of the Republic of Azerbaijan No. 650-IIIQ, adopted in 2008, establishes the legal framework for organic production and regulates certification requirements. The certification procedure for organic products in Azerbaijan is carried out by AZEKOSERT, which was established on the initiative of Ganja Agribusiness Association; the main provisions of the certification are: prohibition of the use of genetically modified organisms, control over the use of chemicals and labelling of products that meet organic standards.

As of 2020, the area of certified organic land in Azerbaijan is 40,779 hectares, which is a significant, albeit limited, result for the country. Since 2016, subsidies have been introduced with the support of national strategies such as the National Strategy for the Development of Agriculture, including support for certification, purchase of organic fertilizers and investment in research to develop environmentally friendly practices. It is important to note that since 2021, USD 587 million has been allocated to support the agricultural sector under the Azerbaijan 2020: Looking to the Future programme, which has helped cover the cost of fertilizers, seeds and crop protection products, including for organic production. According to the Agrarian Credit and Development Agency, in the 2021/2022 season alone, farmers were paid AZN 61.8 million, which covered almost 300,000 hectares of land. Subsidies for intensive orchards and irrigation significantly reduce costs for farmers, facilitating the adoption of modern organic methods.

Support programmes, such as Enhancing Resilience in Agriculture in Azerbaijan, provide support to small and medium-sized farmers through grants for the purchase of organic fertilizers and certification for organic production. The joint support programme of Turkey and Food and Agriculture Organization of the United Nations for Azerbaijan aims not only to develop organic agriculture, but also the country's institutional capacity. Quantitative data, including volumes of exported organic products, indicate a growing potential for exports, particularly of hazelnuts, with a volume of 60,000 tonnes in 2021, opening up new markets, especially in the EU. Despite this, however, there are serious barriers to the development of organic agriculture, including high certification costs (up to AZN 5,000 per farm), limited access to innovative technologies, lack of digital training platforms, and insufficient infrastructure for storage and transportation. Given these constraints, only 15% of organic products are sold on the domestic market, suggesting that additional measures are needed to develop marketing and improve market infrastructure.

Comparison of state programmes to support organic agriculture in Azerbaijan with those of Germany, France, and Poland shows that, even with active support for the development of the organic sector in Azerbaijan, it lacks the level of infrastructure and financial support available in the EU. The study shows that in order to overcome these barriers, it is necessary to continue investing in infrastructure, establishing cooperatives to facilitate access to markets, and increasing subsidies for organic farmers. Given the existing demand for organic products in the EU and Asia, the potential for export expansion is significant, but requires improved certification and the development of export channels. Further growth of the organic market in Azerbaijan is possible through integration with international standards and active participation in global supply chains.

One of the main limitations of this study is the limited amount of information available on specific support programmes for organic agriculture in Azerbaijan, in particular on their effectiveness and practical implementation at the farm level. While much general data on policy and economic initiatives were available, specific data on the impact of these measures on organic farmers were often not presented in sufficient detail in public reports. In addition, the study does not cover a wide range of regional differences, which may have a significant impact on the adaptation of organic farming in different parts of the country. Another limitation is the lack of specific data on the long-term economic impact of organic agriculture on farmers' incomes, which could help assess the effectiveness of state support and identify potential policy gaps.

A promising area for further work is to compare the results of organic farming in different regions of Azerbaijan, as the level of infrastructure development and access to resources can vary significantly depending on the area. This will allow to more accurately identify the needs and barriers for farmers in different parts of the country. Also, taking into account the positive experience of other countries such as Georgia or Poland, further research could focus on adapting organic farming models that have been successful in these countries to the conditions of Azerbaijan. This would help to develop specific recommendations for integrating the organic sector into the country's overall agricultural policy.

### ACKNOWLEDGEMENTS

None.

None.

### **CONFLICT OF INTEREST**

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### Вплив державної політики на розвиток органічного сільського господарства в Азербайджані

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Анотація. Метою цього дослідження було проаналізувати вплив державної політики на розвиток органічного сільського господарства в Азербайджані та оцінити ефективність програм підтримки органічних фермерів. Методологія дослідження включала аналіз законодавчих документів, державних програм підтримки фермерів, а також звітів державних і міжнародних організацій. Дослідження показало, що органічне сільське господарство в Азербайджані активно підтримується за допомогою законодавчих ініціатив, таких як Закон Азербайджанської Республіки № 650-IIIQ «Про екологічно чисте сільське господарство», прийнятий у 2008 році, та державних програм підтримки. Закон забороняє використання генетично модифікованих організмів і хімікатів, а також встановлює стандарти для сертифікації органічної продукції. Станом на 2020 рік площа сертифікованих органічних земель становила 40 779 га, що свідчить про значний потенціал сектору. Програма «Азербайджан 2020: Погляд у майбутнє» надає фінансову підтримку фермерам шляхом надання субсидій на добрива, насіння та інші засоби виробництва, що сприяють розвитку органічного виробництва. У 2021-2022 роках на підтримку сільського господарства було виплачено 61,8 млн манатів. Дослідження також виявило значні виклики, серед яких високі витрати на сертифікацію, обмежений доступ до сучасних технологій та низький попит на органічну продукцію на внутрішньому ринку, де продається лише 15 % органічних товарів. За прогнозами, за умови посилення державної підтримки площа органічних земель може досягти 500 000 га до 2030 року, що сприятиме збільшенню експорту та підвищенню конкурентоспроможності органічної продукції на міжнародних ринках. Подальший розвиток також потребує покращення інфраструктури та створення нових каналів збуту органічної продукції

**Ключові слова:** державні програми; аграрний сектор; субсидії; екологічно чисті методи виробництва; сертифікація