AQRAR TƏDQİQATLAR MƏRKƏZİ

MINISTRY OF AGRICULTURE OF THE REPUBLIC OF AZERBAIJAN

Agricultural Economics Research Center

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Introduction

Agricultural Economics Research Center under the Ministry of Agriculture of the Republic of Azerbaijan was established on the bases of Research Institute for Agricultural Economics acting since 1962.

Research Institute for Agricultural Economics under the Ministry of Agriculture reformulated to Agricultural Economics Research Center with the status of a public legal entity according to the decree of the President of the Republic of Azerbaijan, Ilham Aliyev dated 22 May 2018.

The objective of this institutional reform is to re-shape the research body with 60 years of history into a "Think Tank" to provide the necessary scientific justification and analytical base for further improvement of agricultural policy based on the requirements of the modern stage of agricultural reforms as well as the global challenges in the country.

Currently, the creation process of the Agricultural Economics Research Center continues based on a *new mission, new principles of affairs, new positions, innovative methods, and modern technologies*.

Mission

Our mission is creation of agro database, analysis, evaluation and forecasting, preparation of agricultural policy recommendations, programs, projects and innovative development mechanisms.

Vision

Our vision is to become a "Think Tank" providing necessary scientific and analytical bases in the context of sustainable development of agricultural sector

Principles:

Speed

The process of preparation of scientific substantiations at the center is proceeding at maximum speed in order to provide flexible solutions in accordance with the new stage of the agricultural reforms.

Responsibility

Employees of the center are responsible for conducting scientific and analytical activities in order to ensure development of agriculture within their competences.

Quality

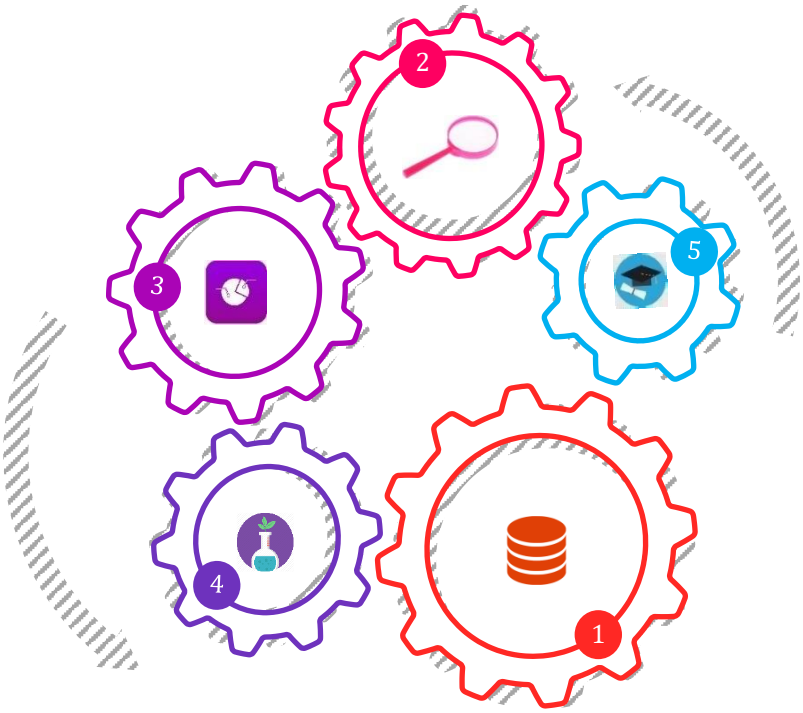
Creation of databases, conducting researches and implementation of analytical activities at the center should provide good basis for decision-making in agricultural policy using innovative methods and modern technologies.

Activity

Agricultural Economics Research Center's mission is creation of agro database, analysis, evaluation and forecasting, preparation of agricultural policy recommendations, programs, projects and innovative development mechanisms. Following the mission, an Action Plan was prepared for 2020 and the Center's activities were organized by that Plan.

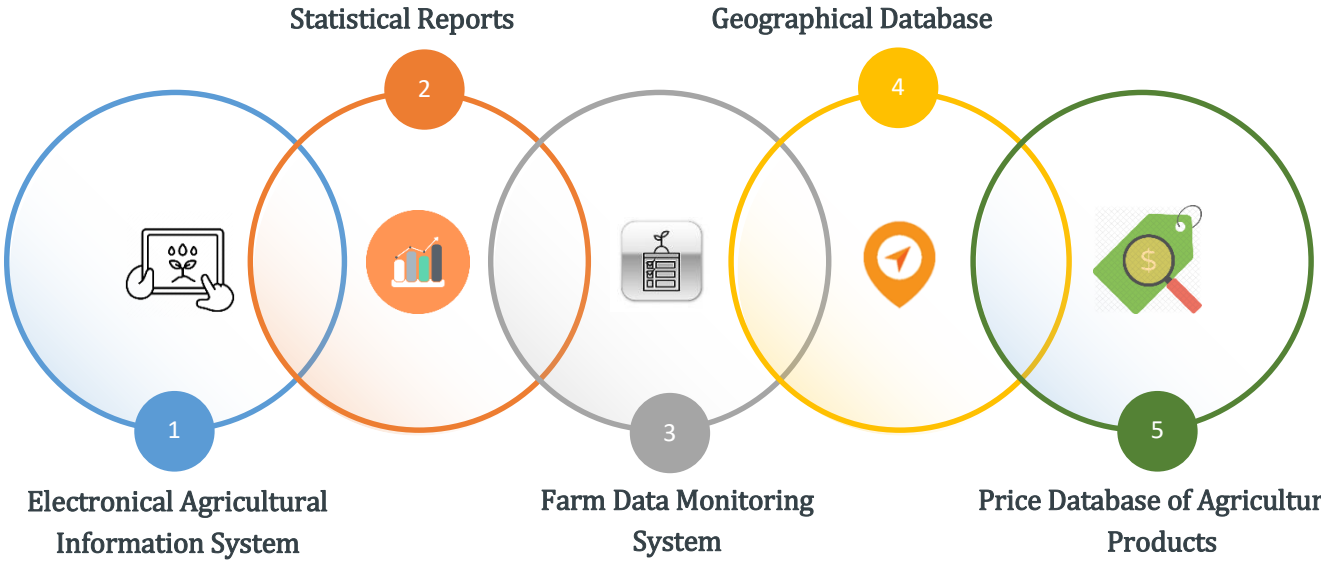
In general, the Center' s activities are grouped under 5 directions:

