

SUSTAINABLE DEVELOPMENT OF AGRICULTURE IN AZERBAIJAN AND UKRAINE IN THE AGE OF DIGITALIZATION

Turkan Sheydai¹, Nurana Abdullayeva², Oleh Yatsiuk³

^{1,2} Azerbaijan State Oil and Industry University, Baku, Azerbaijan

³ Ivano-Frankivsk National Technical University Oil and Gas, Ivano-Frankivsk, Ukraine

¹ turkan.sheydai@asoiu.edu.az, <http://orcid.org/0000-0002-2106-7883>

² nuranabdn@gmail.com, <http://orcid.org/0000-0001-6379-0853>

³ olegstya@gmail.com, <http://orcid.org/0000-0002-3943-7352>

ABSTRACT

The article shows the necessity of applying scientifically efficient technologies and expanding innovative activities to ensure the sustainable development of agriculture. As it is known, the term agriculture means the process of production of plant and animal products, improvement of their quality and effectiveness, protection of these products under suitable conditions, development and evaluation and putting them on sale.

Agriculture is one of the sectors that form part of the economy of every country, including Azerbaijan and Ukraine. The importance of new generation technologies in accelerating the innovative development of the agricultural sector is explained. State support for agriculture, including the practice of subsidizing this field, has now become a crucial element of the global agricultural system.

This article examines the theoretical aspects of the issue of state support to agriculture and analyzes the international experience in this field. State support measures for agriculture in Azerbaijan and Ukraine, especially direct subsidies, were systematically analyzed and the efficiency of this support was evaluated based on various indicators..

Keywords: Agriculture, Sustainable Development, Innovation, Technology, Digitalization, Indicator.

Introduction

Nowadays, science, science-intensive technologies and active innovative activity should be the main driving force of agriculture. According to the general development concept of modern agriculture, the main place should be given to scientific approaches in the construction of highly productive agroecosystems and preservation of ecological safety. In order to ensure the production of food products that will meet the current and future demands of the growing population in the context of global climate changes, serious scientific research is being conducted in the developed countries of the world with the application of digital and genomic technologies. In order to ensure the sustainable development of agriculture and food security of the population in Azerbaijan [1-3].

A free trade regime operates between Ukraine and Azerbaijan. Thus, Ukraine is considering the possibility of creating logistics centers for the supply of tropical fruits from Azerbaijan. There are many opportunities for the creation of regional logistics centers for the supply of dates, figs, citrus fruits, as well as walnuts and hazelnuts from Azerbaijan to Ukraine. Also, joint tourism

between the countries can be developed. Even if we look at the months of January-November 2015, according to the statistics of the Azerbaijan State Customs Committee, the turnover of goods between Ukraine and Azerbaijan amounted to 302.47 million dollars. 283.65 million of them are imported from Ukraine [4;5].

At the same time Azerbaijan had a 63% share in Ukraine's oil and crude oil imports. This is reflected in the statistics of the State Customs Service of Ukraine. During this period, Azerbaijan exported 216.16 million US dollars of crude oil to Ukraine with a 62.68% share in Ukraine's oil imports. The United States accounted for 24.08% of imports and exported \$83.05 million worth of crude oil to the country during this period. Libya, as a country with a 13.21% share, exported \$45.56 million worth of crude oil to Ukraine. It was noted that during January-October 2020, compared to the corresponding period of 2019, Ukraine increased the import of oil and crude oil by 1.7 times or 438.33 thousand tons, reaching 1.05 million tons. During the corresponding period, the country imported crude oil in the amount of 344.85 million US dollars. This is 9.3% more than in January-October 2019 [6].

Today, the world's companies compete with each other to take advantage of a growing industry focused on reducing emissions in agriculture. But first of all, they have to prove that it is profitable to focus on agricultural fields in the current era. Looking ahead to the 21st century, farming in the modern agricultural industry is grappling with many increasingly complex challenges. These problems include: global food security, environmental pollution, Farmers today face a variety of challenges that fundamentally test the sustainability of modern agriculture, such as: depletion of valuable resources, degradation of agricultural land and underestimation of its potential, demographic changes, conversion of rural land for urban development, erosion and rupture of soil particles due to natural forces etc. can be attributed. As the backbone of humanity's food supply, farmers must adapt to change while innovating to overcome these barriers. At the same time, by implementing sustainable farming practices, new technologies, and partnering with policyholders in our communities, work must begin to create a more robust agricultural sector that benefits everyone.

