

THE MINISTRY OF EDUCATION OF THE REPUBLIC OF AZERBAIJAN

AZERBAIJAN STATE UNIVERSITY OF ECONOMICS

INTERNATIONAL CENTER OF GRADUATE EDUCATION

MASTER DISSERTATION

on the topic

**“THE DEVELOPMENT OF POLICY FOR THE AGRICULTURAL
TRANSFORMATIONS AND LIVELIHOODS: JABRAIL AS A CASE
STUDY”**

Hasanova Parvana Mehman

BAKU – 2022

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Elm andı

Mən, Həsənova Pərvanə Mehman qızı and içirəm ki, “The development of policy for the Agricultural transformations and livelihoods: Jabrail as a Case Study” mövzusunda magistr dissertasiyasını elmi əxlaq normalarına və istinad qaydalarına tam riayət etməklə və istifadə etdiyim bütün mənbələri ədəbiyyat siyahısında əks etdirməklə yazmışam.

KƏND TƏSƏRRÜFATININ TRANSFORMASIYALARI VƏ DOLANIŞIQ ÜÇÜN SİYASƏTİN İNKİŞAF ETDİRİLMƏSİ: NÜMUNƏ TƏDQIQAT KİMİ CƏBRAYIL

XÜLASƏ

Tədqiqatın aktuallığı: Ölkədə iqtisadi transformasiyaya nail olmaq, ərzaq təhlükəsizliyinin təmin edilməsi, əhalinin qidalanmasının yaxşılaşdırılması üçün kənd təsərrüfatının modernləşdirilməsi prosesi mühüm əhəmiyyət kəsb edir. Ermənilərdən azad edilmiş torpaqlarımızda bütün infrastruktur, yollar, kənd təsərrüfatı, rabitə demək olar ki, tamamilə dağıdılmışdır. Ona görə də ölkəmizdə, xüsusən də Qarabağın iqtisadi bərpa prosesində kənd təsərrüfatı transformasiyalarının və dolanışiq vasitələrinin tətbiq edilməsi olduqca aktual görünür.

Tədqiqatın məqsədi: Azərbaycanda kənd təsərrüfatının və dolanışığın mövcud vəziyyətinin öyrənilməsi, müasir texnologiyaların tətbiqi nəticəsində bu sahələrin inkişafının dəstəklənməsi, işğaldan azad edilmiş torpaqlarımızda həyatın yenidən bərpası üçün siyasətin hazırlanması və təkliflərin verilməsidir.

İstifadə olunmuş tədqiqat metodları: Tədqiqat işi iqtisadi-statistik təhlilə, müqayisəli təhlilə, empirik təhlilə və induktiv yanaşmaya əsaslanır. Həmçinin araşdırma zamanı SWOT analizdən, kəmiyyət və keyfiyyət metodlarından istifadə edilmişdir.

Tədqiqatın informasiya bazası: Məlumatlar əsasən Azərbaycan Respublikasının rəsmi sənədlərindən, Azərbaycan Respublikası Prezidentinin imzaladığı sənədlərdən, milli və xarici iqtisadçıların əsərlərindən, Dövlət Statistika Komitəsindən, müxtəlif ədəbi nəşrlərdən və məqalələrdən əldə edilmişdir.

Tədqiqatın məhdudiyyətləri: Ölkədə aqrar sektorun və dolanışığın dayanıqlı inkişafın təmin edilməsi üçün tam təkmilləşmiş siyasətin olmaması, işğaldan əvvəlki dövrə aid statistik məlumatların məhdud olması, araşdırma üçün ədəbiyyatın çatışmazlığı

Tədqiqatın elmi yeniliyi və praktiki nəticələri: Araşdırmanın gözlənilən nəticəsi ölkədə əhalinin rifahının tam təmin edilməsi, ərzaq təhlükəsizliyinin və qidaya çıxışın tam təşkili üçün çatışmazlıqların aradan qaldırılması, kənd təsərrüfatının transformasiyası üçün siyasətlərin təklif edilməsidir.

Nəticələrin istifadə oluna biləcəyi sahələr: Tədqiqatın nəticələri qanunların, proqramların, layihələrin, kənd təsərrüfatı və yaşam vasitələrinin inkişaf strategiyasının təkmilləşdirilməsi üçün təkliflərin hazırlanmasında istifadə oluna bilər.

Açar sözlər: kənd təsərrüfatı, dolanışiq, iqtisadiyyat, transformasiya, işğaldan azad edilmiş torpaqlar

THE DEVELOPMENT OF POLICY FOR THE AGRICULTURAL TRANSFORMATIONS AND LIVELIHOODS: JABRAIL AS A CASE STUDY

SUMMARY

The actuality of the subject: The process of modernization of agriculture is essential for achieving economic transformation in the country, ensuring food security, and improving the population's nutrition. Almost everything we need to live in our liberated lands is non-existent. Therefore, the study and application of agricultural transformations and livelihoods, especially in the economic recovery process in Karabakh, seems very relevant.

Purpose and tasks of the research: The study of the current state of agriculture and livelihood in Azerbaijan, the support for the development of these areas as a result of the application of modern technologies, and the policies and proposals forming for the restoration of life in our liberated lands.

Used research methods: This research paper is based on economic-statistical analysis, comparative analysis, empirical analysis, and an inductive approach. The study also used SWOT analysis, quantitative and qualitative methods.

The information base of the research: Data is mainly obtained from the official documents of the Republic of Azerbaijan, works by national and foreign economists, the State Statistical Committee, various literary publications, and articles.

Restrictions of research: Lack of a fully developed policy to ensure sustainable development of the agricultural sector and livelihoods in the country, limited statistical data on the pre-occupation period, lack of literature for research.

The novelty and practical results of investigation: The expected result of the study is to ensure the well-being of the country's population entirely, eliminate shortcomings in the organization of food security and access to food, also propose policies for the transformation of agriculture.

Scientific-practical significance of results: The results of the study can be used to develop proposals for improving laws, programs, projects, agricultural and livelihood development strategies.

Keywords: agriculture, livelihoods, economy, transformation, liberated lands

ABBREVIATIONS

AI	Artificial intelligence
AZTAF	Azerbaijan Rapid Technical Assistance Facility
CERAC	Center for Economic Reforms Analysis and Communication
EU	European Union
ICT	Information and Communication Technologies
IDPs	Internally Displaced People
IT	Information Technology
GDP	Gross Domestic Product
GOSB	Gebze Organize Sanayi Bölgesi (Gebze Organized Industry Zone)
GPS	Global Positioning System
HPP	Hydroelectric Power plant
OJSC	Open Joint-Stock Company
RFID	Radio Frequency Identification
SSR	Sovet Socialist Republic
SWOT	Strengths, Weaknesses, Opportunities, Threats
US	United States
VRA	Variable Rate Application
WB	World Bank
WWII	World War II

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INTRODUCTION

Relevance of the research topic: Agricultural transformation can create jobs, reduce malnutrition, boost the economy, increase the income level in a country, improve traditional technologies ext. Armenians destroyed all the infrastructure, roads, agriculture, communications, and livelihoods in the liberated territories of Karabakh. Nowadays, more attention should be placed on agriculture and livestock in these lands. Therefore, the study of agricultural transformations and livelihoods in the current situation in Azerbaijan and the process of economic recovery in Karabakh seems to be very relevant.

Statement of the problem and learning level: Numerous studies have been conducted on agriculture, livelihoods, and related issues. These include the scientific research of I. Aliyev, F. Fikretzadeh, S. Hajiyeva, T. Giordano, H. Ganiyev, S. Rzayev and others. The share of agriculture in Azerbaijan's total exports is very low compared to other sectors. There are certain shortcomings in the measures taken to develop this area, and these gaps must be found and repaired. Agricultural infrastructure is not fully equipped with modern technology. It is important to use the experience of foreign countries in the reconstruction of the economy and life in our liberated lands.

Purposes and objectives of the research: The primary purposes of research are identifying and removing barriers to agricultural development, increasing the country's food supply, digitalization through the use of modern technologies, carrying out the agrarian transformation, reconstruction of agriculture, infrastructure, communications, and livelihoods in liberated lands.

Object and subject of the research: The research object is critical features of the aspects of agriculture transformation and livelihoods. The research subject is the theoretical and practical study of agriculture and livelihood in modern times.

Research methods: This research paper is based on secondary research methodology and empirical analysis. The other methods used in work were

quantitative and quality. A quantitative method was based on statistical data, and a qualitative method was used to assess the level of agriculture and livelihoods to determine the nature of the main problems. The empirical analysis was used to study how other experienced countries developed agriculture and infrastructure in a short period after the war. The inductive method will be used directly to generalize, draw conclusions, and make suggestions.

Research database: The database of the research was constituted by legal documents of Azerbaijan, data from the Statistics Committee, and reports from international organizations. In addition, recent scientific research, various books, newspapers, articles, data from the media, and other Internet resources have been widely used.

Research limitations: Lack of a fully developed policy to ensure sustainable development of the agricultural sector and livelihoods in the country, limited statistical data on the pre-occupation period, and lack of literature for research.

Scientific novelty of the research: Improving agricultural efficiency, living standards, and effective risk management will help to respond quickly to change. The introduction of new technologies and concepts and the improvement of existing agriculture and livelihoods will positively impact regional development, job creation, and the stimulation of local products and services.

Scientific and practical significance of the results: The study results can be used to develop laws, programs, projects, and proposals to improve the development strategy of agriculture and livelihoods. The application of modern technology and innovations will support the process of agricultural transformation. The transformation of agriculture will affect the development of the economy, which will contribute to the intensive and sustainable growth in the regions. The experience of other countries will be applied to the reconstruction of life in our liberated lands.