1. Creation of databases
2. Monitoring and Evaluation
3. Diagnostics and Analysis
4. Scientific researches
5. Doctoral Education



1. Creation of databases

5 subgroup databases are being created in the Center: Data of Electronical Agricultural Information System, Statistical Reports, Farm Data Monitoring System, Geographical Database, Price Database of Agricultural Products.



Electronical Agricultural Information System (EAIS) - is a unique system which includes basic principles of the Ministry of Agriculture of the Azerbaijan Republic (proximity to farmers, transparent and effective management, and application of innovations), provides integration with internal and external systems, and creation of a wide range database for agricultural sector.

EAIS is a transparent and operational management tool, which primarily includes the development of business processes covering all phases of government support measures for agricultural producers.

EAIS - covers all fields of agriculture over time, allowing them to integrate with internal and external systems, as well as build a logical relationship of all agricultural processes, complete processes, analyze and apply modern technical solutions and provide accurate forecasts based on data. At the same time, EAIS plays important information based on all agricultural fields over time and all the processes of regulation, support, and maintenance in these fields, as well as increasing integration with external systems. Thus, there is a potential to collect and create analytical reports and build models that will form the basis for planning future development and become the key requirement of modern data – "Big Data". This can be achieved through the establishment of logical relationships, a comprehensive analysis of all processes related to agriculture, and accurate forecasting.

In 2020, the following works have been done within the framework of EAIS:

1. 545712 farms of 546018 individuals, 1123 farms of 891 legal entities have been registered and a personal cabinet has been created in EAIS from 18.02.2019 till the current time. According to the "Rules for subsidizing the production of agricultural products", to ensure that subsidies are granted to farmers from 1st of January 2020, only through EAIS, a sub-module was developed and put into use in the system to apply for subsidies, farmers made their applications for subsidies by making planting statements on their cabinets. In general, in 2020, 105645 farmers were registered in the system, 62516 farmers' territorial information (land certificate) was input, 318738 farmers made the declaration of planting.
2. Following the "Order on subsidizing the production of agricultural products" approved by Decree No. 759 of the President of the Republic of Azerbaijan dated June 27, 2019, starting from 2020, subsidies to farmers in the field of plant-growing and livestock have been provided only through EAIS without alternatives. To ensure this, the "Bee-garden sub-module" on the livestock module was developed at EAIS. Thus, beekeepers who want to benefit from state support can make subsidy applications quickly and transparently by entering the bee-garden and beehive data into the system without leaving the farm. To check the accuracy of the data, a separate "Bee" monitoring module has been created.
3. At present, along with the farmer registration subsystem under EAIS, "Subsidy", "Supplier", "Government purveyor", "Veterinary", "Monitoring", "Agricultural analytics", "Seed-Ting", "Phytosanitary", "Agricultural Technique", "Laboratory", "Agricultural

Trade", "Agricultural credit", "Agricultural insurance" subsystems are planned to operate. Some of them are full, and some have already been given partial use.

4. In 2020, the subsidies for planting, crop, seed, animal, cocoon, bee were provided through modules of the EAIS subsidy Information System. Also, to ensure the expenditure of a non-cash part of the agricultural subsidy and to include in the system information on the turnover of agricultural production means, supplier modules were put into use to include in the system information on the products supplied for the provision of crop subsidy. The activities of the suppliers carrying out the sale of fertilizer, pesticide, seeds were provided in the system through the subsystem of suppliers. At present, suppliers enter the information about their branches, warehouses, products, and sales to EAIS and benefit from state support through the system.

5. To ensure the accessibility of the subordinated bodies and related departments of the ministry to the information included in the new modules in the EAIS, the "EAIS-reporting system" (ERS) has been created to ensure easy and operative access detailed reports based on the information included in the EAIS.

6. The integration of the Geographical Information System (GIS) formed by the Ministry of Agriculture into the EAIS has been ensured. Through geographic information systems, monitoring facilities have been created through satellite inspections of arable land and perennial plantings.

7. At present, registration of more than 1000 veterinarians, as well as veterinary departments, artificial insemination specialists has been carried out within the EAIS, they have been formalized electronically and opportunities for farmers to register their animals, work is underway to formalize the subsystem of Veterinary Services Monitoring.

Statistical Reports. All statistical data on the agriculture of Azerbaijan are systematized in this database. Also, the data obtained from other institutions of the country have been restructured and grouped by region, product and other categories.

❖ The development of reports covering agricultural statistics, as well as operational data on agricultural production, import, and export of agricultural and food products, statistical data on subsidies in the field of agriculture was continued by the Agricultural Economics Research Center in 2020.