Scientific Results

Indicators of Agriculture of Azerbaijan and Ukraine

The development of agricultural industries in Ukraine and Azerbaijan is aimed at achieving an optimal balance between three components – economic, social and environmental. The transition to sustainable development leads to a change in the value orientations of many countries. The internationally recognized fundamental values of sustainable development are freedom, equality, solidarity, tolerance, respect for nature, joint responsibility. The national goals of development are based on the political, economic, social, ecological, moral and cultural values specific to the society of Azerbaijan and Ukraine. They focus the strategy on taking care of the common welfare and protecting the national interests of both countries.

The main directions defined in the Sustainable Development Strategy are as follows (Fig. 1).



Fig. 1. Sustainable Development Strategy.

Source: Compiled by authors.

When we say development, we mean ensuring sustainable development of the country, carrying out structural reforms, ensuring economic growth in an ecologically sustainable manner, and creating favorable conditions for economic activity. Security is ensuring the safety of the state, business and citizens, the security of investments and private property, the protection of peace and borders, the provision of fair and impartial justice, the immediate cleansing of power at all levels and the implementation of effective anti-corruption mechanisms. The priority here is the safety of human life and health, which is impossible without an effective system of public health protection, provision of appropriate medical services, protection of socially vulnerable sections of the population, safe environment and high-level health facilities. Responsibility means ensuring access to high ranks to every citizen, regardless of race, skin color, political, religious and other beliefs, gender, ethnic and social origin, property status, place of residence, language or other characteristics.

The main task of agriculture is to produce food at a high level, ensuring food security, meeting the growing demand and adhering to the principles of sustainable development. Therefore, solutions aimed at the sustainable development of agricultural activity should be focused on increasing the efficiency of resource use. The growth of agricultural production is significant. Despite the sharp decrease in the number of farmers, especially in developed countries, crop production has increased significantly. The agro-industrial sector and the food industry, which are of particular importance in Ukraine and Azerbaijan, which are developing countries, occupy a key place in the world economy. This is why investment in agriculture has recently become one of the best contributors to economic growth, food security and poverty reduction. Although food production has increased in recent years, excessive use of non-renewable resources or agrochemicals has caused considerable damage to the environment. With the application of innovative technologies, advanced knowledge, and modern and updated farm management techniques, today's farmers are able to maintain high productivity while protecting the environment. Today, scientists already admit that the sustainable development of the agro-industrial sector is an important element of "green" development. In modern times, in the context of global sustainable development, agriculture plays a leading role in developed and developing countries. The agroindustrial sector is the world's largest labor force. It also contributes more to global land use. The downside is that it endangers soils and is responsible for about a quarter of the world's greenhouse gas emissions. On the other hand, it is an important area for global food security and is vulnerable to climate change. Statistics show that global food production will increase by about 70% in the next generation. Of course, this indicator should be achieved using the same land area and less water. Climate change, energy challenges and the degradation of agricultural land complicate the task. Many agricultural development companies are developing a comprehensive agronomic knowledge base to support sustainable agricultural development [7-9;10].

As the main contribution to the sustainable development of agriculture, they consider increasing its productivity as the highest goal, and increasing food production on existing agricultural land plays a decisive role in preventing global warming and the loss of biodiversity. These companies are developing plant nutrition concepts to reduce the carbon footprint of mineral fertilizers and thus agriculture. They advise farmers on how to apply the right product in the right amount at the right time and organize various trainings. Companies are also promoting resource efficiency through stakeholder dialogue and business partnerships to impact productivity, food

security and climate change mitigation. In accordance with the generally accepted approach to sustainable development, Ukrainian agriculture is based on the following three principles (Fig. 2).

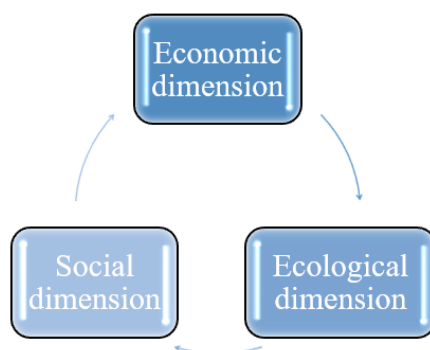


Fig. 2. Principles of agriculture.