CHAPTER I. THE DEVELOPMENT OF AGRICULTURE AND LIVELIHOODS IN AZERBAIJAN

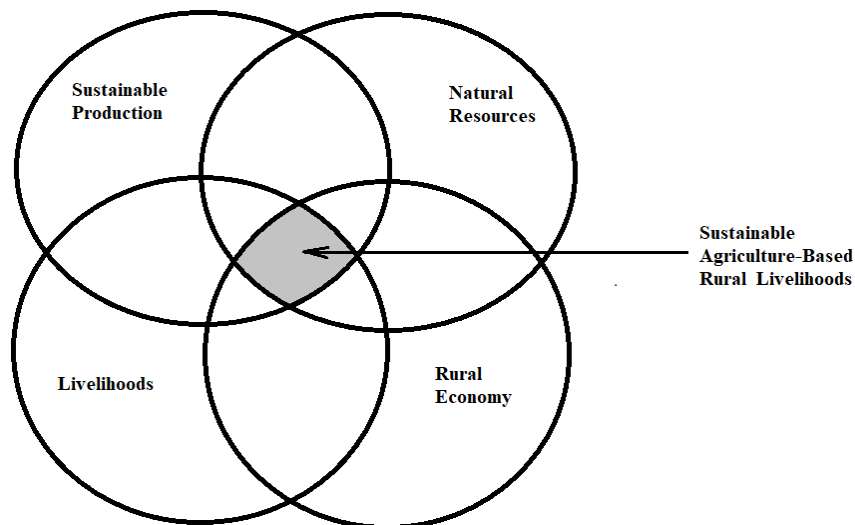
1.1. Agricultural transformation and rural development. Features of agriculture and livelihoods

Agricultural transformation reduces poverty in the country, increases the income level of rural farmers, provides food security, raises the level of nutrition and the production level in villages (Boettiger S., Denis N., Sanghvi S. 2017:p.1). Agricultural transformation contributes to the overall development of the country's economy. Many countries intend to use their investments and policies to accelerate the transformation of the agricultural sector and set up mechanisms to implement the plans. They are planning to improve this process to integrate into the global economy. The missing components for the transformation process are listed below:

- Lack of knowledge of leaders, weak support for transformation leadership;
- Disagreements between different levels of government.

A definition of Sustainable Agriculture is based on one's understanding of how numerous levels and components, such as economic, environmental, social, institutional, and cultural aspects, affect or influence agricultural systems. The concept of sustainable agriculture has developed from an approach to farming systems that focuses on productivity and stability. Picture 1 illustrates the existence of four core elements is required for SARLs: sustainable production, natural resources, livelihoods, and rural economy. These four elements are interconnected, and the development of one based on modern technology and innovation leads to the development of others (Chaudhry G., Ahmed J., Zia Sh., Ul-Mulk M., Iftikhar U., Khan F. 2014: p.19-21). There must be a two-way relationship between the local economy and agricultural production systems: receiving and supplying products. This process will help the process of building a fair economy.

Picture 1: Core Elements of Sustainable Agriculture-Based Rural Livelihoods



Source: Chaudhry G., Ahmed J., Zia Sh., Ul-Mulk M., Iftikhar U., Khan F. 2014: p.19-21

Economist Adam Smith pointed out that the source of wealth is neither precious stones nor agricultural products grown on land. Wealth is determined by the total amount of goods produced in all areas (agriculture, industry, trade) with the participation of all factors of production (Şəkərəliyev A. 2009: s.161-162).

Production is the basis of any social, economic, or political process occurring in any country. The primary food source is agriculture. Agriculture provides people with food, solves the employment problems of the country's population, and plays a unique role in developing foreign economic relations, especially foreign trade. Azerbaijan, like other countries, has all of the conditions for agricultural growth. The country's natural resources, arable lands, forests, geographical region, and climatic conditions provide the foundation for this. Azerbaijan ranks first in the world regarding economic growth and social welfare. Agriculture has an essential and significant role in the economy.

Agriculture consists of crop and livestock production. Livestock mainly includes dairy, meat-dairy, beef cattle, pigs, and poultry, while crop production includes grain, cotton, vegetables, viticulture, and tobacco. The main mean of agricultural production is land, fertilizers are given to increase productivity, a rotating cropping system is

applied, and proper irrigation is carried out; new agro-technical measures are being implemented.

The development of agriculture in the world must be separated from the types of intensive and extensive development. This approach is necessary to identify the factors that affect the development of agriculture. It is also difficult to say whether the development will take place in a fully intensive or fully extensive way. Therefore, both types of development must identify the identified factors. If the development of agriculture is extensive, then the main factor is the land resources and their level of suitability. In general, the volume and range of agricultural products depend on the level of economic development of countries, capital expenditures on agriculture, livestock development, etc. However, land, forests, water reservoirs, rivers, and so on are irreplaceable factors and are the main conditions for both intensive and extensive development. Therefore, the main concern of all mankind should be to protect the land. At present, the attitude toward land in the world is unsatisfactory. According to statistics, sown areas continue to decline. This means that the possibility of putting new land plots into use is gradually decreasing. As a result, the protection of arable lands and their efficient use has become an important factor in the development of agriculture. Livestock development can also occur in extensive and intensive types. Intensively developed by increasing the live weight of the animal. On the contrary, extensive development is achieved by increasing the number of animals of the same or slightly different weight. In developed countries, livestock breeding is mainly intensive. For example, in these countries, the amount of meat and milk from a cow can be 3–4 times higher than in backward countries. It can be concluded that the most effective way to increase agricultural production is through intensive farming. Intensive development is carried out in the following areas.

The application of various mineral fertilizers to the soil plays a key role in the chemicalization of agriculture. Much has been done in this area in the second half of the last century. As a result, agricultural production increased several times and

exceeded population growth. This saved the world's population from the threat of famine. It should be noted that 40% of the increase in production was due to fertilizers. Fertilizer itself is growing very fast.

Recently, the use of fertilizers in developed countries has begun to decline. This is done to prevent environmental pollution and reduce silicates in meat, milk, fruits, and vegetables. Demand for environmentally friendly agricultural products has also increased in the world market. There are issues of efficient use of fertilizers or the creation of fertilizer-free agriculture. The more important this idea is for human health, the more frightening it will be to reduce labor productivity in agriculture. Therefore, despite the implementation of measures in developed countries to reduce the application of fertilizers to the soil, chemicalization in the agricultural sector does not slow down.

Fertilization of agricultural products requires normal irrigation of plants. The way to expand irrigated lands is in itself a way of extensive development of the agrarian sector. With the optimal amount of fertilizer applied to irrigated lands, it is possible to increase productivity and ensure intensive agricultural development. So, instead of talking about the dangers of fertilizers and other chemical methods, we should talk about their rational, optimal, and scientific use. The event carried out along with irrigation is a scientific selection work. The main purpose of scientific selection is to find and use new, more environmentally friendly, and more productive seeds. This method enhances the process of intensification of agriculture. Allows you to increase productivity by an average of 30% (Əliyev A., Şəkərəliyev A., Dadaşov İ. 2003: s.542-546).

The Food and Agriculture Organization of the United Nations has been operating since 1945. Its primary purpose is to increase food security in the country, improve people's lives, increase production efficiency, distribute food and agricultural products, improve the living standards of the rural population, and positively impact the development of the overall economy. The major focus should

be on guaranteeing food security and adequate financing of imports to secure the country's food security. The process of local food security and nutrition is closely linked to developing a regional market economy. The rich natural resources of our country and its good geographical location create conditions for producing food.

According to the research, different forms of the economy can be developed in different regions and districts of the country. Based on the results obtained from the regions, it is necessary to invest in the most promising form of economic development. Getting more and better products makes that sector more efficient. Despite the changes in the agricultural sector, it has not been possible to fully meet the food supply in the country for several products. Therefore, special attention should be paid to saturating the domestic market by increasing domestic production and exporting products to foreign countries.

Special measures must be taken to solve problems in the agricultural sector. Improvement of market infrastructure and wholesale agricultural exchanges will create conditions for achieving positive results. Additionally, tax breaks for agricultural producers and reductions in customs charges on imported agricultural machinery and equipment have slightly improved. Particular attention should be paid to developing entrepreneurship in the regions. Entrepreneurs are the coordinators of our future today. Using the innovations of our time, they master the skills of digitalization of technology, organization, and management of production through daily practice. Consequently, future generations will benefit from the knowledge and experience gained by entrepreneurs. It is necessary to strengthen the organization of financial and credit assistance to Azerbaijani entrepreneurs by international and local organizations. Systematic and fair distribution of property and land shares in agriculture is crucial. Credit resources should be created to develop agriculture and living in the regions. Relations between banking and financial institutions and agricultural enterprises in the regions should be strengthened. The state credit policy should be different from other structures in all enterprises engaged in agricultural

production. Conditions must be created to stabilize the financial condition of these enterprises, increase the efficiency of credit use, and ensure its timely repayment. Establishing private banks in rural areas is essential to improve this process (Aliyev İ. 2008: s.276-287).

One of the main occupations of Azerbaijan since ancient times is agriculture. Mainly viticulture, fruit growing, and silkworm breeding are widespread in our country. Livestock breeding has also developed, as most of our territories are mountainous. The development of cattle breeding also leads to the development of carpet-making and weaving. Today, the results of the steps taken to increase the social welfare of the people in the Azerbaijani economy, improve livelihoods in the country, solve social problems, ensure food security, and improve infrastructure are being observed with special attention (Abasov İ. 2013: s.78-82).