❖ In addition to agricultural statistical data, the databases on subsidies and other state support data, as well as the data collection, structuring, and preparation of visual reports on the activities of the Ministry of Agriculture and subordinate agencies, the distribution of the data to the AgroData statistical portal was continued.

- **Structure of database of AgroData statistical portal:**

Created to implement the acquisition of information on the agricultural sector from a single source, improvements made in the http://agrodata.az/ portal and multi-system functionality have been created for users. In the portal, indicators of agricultural sector are grouped by country and region, systematically structured in groups and subgroups. At the same time, depending on the purpose of use and the purpose of the user, a search system with both direct search and multifunctional filter was created, various loading functions were added in the selected form of data. The system also provides visualization of certain data. The http://agrodata.az/ portal is planned to be completed as a single source covering all statistical data about agricultural sector in 2021.

- **Structuring the database on subsidy information:**

Since 2020, the implementation of subsidy payments on EAIS has created conditions for obtaining and systematization of more detailed information about the farmers. Thus, data on the number of farmers who declared the sowings by regions and villages, farm profiles, as well as data on livestock subsidies were structured and analyzed. It was also possible to obtain data on the distribution of farmers according to gender and age, the level of use of fertilizers and pesticides, fertilizer and seed suppliers. Based on the analysis of all these data, the corresponding changes to the subsidy ratios of 2021 were made.

Farm Data Monitoring System (FDMS) – The data reflecting the impact of agricultural policy on farmers is an important system of indicators for evaluation of efficiency of this policy.

Farm Data Monitoring System (Farm Accountancy Data Network, FADN) which is used at the level of the European Union, is an important data base for the Common Agricultural Policy of the European Union and acts as a necessary tool for decision-making in this field.

Applying FDMS in Europe has a long experience. So, this system first was applied in Norway in 1911, in Finland 1912, in Denmark 1918, in England 1936, in Sweden 1939, in the Netherlands 1940, in Germany 1955, in Luxembourg 1958 and in Austria 1959. By the decision of European Commission, dated on June 15 1965 FDMS is applied at the European Union level.

FDMS in Azerbaijan was launched as part of a project of the Food and Agriculture Organization of the United Nations (FAO) for the first time in the Commonwealth of Independent States (CIS). As part of this project, Agricultural Economics Research Center was designated as responsible executive body. Pilot surveys were conducted on farms in several regions as initial experience. Since 2015, FDMS data collection processes cover all regions of the country. Currently, database of Agricultural Economics Research Center contains reports for 2015–2019.

The selection of farms to be included in the FDMS survey is based on the EAIS database of the Ministry of Agriculture. EAIS-based farms were divided into five layers according to the acreage and products, and a random sampling method was applied. The selected sample number is 1% of each category and meanwhile 1% of subsidized farms. Thus, farms are selected from all groups (from micro to macro) to collect FDMS data. Surveys in the framework of FDMS are conducted by State Centers for Agricultural Development under the Ministry of Agriculture (SCAD). Survey data collected by SCAD is sent directly to the electronic database of the Agricultural Economics Research Center.

Measures have been carried out within the framework of the EU Twinning project to improve FDMS in line with FADN standards. To simplify the survey and improve the quality of the work, the survey questionnaire was updated and improved. In the end, a relevant report will be prepared based on the methods of statistical analysis.

To conduct surveys within the framework of the FDMS for the period of 2020, the selection has been conducted based on an EAIS base and 4000 farms have already been selected for the survey.

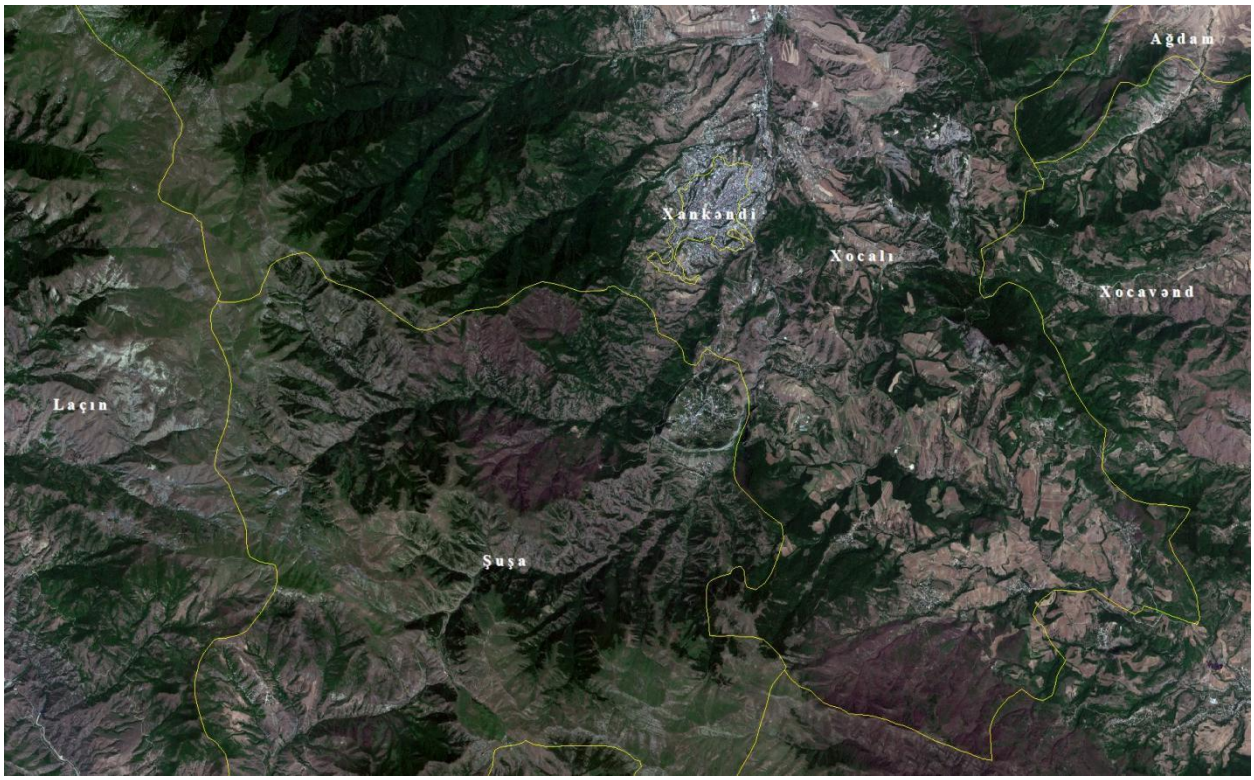
Geographical Database. Geographic Information Systems (GIS) is an information system that provides collection, processing, storage, transmission, cartographic and visual presentation of spatially coordinated information.