Source: Compiled by authors.

By the economic dimension, it means that agricultural fields provide financial rewards to farmers, give them a decent life, efficient cultivation of crops and environmental protection. The ecological dimension means that agriculture minimizes the use of non-renewable resources, increases depleted resources, and protects the environment and natural resources. Regarding the third principle, the social dimension, agriculture contributes to the well-being and vitality of local communities, their economic and social development, including the provision of healthy food.

International Trade Relations of Ukraine and Azerbaijan with Other Countries

Looking at Ukraine's agriculture, the planting of winter crops for 2023 was almost completed in mid-November, and about 4.1 million hectares of winter wheat were planted in government-controlled areas. In 2021, before the start of the war, about 6.1 million were planted in the entire country. up to hectare of winter wheat was planted. The 2023 corn crop, the most economically important grain, was planted on nearly 4 million hectares, compared to 4.2 million hectares planted in 2022. Land in some parts of the country has been shifted from cereals to more profitable oil crops. As a result of the smaller acreage, the 2023 wheat crop in government-held areas is estimated at 18.5 million tons, about 8 percent below the already war-torn 2022 crop.

Tables and graphs of export and import operations of Azerbaijan and Ukraine with other countries for 2023 are shown below in Tables 1-4. It should be noted that the figures are estimated in US dollars.

Table 1. Azerbaijan export by countries.

Name of countries	Thousands of US dollar
Total	17 967 952.61
including:	
Italy	8 363 512.05
Turkey	2 768 968.74
Greece	800 464.43
Spain	652 920.01
Israel	635 358.47
Russia	621 134.88
India	612 142.39
Czechia	427 444.65
Romania	413 189.23

Georgia	406 695.14
Germany	372 451.01
Ireland	316 999.99
Bulgaria	184 568.72
Croatia	180 278.65
Austria	152 802.55
Other countries	1 059 021.70

If we look at the export potential of Azerbaijan in 2023, it can be seen that 47% of the export operations are with Italy. In second place, Turkey carried out 15% export operations. It is clear from the fact that the name of Ukraine is not mentioned in the table that there are few export operations between Azerbaijan and Ukraine in 2023 (Fig. 3).

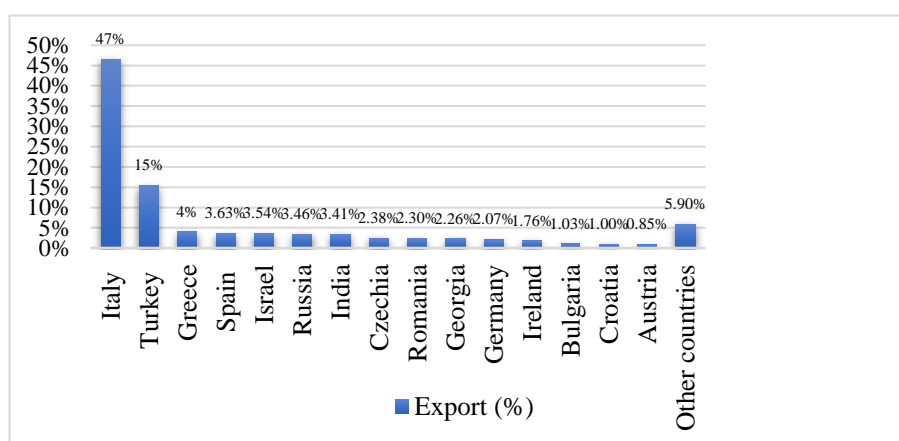


Fig. 3. Azerbaijan export by countries (%).

Source: Compiled by authors.

Table 2. Azerbaijan import by countries.

Name of countries	Thousands of US dollar
Total	8 198 460.06
including:	
Russia	1 543 427.96
China	1 266 160.89
Turkey	1 147 121.77
Germany	482 652.68
Turkmenistan	439 039.67
France	290 972.31
United States of America	247 122.38
Islamic Republic of Iran	238 120.23
Italy	216 309.46
Japan	200 059.98
Korean Republic	190 838.60
Kazakhstan	157 970.40
Belarus	154 676.50
Great Britain	145 138.51
Ukraine	118 781.33
Other countries	1 360 067.38

Source: Compiled by authors.