Our country faced several difficulties in the first years of independence. These include an incomplete legislative framework in the agricultural sector, the tax system's complexity, lack of initial capital and working capital, difficulties in obtaining bank loans, and limited opportunities for leasing services. Farmers did not have enough experience to transition to market relations and export their products to foreign markets. The agrarian sector had a particular need for state support to use new sophisticated machinery and equipment and the application of technology. The share of total investment in this area was very low. Also, in different regions, usable land plots were unevenly distributed, useful land plots were limited in our densely populated areas, and narrow specialization in agricultural products (Hacıyeva N. 202: s.100-101).

In order to ensure the rapid development of the agricultural sector in our country, it is poorly implemented as an element of a management system for the development of infrastructure, which in turn lags behind in terms of compliance with modern market requirements. This factor will reduce the effectiveness of the agro-industrial complex management mechanisms. There is a need for changes in the

management structures of the agrarian sector, as duplicative structures must be eliminated. Then, society and the economy must be gradually prepared for the process of centralization (<http://www.geostrategiya.az/news.php?id=125>).

1.2. The development process of the Azerbaijani agrarian sector and livelihoods.

The factors affecting agricultural and livelihoods development in Azerbaijan

If we look at the recent past, we can see that from 1988 to 1993, there were panics in the socio-political life of Azerbaijan: defeats on the front, anarchy, chaos, civil war, and so on. To prevent such a threat and tragedy, the people invited Heydar Aliyev to power for the second time. June 15, 1993, is written in golden letters in the history of Azerbaijan, and the Azerbaijani people celebrate this day every year as the Day of National Salvation. Heydar Aliyev was well aware that it was impossible to achieve high results without investing in agriculture. Therefore, substantial measures have been taken to develop this area. From 1974 to 1975, our country was at the forefront of agricultural production in the USSR compared to other countries. At that time, concrete ways of agricultural development were identified, and substantial measures were taken to ensure the dynamics of this development. Agrarian reforms were carried out systematically and rapidly from 1996 to 1998, establishing the legal framework for agricultural reform.

Consequently, the lands became the private property of the villagers, and market principles have also been formed in the agricultural sector. The measures taken in agriculture led to the intensive development of crop production and animal husbandry, special attention was paid to the development of cotton and viticulture in crop production, new techniques were applied in the production process, etc. Plant enterprises, livestock complexes, poultry factories, and feed shops were established in rural areas. Thus, the investment in agricultural development initiated by Heydar Aliyev paid off quickly. From 1969 to 1982 the volume of net agricultural output increased by an average of 7.5 percent annually.

Table 1 describes the production indicators of agricultural products from 1969 to 1982. Grain production increased 2.11 times, cotton production 1.87 times, grapes production 6.68 times, vegetable production 2.46 times, tobacco production 2.33 times, fruits and berries production 6.61 times. In 1982, the gross agricultural output increased 2.5 times compared to 1969.

Table 1: Production of agricultural products in 1969 and 1982, thousands of tons

	1969	1982	1969/1982, times
Grain	573.9	1211.3	2.11
Cotton	299.4	558.9	1.87
Grapes	272.0	1815.6	6.68
Vegetables	372.0	916.7	2.46
Tobacco	24.5	57.0	2.33
Fruits and berries	52.2	345.0	6.61

Source: State Statistics Committee of the Republic of Azerbaijan, 2013
<https://www.stat.gov.az/source/others/H.Aliyev/Pdf/14-21.pdf>

During these years, special attention was paid to the development of transport, communication, trade, healthcare, and education. Freight transportation in the country increased from 243.1 million tons to 477.9 million tons, and passenger transportation increased from 527.8 million to 961.5 million passengers. The paved roads have increased from 12.7 thousand km to 20.4 thousand km. Telephone stations were built in urban and rural areas of the country, and post offices and communication facilities were put into operation. As a result, postal and communication services increased 2.8 times, the number of used telephones increased 2.2 times, and telephone calls increased 3 times. The number of trade enterprises and trade turnover increased. The volume of consumer goods sold to the population from trade networks and catering services has doubled. In 1982, the employed population increased 1.4 times compared to 1969 and reached 2428.2 thousand people. The level of education of the population also increased. The number of people with higher and secondary education per 1,000 people over 15 age rose from 327 to 501. Also, 754 hospitals and 1191 outpatient clinics in the country provided medical services to the population.

The number of doctors increased 1.8 times, the number of nurses increased 1.5 times, and the number of hospital beds increased by 34 % (<https://www.stat.gov.az/source/others/H.Aliyev/Pdf/14-21.pdf>).

On March 22, 1999, Heydar Aliyev signed a decree "On some measures to accelerate reforms in the agricultural sector." Therefore, the Cabinet of Ministers decided to sell oil products to agricultural producers at a discounted retail price from the state budget. These include exemption of peasants from all taxes except land tax, providing subsidies to those engaged in agriculture, and providing soft loans to farmers. In order to expand state support for the agricultural sector, the President has developed a new program in this area, which includes measures to protect finance, credit, banking, taxes, prices, and the domestic market. In November 1999, a decree was signed on the State Program on Deepening Agrarian Reforms and Support for the Development of Entrepreneurship in Agriculture in the Republic of Azerbaijan for 1999-2000.

As a result of the continuation of these reforms by President Ilham Aliyev, the existing reforms have been further developed, and the development of the agricultural sector has become one of the main goals. Over the past 20 years, Azerbaijan has taken extensive measures to accelerate the growth of the non-oil sector, strengthened the state's economic policy in this area, and adopted state programs, strategies, and concepts. According to the decrees and orders signed by President Ilham Aliyev, several measures have been taken to develop agriculture. The number of large farms has increased with the help of state financial assistance vehicles. As a result of the measures taken, dependence on imports has been reduced, food security has been strengthened, employment has increased, consumption has stabilized, export potential has increased, land and water resources have been used efficiently, and arable land has been increased (<https://azerbaijan.az/related-information/272>).

The "Strategic Road Map for the Production and Processing of Agricultural Products in the Republic of Azerbaijan" was developed by Order of the President of

the Republic of Azerbaijan No. 1897, dated March 16, 2016. The Strategic Roadmap highlights the country's long-term agricultural development objectives. The Agrarian Services Agency was founded under the Ministry of Agriculture of the Republic of Azerbaijan to enhance agrarian management. At present, the state provides extensive support for the development of agriculture (<https://e-qanun.az/framework/34254>).

Within the framework of this strategic roadmap, the implementation of the measures mentioned below is successfully continued:

- Growing competitive agricultural products at the regional and sectoral levels;
- Increasing access to international markets;
- Improving the business environment and regulatory framework for small and medium-sized enterprises;
- Strengthening food security;
- The growth of a competitive agricultural sector through improved agrarian science and education;
- Increase the production of necessary food products to replace imports in the domestic market;
- Increasing employment opportunities in rural areas;
- Improving the population's living standards by ensuring the improvement of social welfare in rural areas;
- The development of climate-adapted agriculture to protect the environment, land, and water resources;
- The application of advanced technologies to improve the efficiency of water and land use.

From 2004–to 2018, when state programs were implemented due to targeted measures, more than 2 million new jobs were created, including 1.5 million permanent ones, more than 100,000 business entities, unemployment fell to 5 percent, and the poverty rate fell to 5.1 percent (Musayeva R. 2019: s.170).

1.3. The Importance of Azerbaijan for the economy of the SSR. Potential of Karabakh's agriculture and livelihoods in the pre-occupation period

Azerbaijan SSR was a developed agricultural republic. The basis of agriculture was cotton-growing, viticulture, grain growing, vegetable growing, tobacco growing, silk growing, fruit growing, and tea growing. The Azerbaijani SSR produced 10% cottonseed meal, 16% tobacco, 26% grapes, 16–17% cherries and citrus fruits, and 5.2% tea leaves produced in the Soviet Union. The percentage of gross national product differed by sector: 59.3% industry, 17.7% agriculture, 3.5% transport and communications, 11.4% construction, and the remaining 8.1% (Qəniyev H. 2017: s.35).

There were favorable conditions for the production of agricultural products in the Azerbaijan SSR. Cotton growing is one of the main branches of agriculture in Azerbaijan. Azerbaijan accounted for 10% of the cotton produced in the Soviet Union. However, Azerbaijani cotton was not sold at world market prices. In Azerbaijan, which is famous for its wine, only 14–15% of this product is packaged in the country, and the rest is openly sent to other regions. Thus, Azerbaijan was deprived of millions of manats. Thus, in the early 1990s, there was a shortage of currency for the enterprises' technical reconstruction. Exports, on the other hand, create major problems for the economy. The development of viticulture in Azerbaijan in the 70s greatly impacted the growth of the population's money and the improvement of living conditions. Azerbaijan became one of the country's wine-growing centers.

During Soviet rule, agriculture in Azerbaijan was weak and one-sided, with incomplete processing. As a result, the exports of these products to foreign countries were very low. By the end of the 1980s, 90% of the cotton yarn produced in Azerbaijan, 93% washed natural wool, and 92% fermented tobacco were exported. In other words, the republic participated more as a raw material base. Consequently, towards the beginning of the 1990s, enterprises appeared in the republic needing

modern equipment and reconstruction. Thus, the scientific and technical potential of the country for the development of the agricultural sector was great. However, this did not fully solve the problems and accelerated scientific and technological progress. In the late 1960s and 1970s, Azerbaijan's agriculture flourished. The transition to a market economy based on the private economy, free enterprise, and free competition became necessary in the mid-1980s (Qəniyev H., 2017, s.38-39).