The "AgroGIS" geodatabase of the Ministry of Agriculture is managed by Agricultural Economics Research Center. The structure of this database includes the results of photo interpretation on orthophoto maps for actual use of agricultural lands, as well as the land of other designated lands, category-changed lands, lands of economic and administrative regions, administrative-territorial units and municipalities, lands of subordinate bodies of the Ministry of Agriculture, buildings, spatial and non-spatial data on perennial plantings and greenhouses, all watersheds, as well as statistics of orthophoto maps and a digital model of relief and non-spatial data.

- In 2020, the Geographical data department of the Center compiled separate maps of melons, vegetable, cotton, grain plants, perennial plants, yard areas, meliorated areas, sowing areas with water pumps, groundwater level, salinization areas, as well as sowings of about 100 fruits and vegetable plants. Also in 2019, the application of specialization maps for other plants was carried out.

- Within the framework of the work done to restore agriculture in the occupied territories immediately after the liberation of our lands in 2020, the actual map of the sowings and perennial plantings was drawn up based on satellite images and the statistical report on the districts was prepared in the Nagorno-Karabakh region. Also, the names, locations, and codes of the villages having been under occupation was updated in the Electronic Agricultural Information System (EAIS).

- In the reporting year, new information on agricultural lands was obtained from the State Service on Property Issues under the Ministry of Economy and these data were added to the EAIS database and integrated with the existing base.



- According to satellite images, monitoring of planting data on spring and autumn sowings was carried out for subsidies based on EAIS data, the work was started on the preparation of web portal, which will reflect the results of monitoring. The initial database was built in this direction and the results of the monitoring were included. The results of monitoring of perennial sowings that were checked and registered in the territory were corrected using satellite images of different years, re-inspection of the areas that were sent from the State Agricultural Development centers (SCAD), as well as from the Internal control and audit department of the Ministry of Agriculture was carried out, maps were drawn and reports were prepared.

- The appointment of enterprises under the Ministry of Agriculture in 2020, the actual use, the availability of communal services, suitability for operation, etc. the database has been processed. The part of the attributive data relating to SCAD will be processed into the database after it is completed and the data on other enterprises will be collected.

- In 2020 altitude maps of agricultural plants on economic regions, regions, villages were developed based on relief data (DEM model), reports reflecting the minimum, maximum and average height indicators were presented to the Agricultural Insurance Fund for the planning of insurance risks in agricultural areas.

- Also in 2020, Geographical data department of the Center geo-spatial data of agricultural lands was prepared according to the structure of the National Spatial Data and presented.

Price Database of Agricultural Products. In 2015, the Ministry of Agriculture, together with the Food and Agriculture Organization of the United Nations (FAO), created an information portal on agricultural prices, which was subsequently updated by the Ministry of Agriculture and created as Electronic Price Information Portal on agriculture www.agrarbazar.az.

The Electronic Price Information Portal on agriculture also contains the following information:

- Supply prices of fruit, vegetable, potato and watermelon and melon products from the site of trade, wholesale, retail and processing enterprises;
- Retail prices of animal-breeding products (meat, milk, eggs, honey);
- Prices purchased by milk reception centers;
- Wholesale and retail prices of meat;
- Sales prices of wool and leather for population or meat cutting stations;
- Prices of crops within seasonal sales and after seasonal wholesale;
- Prices for technical plants and other products of industrial raw materials purchased by organizations;

- Retail sale prices (grass, fertilizer, animal breeding).

Prices for all types of products or assortments are aggregated daily, weekly and monthly depending on the products, taking into account low, medium and high levels. However, in 2020, data on wholesale and retail prices of agricultural products were collected 6 days a week to assess the effects of the COVID-19 pandemic. Based on these data, *operative information bulletins* "On the price changes in wholesale and retail sales of agricultural products" have been prepared daily.

To improve the quality of the data entered into the database, weekly inspections were carried out following the form prepared and submitted to SCAD and the system continued to operate with the relevant improvements.

2. Scientific Researches

Agricultural Economics Research Center implements scientific justification for further improvement of agro policy in accordance with the requirements of current level of agricultural reforms of the country and global challenges.