If we look at the import potential of Azerbaijan in 2023, it can be seen that 18.83% of the import operations are with Russia. In second place, 15.44% of import transactions were with China. In 2023, the import operations between Azerbaijan and Ukraine amounted to 1.00%, which is based on agricultural products (timber, semi-finished furniture, etc.) (Fig. 4).

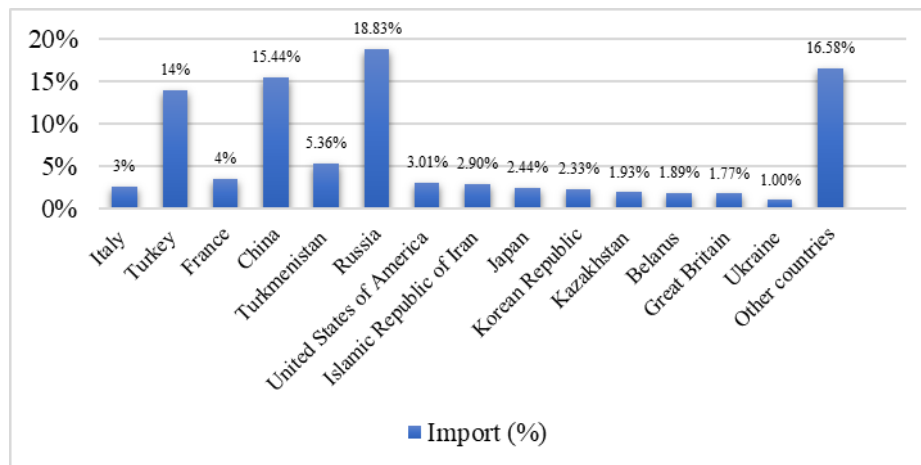


Fig. 4. Azerbaijan import by countries (%).

Source: Compiled by authors.

Table 3. Ukraine export by countries.

Name of countries	Thousands of US dollar
including:	
<u>Azerbaijan</u>	2,167.7
China	303,618.3
Poland	31,875.0
Turkey	14,265.9
Russia	32,935.8
Italy	59,587.8
Germany	141,988.6
India	38,450.0
<u>Netherlands</u>	70,731.8
<u>Egypt</u>	3,209.0
<u>Spain</u>	32,607.3
<u>Hungary</u>	14,479.5
<u>United States</u>	170,015.0
<u>Romania</u>	8,895.4
<u>Belarus</u>	3,557.2
<u>Czech Republic</u>	23,404.0
<u>United Kingdom</u>	46,179.3

Source: <https://www.ceicdata.com/en/indicator/ukraine/total-exports>

If we look at the export potential of Ukraine in 2023, it can be seen that China is in the first place with \$303,618.3. In the second place, it carried out export transactions with the United States of \$170,015.0. In 2023, export operations between Ukraine and Azerbaijan amounted to \$2,167.7 [11-13].

Table 4. Ukraine import by countries.

Name of countries	Thousands of US dollar
including:	
Azerbaijan	1,638.4
China	228,278.0
Germany	119,506.7
Russia	22,203.9
Poland	31,437.3
Belarus	3,870.3
United States	257,907.0
Turkey	17,684.5
Italy	55,381.4
France	59,931.9
Switzerland	26,632.3
Hungary	12,872.6
Czech Republic	20,169.1
Lithuania	4,052.0
Japan	66,635.2
United Kingdom	69,901.3

Source: <https://tradingeconomics.com/ukraine/imports-by-country>

If we look at the import potential of Ukraine in 2023, it can be seen that the United States of America is in the first place with \$257,907.0. In the second place, it carried out import operations with China for \$228,278.0. In 2023, import operations between Ukraine and Azerbaijan amounted to \$1,638.4.

Export volume of corn worldwide in 2023/2024 (Fig. 5) shows that shows that Ukraine is a significant player in the grain market and ranks fourth in the world after Brazil, the USA and Argentina [14].