After gaining independence, Azerbaijan undertook a series of adjustments and self-improvement functions to complete the dissolution of the previous economic system with minimal losses. During the transition period, chaos, foreign intervention, the risk of the country's disintegration, the conditions of war, and the solution to the refugee problem in the country had to be achieved. The preservation of stability was critical in rebuilding the country's established economic practices. It was also critical to take part in the construction of economic bases appropriate to the market environment to repair economic and social relations (Aliyev İ., 2008:s.28-39).

Azerbaijan currently faces challenges as a result of its long colonial history. Some efforts must be made to improve Azerbaijan's statehood and complete the challenges that the state faces during the transition period:

- Make the transition to a free-market economy;
- Creating favorable conditions for all sorts of property;
- Promoting the growth of entrepreneurship;
- Improving food security;
- Attracting domestic and global investment to agriculture;
- Training of qualified personnel;
- Implementing contemporary technical innovations.

Nagorno-Karabakh and the surrounding Lachin, Kalbajar, Gubadli, Zangilan, Jabrayil, Aghdam, and Fizuli administrative regions of the Republic of Azerbaijan were occupied by Armenia from 1989–to 1993. Let's look at the main parameters of

the economic potential of the occupied territories. We can see that from the history of the occupation to the present day, everything that belonged to a living person was wholly destroyed. According to the interview of Doctor of Economics Vusal Gasimli, I would like to note that, during the occupation, 900 settlements, 150,000 houses, and apartments, 6,000 industrial, agricultural, and other facilities, 693 schools, 855 kindergartens, 798 healthcare facilities, 160 bridges, and other infrastructure facilities were destroyed. In addition, 280,000 hectares of forests, about 1 million hectares of fertile land, 127,700 hectares of irrigated land, 34,600 hectares of vineyards and orchards, and 1,200 km of irrigation system fell into the hands of the occupiers. Approximately 120,000 hectares of arable land in five districts outside the occupied territories remained unirrigated and practically removed from economic circulation. 220,000 heads of cattle were taken away by the occupiers (https://azertag.az/xeber/Vusal_Qasimli_Qarabagin_boyuk_iqtisadi_potensial_i_var-1620053).

A working group has been set up to analyze the losses and damage inflicted on our country by the occupying Armenian military units. Up to 40 percent of Azerbaijan's mineral water resources were in the occupied territories. The Upper and Lower Istisu, Bagirsag, Keshdek in the Kalbajar region, Iligsu, Minkend in the Lachin area, Turshsu, Shirlan, and other mineral waters in the Shusha region attract special attention. (https://azertag.az/xeber/Vusal_Qasimli_Postkonflikt_dovrunde_Qarabagin_senaye_istehsali_guclenecek-1624425).

Our country is fully supplied with electricity and even exported to other countries. Before the war, the power supply of Karabakh regions was carried out through the country's unified energy network. Earlier, electricity was supplied from Shamkir-Yenikend HPP on the Kura River. Electricity from the Aghdam power substation was distributed to the area via transmitters. As a result of the Armenians' occupation of our lands, electricity distribution networks and substations were sold abroad or destroyed (Müzəffərli N., İsmayılov E. 2010: s.117). In the 1980s, our state-

supplied the Karabakh economic region, including Khankendi, with gas. 2000 km of gas lines and 34 gas distribution facilities have been operated in the region.

The water reserves of rivers in the Karabakh region are 831.7 million cubic meters, and in East Zangazur, this figure is 1622.6 million cubic meters. In general, available water reserves are 2508.4 million cubic meters. This figure is 22% of the country's river water (Cəfərov Q. 2021). In the occupied territories of the Republic of Azerbaijan, there were three large hydropower plants: Tartar HPP, Khudafarin HPP, and Maiden Tower HPP. The Khudafarin HPP project in the Jabrayil region has been under Armenian control since 1992 as a result of the occupation of the region. Although Azerbaijan stopped the construction of the station, then Iran continued the construction work (<https://minenergy.gov.az/az/xeberler-arxivi/dagliq-qarabag-ve-etraf-regionlarin-enerji-potensialı>).

Before the occupation, seven stations were operating in Fizuli, from the Horadiz railway station to the border with Armenia. The stations include Agband, Minjivan, Hakari, Gumlag, Soltanli, Shukurbayli and Marjanli. There were also airports in Agdam and Fizuli, but they are not operational nowadays.

There were 620 health facilities in Karabakh and Eastern Zangazur before the occupation. It employs 8,000 medical staff and provides medical care to more than 15,000 patients. There were general and specialized inpatient health facilities, 55 rural field hospitals, 8 ambulance stations, 31 pharmacies, and 8 sanitary-epidemiological stations. There were more than 800 educational institutions in the region. There were 226 kindergartens and nurseries, 575 secondary schools, 12 vocational and secondary schools in the network of educational institutions. The network of socio-cultural facilities of our Karabakh and East Zangazur economic regions before the occupation is also shown in Table 2. There were 2262 cultural and household facilities, 89 houses of culture, 253 clubs, 415 libraries (Müzəffərli N., İsmayılov E. 2010: s.188).

At the time of Azerbaijan's independence, the country's self-sufficiency in meat and dairy products was about 30–35 percent; now, the country's self-sufficiency in these products has increased to 84.5 and 83.5 percent, respectively (https://www.stat.gov.az/source/food_balances/az/004_2.xls).

Table 2: Socio-cultural infrastructure facilities in the region before the occupation

	Cultural and household facilities	Houses of culture	Clubs	Libraries	Total
Aghdam	598	13	27	71	709
Jabrayil	197	10	49	58	314
Fizuli	415	20	45	69	549
Kalbajar	134	9	27	55	225
Gubadli	205	10	28	60	303
Lachin	575	19	54	67	715
Zangilan	138	8	23	35	204
Total	2262	89	253	415	3019

Source: Müzəffərli N., İsmayılov E. 2010: s.188

In these years, imports played a significant role in meeting the country's demand for potatoes. Still, now the level of self-sufficiency is 90.6 percent, and we currently export more than 40,000 tons of fresh potatoes annually. The level of self-sufficiency in all types of vegetables is 110.4 percent, and it is 116.3 percent in fruits and berries (https://www.stat.gov.az/source/food_balances/az/004_1.xls).

Before the occupation, the occupied territories provided about 35-40 percent of the agricultural products produced in Azerbaijan. There are more than 250,000 hectares of fertile land in Karabakh alone (Rəcəbli H. 2021: s.5).

Member of the Milli Majlis Iqbal Mammadov said that our liberated lands have great potential for agricultural development. During the occupation, only 7% of these territories were used by Armenians. The position of rivers, mostly in the north, and fertile fields in the south, along with the destruction of the existing irrigation infrastructure before the occupation, resulted in the unused areas. The yield was low, and only 10-12 quintals of grain were harvested per hectare. However, this figure was 21-25 cents before the occupation. Azerbaijan has significant potential for developing viticulture, tobacco, cotton, silkworm rearing, fruits and vegetables, vegetable garden

goods, and livestock in the liberated areas. Corn, peas, and grapes are typical crops of the region. In the pre-occupation period, the Fizuli and Aghdam regions were among the leading areas in the country for the production of cotton, grain, and grapes. Jabrayil, Gubadli, and Zangilan districts also differed in viticulture. Livestock was highly developed in Lachin, Kalbajar, Gubadli, and Zangilan. At the same time, there is potential for the development of the processing and food industries (Məmmədov İ. 2022).

East Zangazur economic region has a high potential for agricultural development due to its geographical location, rich natural resources and temperate climate zone. According to official data, during the SSR, the basis of the Gubadli economy was grain, livestock, tobacco, silkworm breeding, and viticulture. The region annually produced about 15,000 tons of grain, about 12,000 tons of feed, an average of 2,000 tons of tobacco, up to 1,200 tons of meat, and 2,000 tons of dairy products, and on average, 3,000 tons of grapes were sold to the state. One of the production areas was silkworm breeding, and 60-70 tons of silkworms were produced per year. Until the 1960s, the Gubadli region was also engaged in paddy farming.

Before the occupation, there were 4,039 hectares of forest, 58,585 hectares of arable land, and 1,079 hectares of gardens in the Jabrayil region. Two large irrigation canals in the area ensured the intensive development of agriculture. During the pre-occupation phase, the population was mainly engaged in viticulture, animal husbandry, grain growing, poultry, and silkworm breeding.

The Zangilan region is economically oriented to agriculture due to its location in the foothills of the republic. It covers 29 collective and state farms, one beekeeping farm, four cooperatives, and three peasant farms. There are 35,548 hectares of arable land in the region. 7,204 hectares were planted with annual crops, 2667 hectares with perennial crops, 207 hectares with hayfields, and 22,873 hectares with pastures. In Zangilan, there were 2,047 hectares of vineyards. There is one poultry complex with 12,000 birds in the region.

The majority of the more than 40,000 hectares of arable land in the Aghdam region was occupied, leaving Azerbaijan with only 17,000 hectares to cultivate. The region's economy was based on livestock, food production, beekeeping, and, partially, gardening. Until 1992, the public and private farms of the area had 40,211 heads of large horned animals and 244,000 heads of small horned animals, 44,235 bee families, and 1,470 hectares of fruit trees. Grain was planted on 3438 hectares, perennial grasses on 245 hectares, and potatoes on 31 hectares. In general, 29,500 out of 36,100 able-bodied people in the region worked in agriculture. Every year, 6,000 tons of milk, 5,000 tons of meat, and more than 400 tons of wool were sold to the state in the region (https://musavat.com/news/muharibe-qurtardi-bes-sonra_757072.html).

Generally, the potential for agricultural transformation in the liberated territories is enormous. To fully realize this potential, it is necessary to begin using relevant procedures as soon as possible. Karabakh will contribute to the expansion and diversification of the Azerbaijani economy after the liberation of our occupied territories. Azerbaijan won its 44-day war, restored its territorial integrity, and entered a new stage of development. The construction and restoration work carried out in Karabakh will bring many innovations to the life of our country.