- **Covering the main provisions of the "Strategic Road Map on production and processing of agricultural products in the Republic of Azerbaijan" approved by the Decree of the President of the Republic of Azerbaijan dated December 06, 2016, in 2020 research activities were carried out on "Sustainable development problems of agriculture", "Economic issues of application of innovations in agricultural sector", "Problems of improving the agribusiness environment" and research was carried out on 8 topics. The summary of the content of the research works carried out is given below:**

1. The research on "Evaluation of the agricultural policy in the Republic of Azerbaijan in terms of the sustainable development principles and directions of improvement" was carried out by *F. Fikratzade, M. Rzayev, P. Aliyev.*

According to the results of the research work, the relevant literature and materials were collected and systematized a detailed explanation of the concept of sustainable development, its essence, and significance was given. The factors that generate the need for sustainable development of the agricultural sector are also identified and ways to eliminate situations that negatively affect sustainable development are indicated. The components of the three main directions of agricultural development, increasing the level of economic growth due to structural changes, the development of the non-agricultural sector in the agricultural sector, reducing the level of poverty in rural areas, were analyzed and it

was determined which of them have broader advantages.

The important directions of sustainable and competitive development of the agricultural sector are comprehensively considered. The main tasks of forecasting and development in this area especially the connection of the sustainable development of the agricultural sector with the improvement of the social level of the village in the ecological environment.

2. The research on "Methodology for forecast the development of the agricultural sector, taking into account the factors of sustainable development" was carried out by *B. Ahmadov, K. Mammadova, T. Musayeva.*

The development of agriculture in the modern period is associated with the solution of issues of ensuring food security, meeting the growing needs of the population in food, and the use of available land, water, and other resources based on the principles of sustainable development. Land, water, are available in this area. These resources should be used following the principles of sustainable development since it is impossible to replace such necessary resources since agricultural modeling can be useful to justify solutions to practical problems that exist in this area.

Agricultural models are based on large amounts of data and depend on changing factors climate, cadastral data, agricultural land structure, using analytical software packages are used to make forecasts of possible risk. The impact of this risk on food security, the commodity market, and the volume of production costs. There are a few models related to this field - statistical, deterministic, stochastic, dynamic, and simulation models. These models used are extremely important for making both tactical and strategic decisions in any environment, regardless of the type or scope of application. The models can also be used to predict the possible impact of climate and technological changes on the cost and productivity of the final product, as well as to determine the risk of exposure. The use of crop production models for farmers and agricultural enterprises can also be used in making strategic decisions such as determining which crop to plant.

In agriculture, models based on various methodologies are used based on econometric and mathematical programming. Several different factors can lead to an increase or decrease in agricultural productivity. It is important to note that performance is not a required metric, but rather a reflection of the relationship between input and output. A field that produces twice as much yield as the previous year for a single crop is not necessarily doubly productive even if the farmer spends twice as much on that crop, the net change in yield may be zero.

3. The research on "Integration of agriculture and processing industry into the global value chain: realization of sustainable development conditions" was carried out by *F. Fikratzade, S. Hajiyeva, G. Amanova, N. Ramazanova.*

At present, the food and agriculture sector is increasingly organized within the global value chains (GVC). Thus, different stages of the process of transformation of raw material into a final consumer product are located in different countries. Added value from agriculture is exported in several ways. First, through the "first way": raw agricultural products, as a rule, are exported directly as intermediate resources, and then processed by the external

processing industry. Secondly, through "processing way": as a raw material is used as a resource to produce agricultural and food products, clothing and other processing products, additional value to agriculture is included in the extraction of other areas.

Studies conducted by the Organisation for Economic Co-operation and Development (OECD) have shown that (GVC) is a powerful tool for increasing the growth and employment of the sector while creating various export opportunities for the agricultural sector. Agro-food is associated with an increase in the value of the food and agriculture sector. On a large scale, the trade and agro-food sector accounts for 20-26% of the total revenues of the agricultural workforce. However, it should be noted that there are great differences between countries and spheres in this direction. In this regard, the factors affecting the participation of agri-food (GVC) and the creation of internal value-added, the determinants of participation in VAT, indicators on(GVC) were determined based on the research. Also, the participation index in the (GVC), the Lloyd index, which allows measuring intra-industry trade, the gravitational model for analysis of export potential, its structure, and appropriate form models were developed.

4. The research on ”Problems of development of agricultural land market in the Republic of Azerbaijan" was carried out by *H. Khalilov, A. Valiyev, K. Mammadova (Hasanli).*

The main objective of the research is to examine the overall volume of the agricultural land market in the country, its dynamics, structure, the situation of demand and supply in the market, the constituent elements, sizes, location on agricultural land, as well as factors shaping the market prices. The object of the study is the land market of the country on agricultural lands and various deals.

The research period of the topic covers 2020-2022. In the first year, the methodology of the research on the topic was developed, scientific literature on the problems of land market development published in the country and abroad was analyzed, theoretical approaches in this field were evaluated and other relevant generalizations were carried out, the scope of the data necessary for the analysis of the volume and structure of the land market, following the defined methodology, programs of surveys to be carried out to investigate the structure of demand and supply in the land market was developed and analyzed based on the indicators of the main factors of Farm Data Monitoring System (FDMS) which affects the activity in the land market.

As a result of the conducted research, proposals have been made on the implementation of several measures in the field of formation and regulation of prices in the agricultural lands market.

5. The research on ”Directions of improvement of stimulation mechanisms aplication of agricultural innovations in the Republic of Azerbaijan" was carried out by *B. Ahmadov, V. Babayeva, A. Hasanzade.*

The concept of "innovation" in world economic literature is interpreted as the opposite of the potential scientific and technological progress in real products and technologies.

Innovation following international standards is defined as the result of innovative activity embodied in the form of a new or improved product introduced to the market, a new or improved technological process used in practice.