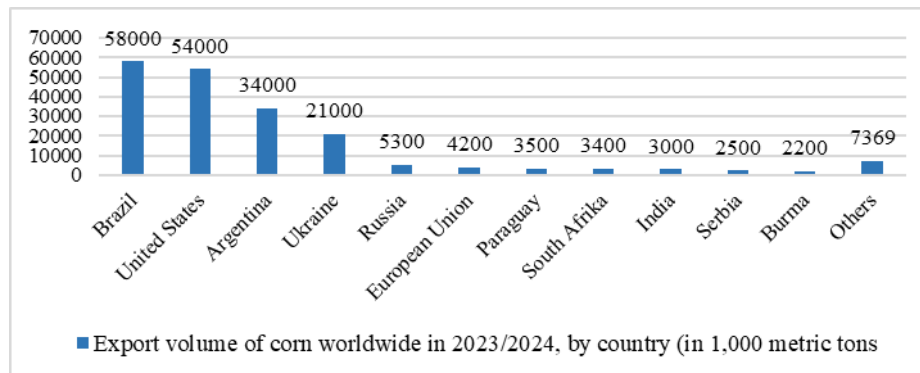


Fig. 5. Export volume of corn worldwide in 2023/2024, by country (in 1,000 metric tons).

Source: <https://www.statista.com/statistics/254299/top-global-corn-exporters/>

Corn export in Ukraine in 2023 was 26 million tons. This is 23% of the total volume of export of agricultural products of Ukraine. The income from the sale of corn reached 4.9 billion dollars (see fig.5). It should be noted that China remains the main importer of Ukrainian corn. Last year, the share of exports to this country was almost 22% and the value was slightly more than 1 billion dollars, they exported more than in 2022, but received almost the same amount. Later, due to the closure of sea routes, the share of exports to China was 17%, and the income was \$1 billion. However, in 2021, China imported more than 30% of Ukrainian corn for \$1.9 billion. Spain and Romania were also among the top three cultural importers last year. These countries bought 13.7% and 11.5% of 2023 corn exports for a total of \$1.2 billion [15].

Conclusion and suggestions

The strategic vision of the sustainable development of Ukraine and Azerbaijan is based on ensuring the national interests and fulfilling the international obligations of both countries regarding the transition to sustainable development. The implementation of the Development Strategy of the countries is aimed at eliminating poverty through effective employment of the population, high cost of labor, accumulation of human and social capital, development of entrepreneurial activity of the population, strengthening of the middle class, improvement of social standards and guarantees. In modern times, such development can include the following:

1. taking measures to eliminate the imbalance in the economic, social and environmental fields;
2. transition to "green economy" principles and transformation of economic activity;
3. ensuring the establishment of a peaceful and secure, socially united society with proper governance and inclusive institutions;
4. organization and provision of partnership mutual activity of state authorities, local self-government bodies, business, science, education and civil society organizations;
5. create conditions for full employment of the population;
6. achieving a high level of science, education and healthcare;
7. to create conditions for the environment to be in the right condition, which will ensure the quality of life and well-being of the present and future generations;
8. determination of directions for the centralization and implementation of regional policy that ensures the combination of national and regional interests;
9. protection of national cultural values and traditions across countries.

A decisive factor in the Development Strategy of both countries is the active use of knowledge and scientific achievements, the creation of a favorable investment environment, the renewal of production funds, the stimulation of innovative activities, high-tech activities and sectors of the economy, increasing the energy efficiency of production, the use of renewable energy sources, environmentally safe production. and aimed at stimulating balanced economic growth based on the attraction of investments in "green" technologies.

The economic growth of both countries will be realized not by the exploitation of natural resources, but by the wide application of "green" economic models. Thus, waste accumulated over the years will be gradually processed and disposed of, which will lead to a reduction in scale and elimination of a large number of landfills. In exports, there will be a shift from raw materials and their primary processing products to the predominance of products with high added value. On the other hand, the energy intensity of GDP will be significantly reduced due to the implementation of energy-saving measures and energy-saving practices in both countries. This process will allow

to significantly reduce the release of greenhouse gases and other pollutants into the atmosphere and contribute to the fight against climate change. All this will help improve the quality of the environment and the health of the population for both countries. Finally, it should be noted that sustainable development is primarily aimed at people and improving their quality of life in a favorable socio-economic environment and ecologically clean, healthy, diverse natural environment. As a result, the high intellectual level of human potential should ensure the country's competitiveness in the future.