CHAPTER II. THE ANALYSIS OF THE CURRENT SITUATION OF THE AGRICULTURAL SECTOR AND LIVELIHOODS

2.1. The current situation of agriculture and livelihoods in our country.

Assessing Jabrayil`s potential through analysis

In liberated lands, the "Great Return" continues. First, measures for removing dangerous substances must be taken in the liberated areas, communications must be established, and housing and production must be provided. The Fizuli-Shusha road's and Fizuli airport's construction has already begun, and the foundation of the Horadiz-Zangilan-Agband railway has been laid. Also, the Gulabird Hydroelectric Power Station was launched in the Lachin region, and the first stage of electricity supply to Shusha has been completed. The world's most advanced technologies aim to stimulate the use of alternative energy and ensure ecological balance. For this purpose, there are opportunities to use wind energy in the Lachin and Kalbajar regions and solar power in the Zangilan and Jabrail regions. The rapid implementation of measures in the liberated territories shows that Karabakh will soon become one of Azerbaijan's most substantial economic zones. The part of Karabakh, which is planned to be restored as a "Green Energy" zone, will be one of the most modern settlements in the world. Programs are being developed to help residents returning to their homes find work. Along with restoring traditional employment, creating new types of employment is also part of the plans prepared by the state. Thus, there is no doubt that the new conditions created in the region due to Azerbaijan's victory promise good prospects for our country and the region (Əliyev İ., Qocayev M. 2021: s.1,5).

Restoration work has already begun on the liberated lands, and funds have been allocated from the state budget. At the same time, by the Decree of the President of the Republic of Azerbaijan İlham Aliyev dated January 4, 2021, the "Karabakh Revival Fund" was established to ensure a modern and decent life for sustainable

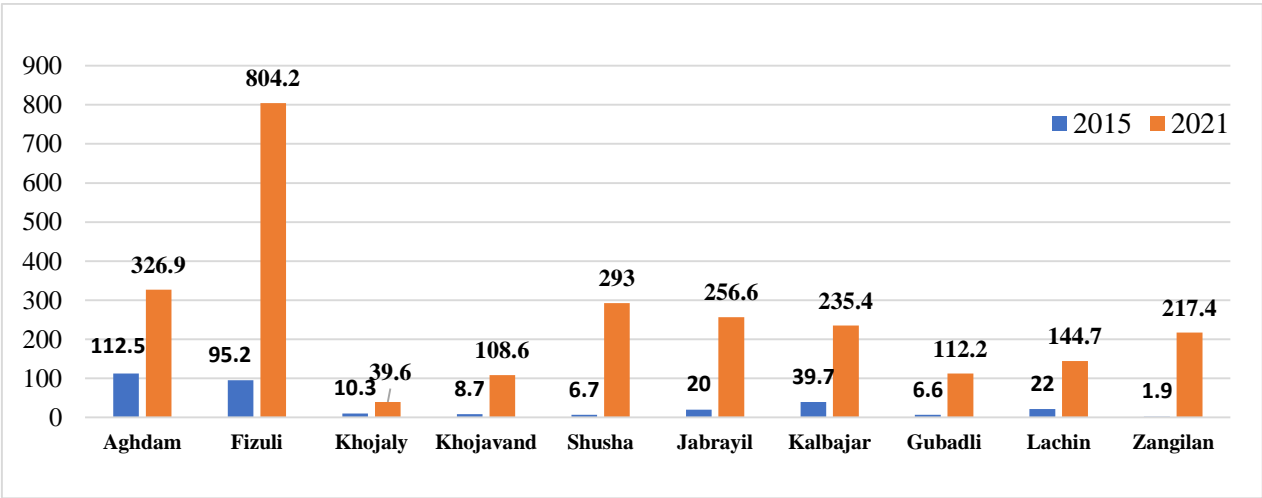
settlement in the liberated territories, to carry out construction and restoration work in all areas, as well as to support safe living, productive activity, and sustainable growth. This fund is a public legal entity that provides financial support and investment in the measures taken to restore and rebuild the liberated territories of the Republic of Azerbaijan, transform them into a region with a sustainable economy and high prosperity, to develop public-private partnerships in this area, and to carry out the necessary propaganda work within the country and abroad. The decree emphasizes that by liberating the territories of the Azerbaijani people from Armenian occupation, they have entered the most memorable and glorious period of their history. In the settlement, decent living and economic activity will be provided in the liberated areas. The construction and restoration work to be carried out in these areas will be an essential stage in the new development process of Azerbaijan. It will further strengthen the foundations of the socio-economic development of our country (<https://e-qanun.az/framework/46628>).

Some friendly countries have expressed their desire to participate in restoring our liberated territories. The Azerbaijani state has also announced its intention to cooperate with friendly countries in this field. Concrete cooperation has already begun with foreign companies in construction work in Karabakh. Thus, in order to create electricity infrastructure in the liberated territories of Azerbaijan, a supply agreement was signed between "Azerenergy" OJSC and the Italian company "Ansaldo Energia" in the field of cooperation. A high technology park will be established in Karabakh. According to the Memorandum of Cultural and Scientific Cooperation signed between the GOSB Technopark in Turkey and the Azerbaijan Innovation Agency, the park plans to conduct the latest "soft" and "hard" scientific research in the production of high-tech devices. Azerbaijani and Hungarian companies discussed the participation of Hungarian companies in the restoration of territories in Karabakh. Hungary has offered a 25,000-euro grant to clear mines as part of the war. Hungary's EximBank has opened a \$100 million credit line for

Hungarian companies intending to participate in the reconstruction program. The United Kingdom said it could assist Azerbaijan in clearing the liberated territories of Karabakh of mines and unexploded ordnance (Bayramov V. 2021).

Chart 1 compares the output of our liberated lands in 2015 and 2021 by key sectors of the economy. We can see from the graph that in 2021, the most extensive output was in the Fizuli region and increased by 8.45 times compared to 2015. The total output of the main sectors of the economy in the economic regions of Karabakh and East Zangazur amounted to 3,799 million manats. Most of the gross output of these two economic regions falls in Fizuli, Barda, and Agjabadi regions, which are 21.17%, 15.75%, and 12.59%, respectively. The lowest percentage of gross output is in Khojaly, Khojavend, and Gubadli, at 1.04%, 2.86%, and 2.95%, respectively.

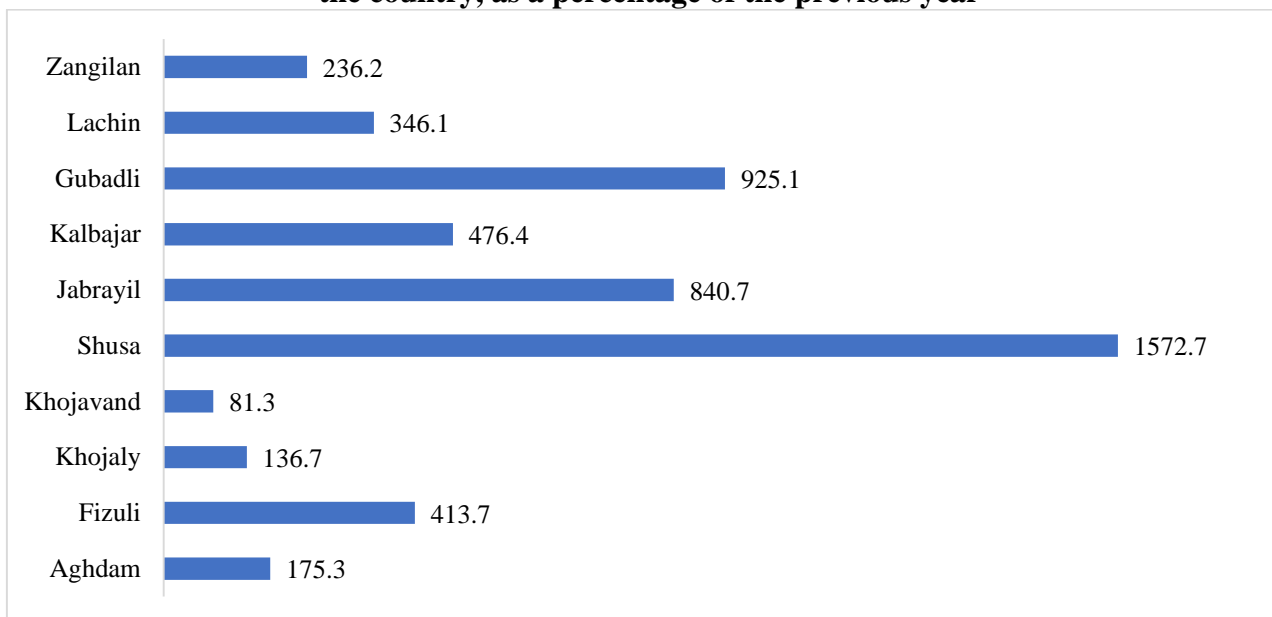
Chart 1: Output in the main sectors of the economy in the regions of the country, in million manat



Source: State Statistics Committee of the Republic of Azerbaijan, 2022
https://www.stat.gov.az/source/system_nat_accounts/az/034.xls

The physical volume indices of the main sectors of the economy compared to the previous year for the liberated regions of the republic are shown in Chart 2. The highest index was 1527.7 percent in Shusha and the lowest index was 81.3 percent in Khojavend. The volume index of production in Jabrayil was 840.7% compared to the previous year.