In general, it is important to increase the application of innovations in agriculture to meet the growing population's demand for food products. Because innovations are not limited only to interesting ideas and the use of technology. Innovation in agriculture covers all aspects of the production cycle and reflects itself in all the rings of the value chain.

One of the most innovative innovations in agriculture is the adaptation of the product to climate change and the creation of new varieties using molecular markers based on the selection technology in terms of being resistant to climate influences.

Besides, innovation is also used to improve the efficiency of the use of resources, create added value in the final product production and ensure food safety. In terms of genetic improvement of plant varieties and breeding breeds to increase productivity and economic income, classify and protect genetic resources for food and agriculture, diagnose plant and animal diseases and develop vaccines, FAO considers innovation to be a broad spectrum of technologies used in food and agriculture. In general, innovations have a positive impact on the socio-economic and ecological aspects of small and family-peasant farms in the agrarian sector, and this trend is expected to continue in the future.

According to the results of 2019, experts have identified the most promising areas that can radically change agricultural production in the next 10-20 years. One of them is associated with drought-resistant plants. According to FAO estimates, Agriculture around the world consumes 70% of freshwater, and global warming at the same time increases the drought period by reducing water resources. This makes it necessary to create plant varieties that are capable of producing high yields even in drought conditions.

Another promising area is increasing productivity. According to the FAO research, the potential of increasing World productivity in the agrarian sector is about 7-15%. To achieve these results, it is necessary to adjust the planting times, improve irrigation systems, and produce new and properly selected plant varieties.

6. The research on ”Directions of improvement of tax and customs regulation in the agribusiness sector of the Republic of Azerbaijan" was carried by *B. Ahmadov, N. Gasimova, K. Mammadova.*

The essence of taxation policy on agribusiness sectors, the indicators used for the evaluation of this policy and the directions of tax regulation were identified in the research work. Also, the principles and criteria of taxation were differentiated, the world experience of the tax system in the field of agriculture was investigated, the state policy of Turkey, CIS countries, the Netherlands, Italy, Israel, and Ireland on tax-customs regulation in the relevant fields, as well as tax rates on specific directions were introduced.

One of the main focuses of the study is the state policy on Value Added Tax (VAT). To this end, the essence of VAT, the socio-economic basis of its application and specific directions for individual countries were defined, VAT rates applied to fertilizer and pesticide sales were introduced.

Based on the conducted research, the tax-customs policy implemented in the agricultural sector in Azerbaijan will be evaluated by making comparisons with the relevant countries and recommendations will be given for improvement of this system.

7. The research on ”Improvment of the mechanisms of the water resources use in agriculture” was carried by *M. Rzayev, P. Aliyev, G. Amanova, N. Ramazanova*.

The theoretical and methodological issues related to the use of water resources, as well as the history of irrigation development of the arable areas, the field-related experiences of different countries, were investigated, an exemplary scheme of management of irrigation systems was drawn up, indicators of water use in different countries, including the degree of water stress rates were presented in the research work. As a result of the research, it was found that the creation of associations of water users in the field of irrigation systems management by most countries for the present time is considered as the most effective and efficient method, and the experience in this regard is quite widespread.

At the next stage, such methodologies as Irrigation Management Transfer and Participatory Irrigation Management, as well as Public-Private Partnerships in the formation of water markets and irrigation management were analyzed.

8. The research on ”Methodology of risk assessment in the field of agriculture" was carried out by *B. Ahmadov, K. Mammadova, T. Musayev*.

The risks in agriculture, their essence and main characteristics, the emergence of risks, theoretical and practical basis of risk management, sources of risks, scope and factors, assessment, risk management, mitigation, world experience in this direction, etc. extensive research was carried out and the material and data obtained were analyzed in the course of the research.

The main sources of production risks in agriculture are air, climate change, pests, diseases, technology, genetics, machine efficiency and the quality of the materials used. At the same time, market risks are associated with issues that affect the price, quality, availability and access to the necessary products and services. Sudden changes around the world, such as weather or government decisions, can lead to sharp changes in the prices of products. Prices can vary greatly in markets where both local and global supply and demand conditions are constantly changing. Marketing risk is any market-related activity or event that causes the farmers to fluctuate in prices they buy or pay for a production product according to their products and refers to financial risks that pose a threat to the financial health of agricultural producers.

There are many resources available for risk management. Insurance agents, consultants in the field of crop and animal scarcity, livestock, marketing specialists, borrowers, lawyers and others can help plan risk management depending on specific needs. For example, over time, improvements in technology and product production experience have helped reduce risks and increase productivity, or new plant varieties resistant to disease and drought have been created on the basis of gene engineering.

3. Diagnostics and Analysis

Agricultural Economics Research Center analyzes current trends and conjuncture changes in agriculture, identifies factors affecting the current situation, predicts scenarios and makes recommendations for decision making when it is necessary.

Generally in 2020, analyzes, diagnostics and forecasting in the following directions were implemented for this purpose:

- ✓ The growth rate of the total aggregate product and value added in agriculture;
- ✓ Indicators of self-sufficiency and dependence on imports on food products;
- ✓ The conjuncture of the domestic and world market, price changes, market access and risks for agricultural products;
- ✓ Factors affecting productivity in agricultural sector;
- ✓ Economic efficiency of agricultural producers;
- ✓ Analysis of the value chain of agriculture and development of production capacity in various sectors;
- ✓ Investment needs for sustainable development of agricultural sector and food security;
- ✓ Providing farmers with production means, access to financial services and infrastructure;
- ✓ The effectiveness of regulatory events and state support in agricultural sector;
- ✓ Employment rates in agricultural sector (paid and unpaid labor, age groups, gender, migration, education indicators, etc.);
- ✓ Diagnosis of rural development.