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RƏQƏMSALLAŞMA ƏSRİNDƏ AZƏRBAYCANDA VƏ UKRAYNADA KƏND TƏSƏRRÜFATININ DAVAMLI İNKİŞAFI

Türkan Şeydai¹, Nuranə Abdullayeva², Oleh Yatsiuk³

^{1,2} Azərbaycan Dövlət Neft və Sənaye Universiteti, Bakı, Azərbaycan

³ İvano-Frankivsk Milli Texniki Neft və Qaz Universiteti, İvano-Frankivsk, Ukrayna

¹ turkan.sheydai@asoiu.edu.az, <http://orcid.org/0000-0002-2106-7883>

² nuranabdn@gmail.com, <http://orcid.org/0000-0001-6379-0853>

³ olegstya@gmail.com, <http://orcid.org/0000-0002-3943-7352>

XÜLASƏ

Məqalədə kənd təsərrüfatının davamlı inkişafının təmin edilməsi üçün elmi cəhətdən səmərəli texnologiyaların tətbiqinin və innovativ fəaliyyətin genişləndirilməsinin zəruriliyi göstərilir. Məlum olduğu kimi, kənd təsərrüfatı termini bitki və heyvan mənşəli məhsulların istehsalı, keyfiyyətinin və səmərəliliyinin yüksəldilməsi, bu məhsulların uyğun şəraitdə mühafizəsi, işlənilib hazırlanması və qiymətləndirilməsi və satışa çıxarılması prosesi deməkdir.

Kənd təsərrüfatı hər bir ölkənin, o cümlədən Azərbaycan və Ukraynanın iqtisadiyyatının bir hissəsini təşkil edən sahələrdən biridir. Kənd təsərrüfatı sektorunun innovativ inkişafının sürətləndirilməsində yeni nəsil texnologiyaların əhəmiyyəti izah edilir. Kənd təsərrüfatına dövlət dəstəyi, o cümlədən bu sahənin subsidiyalaşdırılması praktikası hazırda qlobal kənd təsərrüfatı sisteminin həlledici elementinə çevrilib.

Bu məqalədə kənd təsərrüfatına dövlət dəstəyi məsələsinin nəzəri aspektləri araşdırılır və bu sahədə beynəlxalq təcrübə təhlil edilir. Azərbaycanda və Ukraynada kənd təsərrüfatına dövlət dəstəyi tədbirləri, xüsusilə birbaşa subsidiyalar sistemli şəkildə təhlil edilmiş və bu dəstəyin səmərəliliyi müxtəlif göstəricilər əsasında qiymətləndirilmişdir.

Açar sözlər: kənd təsərrüfatı, davamlı inkişaf, innovasiya, texnologiya, rəqəmsallaşma, göstərici

НЕПРЕРЫВНОЕ РАЗВИТИЕ СЕЛЬСКОГО ХОЗЯЙСТВА В АЗЕРБАЙДЖАНЕ И УКРАИНЕ В ЭПОХУ ЦИФРОВИЗАЦИИ

Тюркан Шейдай¹, Нурана Абдуллаева², Олег Яцюк³

^{1,2} Азербайджанский Государственный Университет Нефти и Промышленности, Баку, Азербайджан

³ Ивано-Франковский национальный технический университет нефти и газа, Ивано-Франковск, Украина

¹ turkan.sheydai@asoiu.edu.az, <http://orcid.org/0000-0002-2106-7883>

² nuranabdn@gmail.com, <http://orcid.org/0000-0001-6379-0853>

³ olegstya@gmail.com, <http://orcid.org/0000-0002-3943-7352>

АБСТРАКТ

В статье показана необходимость применения научно эффективных технологий и расширения инновационной деятельности для обеспечения устойчивого развития сельского хозяйства. Как известно, термин «сельское хозяйство» означает процесс производства, улучшения качества и эффективности продуктов растительного и животного происхождения, сохранение этих продуктов в подходящих условиях, разработку, оценку и маркетинг.

Сельское хозяйство является одним из секторов, которые составляют часть экономики каждой страны, включая Азербайджан и Украину. Объяснена важность технологий нового поколения в ускорении инновационного развития агропромышленного комплекса. Государственная поддержка сельского хозяйства, включая практику субсидирования этой сферы, сегодня стала важнейшим элементом мировой аграрной системы.

В данной статье рассматриваются теоретические аспекты вопроса государственной поддержки сельского хозяйства и анализируется международный опыт в этой сфере. Меры государственной поддержки сельского хозяйства в Азербайджане и Украине, особенно прямые субсидии, систематически анализировались и эффективность этой поддержки оценивалась на основе различных показателей.

Ключевые слова: сельское хозяйство, устойчивое развитие, инновации, технологии, цифровизация, индикатор.