Chart 2: Physical volume index of output in the main sectors of the economy in the regions of the country, as a percentage of the previous year



Source: State Statistics Committee of the Republic of Azerbaijan, 2022

https://www.stat.gov.az/source/system_nat_accounts/az/034.xls

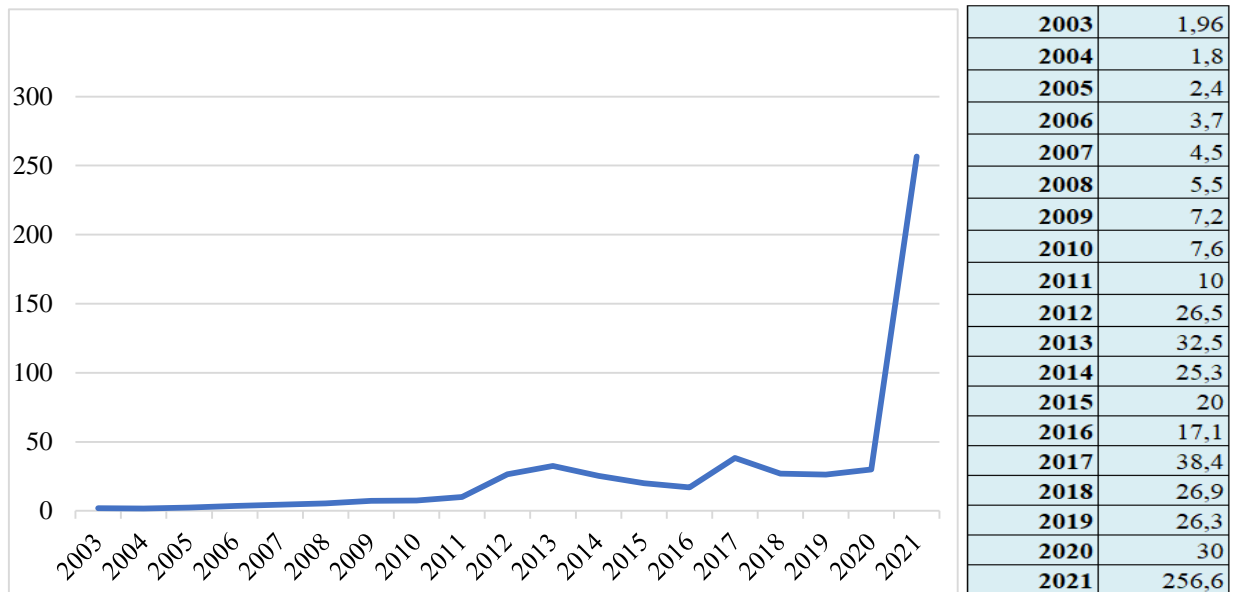
The relief of Jabrayil is mainly a sloping plain with low mountains in the north. The climate is mainly temperate with a dry summer. It has several small rivers belonging to the Araz River basin. Jabrayil has rich vegetation, which is typical for semi-deserts. The district borders Khojavend in the north, Iran in the south, Fizuli in the east, and Gubadli and Zangilan districts in the west. It is located on the Baku-Shirvan-Nakhchivan highway. The territory of Jabrayil is 1,050 kv.m with a population of 82,200 people (as of January 1, 2021). There are 77 settlements and villages, and the capital is Jabrayil. It was occupied on August 23, 1993. As a result of this occupation, 77 settlements and villages, 197 cultural and household facilities, and 27 historical monuments were destroyed, burned, and looted by Armenian vandals (Müzəffərli N., İsmayılov E. 2010: s.54-55).

Viticulture, grain growing, tobacco growing, animal husbandry, cocoons, fruit and vegetable growing play an important role in Jabrayil's economy. Carpet weaving was also developed in the industry of the region. One of the most important

architectural monuments connecting North and South Azerbaijan, Khudafarin, is located here.

Chart 3 compares the volume of gross output of the Jabrayil region between 2003 and 2021. The weakest indicator during these years was observed in 2004, the total output was 1.8 million manats, and the highest figure in 2021 was 256.6 million. Compared to 2003, the total output in 2012 increased by 13.52 times and amounted to 26.5 million manats. After the liberation of Jabrayil, 8.55 times more products were produced than in the previous year.

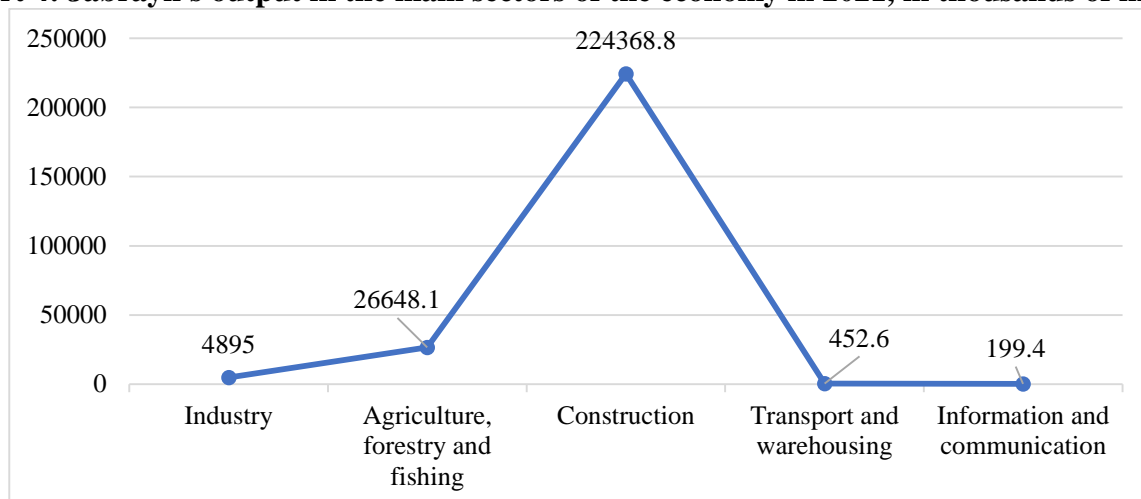
Chart 3: Jabrayil's output in the main sectors of the economy, in million manat



Source: State Statistics Committee of the Republic of Azerbaijan, 2022
https://www.stat.gov.az/source/system_nat_accounts/az/034.xls

In 2021, the output of Jabrayil in the main sectors of the economy amounted to 256.6 million manats. Chart 4 illustrates that industry accounts for 1.91% of output, agriculture, forestry, and fishing for 10.37%, construction for 87.45%, transport and warehousing for 0.18%, and information and communication for 0.08%. According to the indicators, Jabrayil has a great potential for developing the construction sector; most of the total amount belongs to this sector and is equal to 224.4 million manats.

Chart 4: Jabrayil's output in the main sectors of the economy in 2021, in thousands of manats



Source: State Statistics Committee of the Republic of Azerbaijan, 2022

https://www.stat.gov.az/source/system_nat_accounts/az/034.xls

Table 3 shows the level of production of Jabrayil in the last 20 years in general agricultural areas. During the war, Jabrayil's agriculture was severely damaged. In 2001-2005, almost all agricultural indicators in the region were very weak. During the years of occupation, our arable lands became unused and useless.

Table 3: Average annual production of all categories of agriculture in Jabrayil, thousand tons

	2001-2005	2006-2010	2011-2015	2016-2020
Grain	1.77	6.82	7.33	8.56
Cereals and legumes	1.89	6.82	7.42	9.06
Vegetables	-	0.37	0.59	0.99
Potato	-	0.31	0.43	0.51
Tomato	-	0.19	0.32	0.52
Onion	-	0.17	0.25	0.27
Melons	-	0.08	0.07	0.07
Fruits and berries	-	-	1.15	1.23
Grapes	-	-	0.19	0.18
Sugar beet	-	0.58	0.55	0.52
Meat	0.39	0.50	0.83	1.14
Milk	3.55	4.09	5.99	7.92
Egg (million units)	1.43	2.11	3.60	5.05
Wool	0.12	0.11	0.13	0.16

Source: State Statistics Committee of the Republic of Azerbaijan, 2022,

<https://www.stat.gov.az/source/agriculture/>

After 2006, we can see the development of agriculture. From ancient times, mainly fruit, vegetable, cattle breeding, grain, and grape fields have great potential in the region. According to the table, compared to previous years, grain production increased 4.84 times, vegetable production 2.68 times, potato production 1.65 times, and onions 1.59 times. Livestock indicators have increased sharply over the years. Meat production increased 2.92 times, milk production 2.23 times, egg production 3.53 times, and wool production 1.33 times. In our liberated lands, we will see a rapid increase in these indicators in the next 5-10 years.

2.2. Advance the development of agriculture and livelihoods through digital transformation in Azerbaijan

Artificial Intelligence (AI), one of the main results of the Fourth Industrial Revolution, affects socio-economic governance. In order to regulate the role of artificial intelligence capabilities applied in different areas of general state policy, digitalization and AI should be given a significant place in macro policy. The development of AI should be aimed not only at achieving the country's scientific and technological achievements but also at improving the country's socio-economic environment. According to the 2020 report of the e-Government Development Center, Table 4 compares the statistics for 2019 and 2020.

Table 4: Use and number of users of the e-government portal in the Republic of Azerbaijan for 2019-2020

	2019	2020
General use of the portal	122 276	3 507 143
The number of users	41 520	447 280
Notifications	82 000	3 249 000
Number of services used in total	739 000	11 530 000

Source: E-Government Development Center, <https://www.digital.gov.az/presentation/ehim-2020.pdf>

Using of AI in public administration has positive and negative effects. First of all, it should be noted that digitalization in public administration has brought relief from a corporate and social point of view. AI tools are used in public administration in the following sectors: 1. health care; 2. education; 3. transportation; 4. payment systems; 5. law; 6. agriculture; 7. social services, and so on.