- **The following analyses were carried out at the Center in 2020 and reports were prepared:**

- ✓ Overview of development prospects in agricultural sector 2020-2030.
- ✓ Reference on possible effects of problems arising from the spread of coronavirus on the development of agricultural sector and supply of the population with food.
- ✓ Restoration of the agricultural sector in our liberated territories: future tasks and forecast indicators.
- ✓ Report on farmers' access to the crop market and access to production resources.
- ✓ Sector Strategic Plan of the state budget of the Republic of Azerbaijan for the years 2021-2024 on agriculture within the framework of medium-term expenditure.
- ✓ Proposals on the establishment of intensive fruit orchards during the years of 2021-2025 with the state support.
- ✓ Proposals on the methodology of preparing short-term, medium-term, and long-term development plans for rural areas.
- ✓ Report on current problems and development goals of the dairy sector in Azerbaijan.
- ✓ Report on development of breeding poultry in Azerbaijan.
- ✓ Report on the results of the investigation of sugar and sugar beet production in Azerbaijan.
- ✓ The economic justification for the application of a restrictive duty on the import of food potatoes.
- ✓ The economic justification for the application of VAT in wholesale trade of agricultural products by trade intermediaries.
- ✓ The economic justification for changes to the relevant law on social insurance of landowners.
- ✓ Trends in the use of water resources in Azerbaijan and proposals on ways to increase efficiency.
- ✓ The economic justification for the exemption from VAT of agro-technical services.
- ✓ Increasing agricultural and export of agro-processing products: methods of diagnosing potential and problems.

- **38 reports have been prepared on various sub-sectors of agriculture with corresponding indicators (sowing area, production volume, productivity, import-export, as well as worldwide production and trade indicators).**

- **feasibility studies and model investment projects in the following sectors have been developed:**

- ✓ Diagnosis of a cotton cluster;
- ✓ Measuring the efficiency of irrigation systems;
- ✓ Feasibility study of aquaculture fisheries
- ✓ Feasibility study of intensive dairy farm;
- ✓ Feasibility study of modern milk processing factory;
- ✓ Feasibility study of seed farming;
- ✓ Feasibility study of large grain farms;
- ✓ Feasibility study of intensive and superintensive fruit orchards;
- ✓ Preparation of model investment projects for the construction of refrigerated warehouses and grain elevators.

4. Monitoring and Evaluation

Agricultural Economics Research Center implements monitoring and evaluation of the results of agricultural policy based on the methods used in international practice.

In accordance with the Mission of the Center, the strategic goals for sustainable development of agriculture, food security and rural development, the effectiveness of state support policy for agriculture, the impact of agricultural policy on the economic activity of agricultural producers, the implementation of state programs on agricultural policy and the effectiveness of the services provided by the agencies included in the structure of the Ministry of Agriculture is monitored and evaluated.

- **Following the Action Plan of the Center, monitoring and evaluation on the following directions were carried out in 2020:**

  - Conducting surveys within the framework of the Farm Data Monitoring System was continued;
  - Surveys were conducted within the framework of monitoring of farmers' access to the market and supply of production resources;
  - Reports on the implementation of the following state programs on agriculture adopted in 2020, as well as on the National Action Plan and other strategic policy documents have been prepared:

1. Report about the implemented work on the results of the year in the field of agriculture;
2. Report concerning the implemented work within the framework of selected criteria for achieving Sustainable Development Goals;
3. State Program for Ensuring Food Safety in the Republic of Azerbaijan for 2019-2025;
4. Report on the implemented work to support innovative development (including startup activity) ;
5. State program concerning development of industry in the Republic of Azerbaijan for 2015-2020;
6. State Program on Development of viticulture in the Republic of Azerbaijan in 2012-2020;
7. Azerbaijan 2020: vision for the future Development Concept;
8. State Program on the development of wine-making in the Republic of Azerbaijan in 2018-2025;
9. State Program on Development of tobacco-growing in the Republic of Azerbaijan for 2017-2021;
10. State Program on regions' socio-economic development of the Republic of Azerbaijan in 2019-2023;
11. Report on the results of the implemented work in the field of consumer protection in accordance with the Decree of the President of the Republic of Azerbaijan No. 203 dated December 25, 2019;
12. State Program on Development of cotton-growing in the Republic of Azerbaijan for 2017-2022;
13. State Program on Development of sericulture and silkworm breeding in the Republic of Azerbaijan for 2018-2025;
14. State Program on Development of tea-growing in the Republic of Azerbaijan for 2018-2027;
15. State Program on Development of citrus fruit-growing in the Republic of Azerbaijan for 2018-2025;
16. State Program for Development of paddy growing in the Republic of Azerbaijan for 2018-2025;
17. State Program on Development of Agricultural Cooperation in the Republic of Azerbaijan for 2017-2022;
18. Report on the implemented work on the Strategic Road Map "On the production and processing of agricultural products in the Republic of Azerbaijan";
19. Information on the results of monitoring the state of dependence on subsidies in the regions under subsidies from the state budget;
20. Submission of relevant information on the development of seed production in the country and monitoring of the current situation;
21. National Strategy for the Protection and Sustainable Use of Biodiversity in the Republic of Azerbaijan for 2017-2020;
22. Report on the implemented work on the Action Plan of the “Strategic Roadmap for the development of vocational education and training in the Republic of Azerbaijan”;
23. Reports on the implemented work on the other 10 State Programs and Action Plans.