President Ilham Aliyev said that cities and villages in those territories would be built with "Smart City" and "Smart Village" projects, considering best practices. Applying these concepts is reflected in the National Action Plan for the Promotion of Open Government for 2020–2022. Simultaneously, it is planned to apply this concept in other regions (Raufqızı 2021; Rzayev S. 2021: s.301).

"Smart Village" projects are being implemented in various countries around the world. The main goal of the project is to facilitate the lives of villagers and improve their living standards. What is the concept of "Smart Village"?

This concept is the application of modern technology and innovations to the daily living conditions of people in the village. It also accelerates the implementation of sustainable development goals in remote areas of the country. As a result, it develops economic, social, environmental, agricultural, and public relations between the regions in accordance with modern standards. Digital technologies can be applied to many areas of living and working conditions in rural areas. The Smart Village concept helps to improve services in both the public and private sectors and to develop short-term food supply chains and renewable energy sources. Through this model, governments aim to increase the efficiency and security of public services, reduce financial costs, and ensure transparency and good governance (Əliyev A. 2021).

Practices shape the future of agriculture. Reaching into the future dates back to 20th agriculture. These are the programs that use the fundamental characteristics derived from the initial agricultural material. By the late 1950s, synthetic pesticides, fertilizers, and more efficient machinery had reduced production costs. As a result, we have entered the Agriculture 2.0 epoch known as the Green Revolution.

Efficiency rose as a result of low-cost inputs and new tools. Agriculture 3.0, which began in the 1990s, is now more popularly known as "Precision Agriculture." The primary technologies used during this time include manual guiding via GPS technology, and VRA 73 (Variable Rate Application) applied to harvesters, particularly tracking the fertilization process. In the 2010s, Industry 4.0 began to be experienced in the agricultural sector. This process is called "Agriculture 4.0, Smart Agriculture, Digital Agriculture, E-Agriculture, " generally refers to the application of intelligent technologies, including sensors, microprocessors, autonomous decision systems, and cloud-based information and communication technologies, in the agricultural sector. Large volumes of data can be stored and analyzed using internet-based portals and algorithms. Agricultural 4.0 emphasizes the significance of the environment and the collaboration of many actors in the agriculture and food value chain. Technologies used in Agriculture 4.0: It covers the activities of suppliers, producers, breeders, intermediaries, and technology providers, i.e., different actors working in the agricultural sector. The activities of all these actors can be brought together via the Internet of things, big data, and clever algorithms (Bilgi Teknolojileri ve İletişim Kurumu, 2020: s.35-37).

In international practice, a "Smart Village" means the solution to the main problems faced by the rural population and the creation of new economic opportunities in rural areas. Applying the concept of "Smart Village" in the liberated areas can also reduce the likelihood of a circle of decline. Also, the application of "smart-village" technologies in these areas will create conditions for the spread of startup-type micro-and small businesses among the rural population. A Smart Village would mainly concentrate on e-literacy capabilities, availability of e-health, high-quality education, clean water, sanitation, finance, and other public needs; technical ideas for environmental issues, improved livelihoods, application of circular economy to agricultural waste, development of local product and service automation and ICT, implementing and making full use of intelligent specialized agro-food projects,

ecotourism activities, and so on. Infrastructure and energy are of great importance in the development of this concept. In rural areas, energy is essential for both education and communication. For example, a smart village will allow students to easily access any information on the Internet. Therefore, in health care, clinics require more light, and it is necessary to use the sun as an alternative energy source. In addition, with the establishment of Smart Health Care, the process of information exchange, monitoring, and inspection is connected to the Internet, and everything is managed remotely (Bilgi Teknolojileri ve İletişim Kurumu, 2020).

The application of "smart city" and "smart village" technologies can turn the Karabakh region into a pearl of tourism and, at the same time, an innovation-startup factory in Azerbaijan. I want to note that Azerbaijan already has experience in the smart village project. Thus, during his visit to the Gakh region in November 2018, President Ilham Aliyev was presented for the first time with the "Smart Village" project planned to be established in the country (Əliyev A. 2021).

The body that will implement this idea in Azerbaijan is the State Service for Management of Agricultural Projects and Loans under the Ministry of Agriculture. The main objectives of the Smart Village project are:

- Reducing the number of people moving from rural to urban areas;
- Providing opportunities for people in the village to earn money;
- Access of rural residents to public services.

The "Smart Village" project, which will be implemented in the First, Second, and Third Agali villages of the liberated Zangilan region, includes several components. The statement came from Akbar Abbasov, head of the Agrarian Innovation Center of the Ministry of Agriculture (<https://azvision.az/news/261289/>). The main components are listed below:

- Complete development of smart technologies in everyday life;
- Digitalization of social services;

- Developing the knowledge and skills of the villagers in the use of technology;

- Increasing the production process in the region;
- Establishing smart agriculture;
- Using of alternative energy sources.

The Information Technology and Communication Agency's "Smart Agriculture" study in 2020 provides detailed information on the technologies used in smart agriculture. The application of these technologies in the agricultural sector of Karabakh can improve the following areas:

- Agricultural machines and fields will be equipped with sensors;
- Agricultural vehicles will be connected;
- Due to sensors, humidity, vegetation, temperature, steam, and weather conditions can be measured;
- Satellite images will be processed and combined with data from sensors;
- Cloud-related drones will monitor all agricultural areas, and the information obtained can be tracked with intelligent devices;
- Using GPS technology, farmers will be able to pinpoint the exact location of soil type, pest formation, weed infestation, water holes, borders, and barriers;
- With the use of robots and AI, more crops can be grown faster and healthier;
- Resources will be tracked from the time they reach the farm to when the product is put on the market. There will also be an RFID sensor and tracking system where buyers can track the process from the field to the point of purchase.

The representative of the Ministry of Agriculture, Togrul Gafarbeyli, said that "Smart Agriculture" provides management and control of the cooperative management system, fields, gardens, and farms, drones based on modern technologies (<https://525.az/news/167200-qarabagda-birinci-agilli-kend-munasibet>). "Smart"

farms allow us to increase the production of fruits, vegetables, meat, and dairy products in rural areas and build the processing process in accordance with modern requirements. The effects of the "Smart Village" application on livelihood are as follows:

- Application of modern urban planning standards;
- Smart street lighting;
- Construction of ecological houses resistant to heat and cold;
- Household waste management;
- Installation of hydroelectric power plants, solar panel stations, use of biogas energy;
- Construction of modern schools, kindergartens, clinics, and e-government centers;
- Formation of tourism infrastructure.

The positive effects of the "Smart Agriculture" project on the agricultural sector around the world are:

- The use of manual labor has been reduced to a minimum;
- Modern technologies are used in the agricultural sector;
- Cultivation of arable lands is carried out by drones;
- Harvesting is carried out using computerized equipment;
- Modern irrigation systems are used to save water resources;
- Operations are managed from one center.

As a result, technology allows us to save resources, optimize costs, and increase revenue. With the help of this project, the living conditions of people returning to Karabakh will improve. It will play an important role in integrating our farmers into the "smart agriculture" system.

New projects have already been proposed for construction work in our liberated lands. One of them is the "Xari bulbul" construction project. Architect Akbar

Mammadov has designed this construction project to rebuild a life in Karabakh. In the first stage, he developed an innovative settlement project consisting of 1,200 houses. The total construction area, including the renovated capital construction projects (220 hectares), is 780 hectares, and the length, including the restored ones, is 9.2 kilometers. One of the advantages of Smart Settlement is the availability of three main "smart" systems (climate control, life safety, and risk analysis) and alternative energy sources (wind energy, bio, and solar energy) to optimize costs, household needs, settlement maintenance, and land use. are plans for development dynamics. Such innovative solutions will accelerate the development of the settlement's agricultural activities and access to world markets. It is also planned to partially reconstruct the destroyed houses using the remaining elements at the project site. Also, some old roads will be restored, some roads and streets will be rebuilt, and a junction of old and new roads will be created. The construction of a new airport near the settlement will accelerate the transformation of the area into a city. Administrative, household, trade, catering, health, culture, recreation, indoor greenhouse innovation, and research institutions will be reconstructed in the settlement. There are three schools and three kindergartens in the settlement, with a covered sports center (<https://www.trthaber.com/trtvotworld/azerbaycan/qarabagda-xari-bulbul-innovativ-insaat-layih-si-1623610.html>).

Caspian Agro 2022 is one of the events that will promote the development of "Smart Village" and "Smart City" concepts in our country. The exhibition will be held May 18–20 with the support of the Ministry of Agriculture of the Republic of Azerbaijan. It offers Smart Agro, covering Smart Village, Internet of Things, AI, IT Services, Unmanned Aerial Vehicles (Drones), and Robot Complexes. Companies from Azerbaijan, the United States, Georgia, the Netherlands, Spain, Israel, Italy, Russia, Turkey, and Ukraine will participate in the exhibition (<https://caspiagro.az/az-opennews/9067.41.html>). The events planned at the exhibition are listed below:

- Innovative technologies in agriculture will be discussed;

- Business meetings will be held between entrepreneurs and exhibitors;
- Projects planned to be implemented in the liberated territories of Karabakh will be presented;
- Smart Agro directions will be presented.

It is important to study and apply the experience of other countries to properly apply modern technologies in agriculture and the development of livelihoods to achieve high results in a short time and make Karabakh the most modern place in the world.