5. Doctoral Education

Agricultural Economics Research Center has a educational program for training of highly qualified personnel in agricultural economics and agricultural policy. Our policy in this program is to train mobile and concentrated researchers with high level of analytical skills, able to learn and apply modern methods of research.

The Center carries out doctoral and post doctoral programs in agricultural economics and trains highly qualified personnel in these programs.

Programs are conducted in full-time and part-time forms. During the preparatory process the topic of dissertation is determined, guidelines and methodological support are provided to students, regular discussions are held and students' activities are evaluated.

- In 2020, the Center trained 23 highly qualified personnel in the doctoral program, 12 in the post doctoral program, and each of them is carrying out research work on the approved topic. At the beginning of the year, to evaluate the annual activities of doctoral students, following the relevant rules, their certification was carried out by the decision of the Scientific Council of the Center No. 04 dated November 25, 2020.
- Questions and tickets for admission and doctoral program exams and different exam subjects have been revised.
- In 2020, the initial documentation of doctoral admissions was organized, their dissertation topics and scientific supervisors were identified, considered by the Scientific Council, submitted to the Scientific Council for Economic Sciences under the Coordination Council for Scientific Research for approval.
- The admission plan for admission to doctoral programs of the Center for 2021 has been prepared and submitted accordingly. Following the plan approved by the Cabinet of Ministers of the Republic of Azerbaijan, 2 people submitted documents for admission to post doctoral program, 7 people to the doctoral program. At present, the admission process is underway and the necessary work is implemented in this regard.
- In 2020, 1 person completed the post doctoral program, 3 people completed the doctoral program and submitted their dissertations for preliminary discussions for defense.
- During 2020, the Center's staff, post doctoral and doctoral students published 49 scientific papers in various sources (8 articles, including 5 abroad, Impact Fact), including 1 collective monograph abroad, 13 thesises (3 abroad), 6 newspaper articles.

6. Scientific conferences. Publications. Public relations

Conference. On December 15, 2020, an online scientific-practical conference was held at the Agricultural Economics Research Center entitled “Sustainable development of agriculture: global challenges and implemented reforms in Azerbaijan".

Opening the conference, Minister of Agriculture of the Republic of Azerbaijan Mr. Inam Karimov delivered a speech on the theme of “Implemented works and planned measures towards sustainable development of agriculture in Azerbaijan”. Then, Head of the FAO Partnership and Liaison Office in Azerbaijan Melek Cakmak on the theme of ”Contribution of Azerbaijan-FAO cooperation to sustainable development of agriculture in the country“, the Chairman of the Agrarian Policy Committee of Milli Majlis of Republic of Azerbaijan Tahir Rzayev on the theme of ”Issues of improving the legislative framework for sustainable development of agriculture”, Vice-president of ANAS Irada Huseynova on the theme of "The role of science, technology and innovations in the sustainable development of agriculture”, Executive director of the Center for Analysis of Economic Reforms and Communication Vusal Gasimli on the theme of ”Karabakh: innovative driver of new economic development stage in Azerbaijan“, Rector of Azerbaijan State Agricultural University Ibrahim Jafarov on the theme of ”Role of agrarian education in the sustainable development of agriculture“, Director of the Agricultural Economics Research Center Firdovsi Fikratzade on the theme of ”Issues of restoration of agriculture in liberated territories" made speeches at the Plenary Session of the conference.

The themes of “Heightening the efficiency of the use of resources in the agricultural sector”, “Protection and improvement of land and water resources”, “Heightening the level of economic development and social welfare in rural areas”, “Development of agriculture in liberated areas” and “Improvement of mechanisms providing sustainable development of agriculture” were discussed in the second part of the conference. Representatives of the academic circles, specialists, as well as young scientists took part in the discussions related to the agrarian sphere, and delivered theses and articles in accordance with the topics.

The materials of the conference were published in the special edition of the “Agricultural Economics" journal.

Within the framework of **the ARC platform (Agricultural Researchers Discussion Platform)**, two seminars were held on the theme of “Databases and analysis on World Market Prices of agricultural and food products” and “Preparation of techno-economic argumentations and investment projects in the agricultural sector” until the COVID-19 pandemic in January and February 2020.

Publications. In 2020, the scientific-practical journal entitled “Agricultural Economics” (Azerbaijanian journal of Agricultural Economics) of the Center was published once for every quarter. Scientific articles were published in 3 languages (Azerbaijani, English, Russian) in the journal. Also the webpage of the journal with an address *agroeconomics.az* was prepared, articles were placed on the site.

In line with above mentioned, a **Monthly Information Bulletin** reflecting the main statistical indicators related to agriculture and a **Monthly Short Review** concerning the world market conjuncture on agriculture and food products were prepared by the Center. Electronic versions of the Bulletin and Review are sent to influential international organizations, embassies, as well as local financial and business organizations operating in Azerbaijan.

Public Relations. In 2020, Several works were implemented in the field of public relations in the Center. During the year, the publication materials related to the work done in the agricultural sphere, achievements in the Center's **https://atm.gov.az/** in two languages (Azerbaijani and English) as well as on the website **https://www.facebook.com/atm.gov.az** in the social network account, promotion of state policy in this field, the activities of the Ministry of Agriculture, the Ministry's bodies, and Agricultural Economics Research Center were provided.

In 2020, employees and specialists of the Center, including the leadership gave more than 50 interviews and statements on various fields of agriculture, implemented work, upcoming tasks in the periodical press, especially on television.

AZ 1010 Baku, Azerbaijan
Nizami street, 92
(994 12) 599 08 88
www.atm.gov.az
info@atm.gov.az