2.3. Using foreign countries` experience in creating modern agricultural and livelihood systems

The Smart Village project is widely used to prevent shortages in agricultural production and prevent the evacuation of villages. This practice is prevalent in Europe. As a result of negative demographic growth, villages are rapidly emptying. Today, the Smart Village project in Europe is mainly used in Scotland. The Smart Village Scotland platform has been created for this program. This platform aims to stimulate the rapid development of smart villages in rural areas of Scotland through the application of technology in large cities. A unique website has been created to increase local business and social activity. The Smart Village Scotland platform was created with the government's goal of taking full advantage of Scotland's potential in the digital world (Əliyev A. 2021).

If we look at history, we can name Germany and Japan as countries with intense and rapid economic development in the short period after the war. Executive Director of the Center for Economic Reforms Analysis and Communication (CERAC) Vusal Gasimli interviewed AzerTaj on the reconstruction work in Karabakh (https://azertag.az/xeber/Vusal_Qasimli_Qarabagin_boyuk_iqtisadi_potensial_i_var-1620053). He said, “Forest, water, and land resources in the liberated areas create great opportunities for the development of agriculture, processing industries, and tourism.

There, the economy will be restructured, and new technologies will be introduced, which will make the economy more productive. After World War II (WWII), the two most devastated countries, Germany and Japan, grew faster as new technologies were introduced and economic productivity increased.”

After WWII, in 1947, the US Congress adopted the European Reconstruction Program, known as the Marshall Plan. This plan's heart was a budget support program for the reconstruction and development of war-affected European countries. Half of the US aid was spent on developing European agriculture and its equipment. The total amount of aid was \$4.4 billion in two years (Thierry Giordano, 2011: p.46).

There were three main reasons why the reconstruction of Europe after WWII was so successful. The first was to prioritize agriculture as a decisive factor in the process of European reconstruction. Second, the support of the United States as a foreign actor should be emphasized. The last was the drafting of the Marshall Plan. As a result of the Marshall Plan and other government programs, agriculture in Europe was soon restored with good results. After the war, West Germany's economy and agriculture were in a very bad state (Hubert G. Schmidt, 1955; Fikrətzadə F., Hacıyeva S. 2020: s.25). The plan included the following steps for the restoration of German agriculture:

- Increasing grain, fodder crop, and hay productivity;
- Raising milk production and improving product quality;
- Improving animal feeding efficiency;
- Implementing agricultural mechanization.

Following these measures, agricultural production in West Germany increased rapidly. Between 1949 and 1952, Germany's agricultural output was much higher than before the war. In those years, farmers benefited from state support, and the amount of aid from the US was adjusted to the country's budget. It should be noted that this increase is due to the application of intensive production methods. Thus, in

1953, only one-third of the total land area of West Germany consisted of arable land and the rest of the pastures and meadows.

According to another study, the Israeli experience is especially important for developing the agricultural sector, although only 20% of its territory is suitable for agriculture. With the application of modern technology and innovation, the desert has been transformed into a high-yielding field of agriculture. Israel has now become the world's most powerful agro-industrial country. It is a producer of the highest quality products, especially in seed production, agriculture, horticulture, citrus fruits, grain, sugar beet, and viticulture (H. Çakan, 2017). There are two types of farming in Israel: kibbutz farming and moshav farming. A moshav is a privately owned cooperative farm. A kibbutz is a farm where the utility system is fully inhabited, and there is no private property. While the owners of Moshav provide their transfers entirely based on agriculture, the owners of Kibutz are engaged in industrial production outside their field. Land in Israel is state property, and those who want to farm are leased for a long time - 49, 99 years. Entrepreneurs pay land tax every year and are free to produce. The land sale is prohibited, but the lessee may lease the land to another person. Upon expiration of the lease, the state may take back the land or extend the lease.

Compared to other developed economies, Israel has a well-developed infrastructure in many areas, such as education, health, transportation, and justice. The reasons for the development of Israel's agriculture are the importance of technology and the right agricultural policy. Israel has developed drip irrigation to minimize water and maximize the benefits of water to plants. In addition to gains in the drip irrigation industry, the export of materials and pipes needed for the technology will provide an additional \$500 million in aid to the Israeli economy and open the door to international cooperation.

Between 2014 and 2018, Israel agro-technology companies earned \$ 759 million with more than 250 investments. Azerbaijan has been applying Israel's agricultural

experience since 2014 (Həsənli M. 2021). The agro-parks promoted by President İlham Aliyev are very similar to the Israeli Kibbutz collective production organization. The merging of various farms into agro-parks and equipping them with the most modern equipment has led to increased productivity, new job opportunities, and increased competitiveness of local companies in the domestic market.

Given the development of viticulture in our country in recent years, it is important to pay attention to the experience of France. In France, a significant part of arable land is in the hands of entrepreneurs. The primary forms of farming are farmers and cooperatives. Entrepreneurs are free to produce the agricultural products they want, but they accept them on government orders. In France, viticulture is considered one of the most profitable and popular industries. Entrepreneurs are mainly engaged in viticulture, and in this case, along with the quantity of the product, special attention is paid to quality because a quality product becomes more competitive (<http://www.geostrategiya.az/news.php?id=125>).

We are currently receiving foreign support for the development of our liberated lands. In February 2022, the European Union (EU) and the World Bank (WB) signed an Administrative Agreement for the Azerbaijan Rapid Technical Assistance Mechanism (AZTAF). The program will allocate 5.25 million euros and be used following Azerbaijan's National Priorities 2030 (The World Bank, 16.02.2022). The project will be implemented over three years in 4 strategic directions and nine areas of activity defined by the EU for Azerbaijan. An international financial institution such as the WB is also interested in restoring our liberated territories and creating a high-tech economy.

Based on the above experience, it can rapidly develop the territory of Karabakh, which has high agricultural and living potential. Success can be achieved quickly if the state develops appropriate policies, applies appropriate state mechanisms, and successfully implements the advantages of modern technology and innovation.

CHAPTER III. SUSTAINABLE DEVELOPMENT OF AGRICULTURE AND LIVELIHOODS IN MODERN CONDITIONS: JABRAIL AS A CASE STUDY

3.1. Priorities of government support for the future development of agriculture and livelihoods: Jabrayil as a case study

Thanks to our state's constant care and support, the dynamic and sustainable development of agriculture, an important sector of the country's economy, has been ensured. President of the Republic of Azerbaijan Ilham Aliyev has identified achieving complete independence in food security as one of the national goals. As stated by the President, "the main goal now is to bring Azerbaijan to the level of developed countries, achieving self-sufficiency and sustainable development in agriculture and food products through domestic resources." The existing potential in the country fully guarantees the implementation of this strategy.

Regarding economic recovery in the liberated lands, Vusal Gasimli said that Azerbaijan has considerable experience in restoring the liberated territories. Even the Agency for Rehabilitation and Reconstruction of Territories has been established in our country, whose mission is to coordinate the restoration work and create conditions to return obligatory refugees to their native lands. From 2020, the territories liberated by the Azerbaijani Army from the enemy will be restored accordingly. After the successful Horadiz operation in 1994, 42 settlements in the Fizuli region were revived. After the military victory in April 2016, the village of Jojug Marjanli in the Jabrayil region became the starting point of the Great Return. As a result of the state's attention and care, the village of Jojug Marjanli has quickly become a modern and prosperous settlement. For this purpose, the President of Azerbaijan has signed several orders. Jojuq Marjanli is more successful than any other occupied village and is provided with jobs and social services at a higher level. Reconstruction of the 29-kilometer roads leading to the newly liberated villages of Sugovushan and Talysh in the Tartar region have already begun (Cəfərli R. 2020).

As a result of the measures and policies implemented by our state, the development of agriculture and livelihoods continues rapidly. The development of the non-oil sector and ensuring high growth is the basis of the state's economic policy. Measures that play an essential role in public policy for agricultural development include:

- Ongoing reforms;
- Modernization of the agrarian sector;
- More flexible application of intensive development mechanisms;
- Improving the material well-being of farmers.

In order to improve the food supply in our country, the legislative framework has been strengthened. In addition, farmers were provided with 50 percent of the cost of fuel, motor oil, and fertilizer by the state and subsidies for grain crops. Technical support has also been improved by providing machinery and fertilizers to producers on preferential terms. Reforms in the agricultural sector and the definition of strategic goals in line with new challenges have had a significant impact on the sustainable development of agriculture. It has led to a qualitative change in the agricultural sector and a number of steps have been taken to create favorable conditions for strengthening the processing industry. These include:

- The introduction of e-government;
- Optimization of public services;
- The establishment of an effective management system.

On October 4, 2021, President Ilham Aliyev signed a decree on establishing the "Araz Valley Economic Zone" Industrial Park in Jabrayil (<https://e-qanun.az/framework/48328>). Perspective opportunities have been created to develop transport links between the liberated territories and the Nakhchivan Autonomous Republic. The sustainable settlement, economic activity, and transport options in these lands will also expand regional economic and trade relations. The Arazboyu

area of East Zangazur has mainly plain relief. Also, the opening of a border checkpoint in the direction of the historic Khudafar bridges in Jabrayil will be more effective with the launch of the industrial park. At the same time, establishing a logistics center, various services, innovative industries, and enterprises for the production of construction materials in the Jabrayil region will be helpful in the restoration of other liberated areas. Initially, 500,000 manats were allocated for the construction of the Industrial Park and the creation of infrastructure in its territory. The industrial park to be established in the Jabrayil region will cover an area of 200 hectares. For the implementation of the project, it is necessary to have electricity and heat, gas, water, sewerage, communications, transport, fire protection, production, administrative, social, and other infrastructure facilities in the region. The decree also instructed to determine the priority areas for services to be provided in the Industrial Park, manufactured and processed industrial products, and to completely clear them of mines and explosive remnants to create infrastructure in those areas (<https://apa.az/az/official-news/prezident-ilham-eliyev-araz-vadisi-iqtisadi-zonasi-senaye-parkinin-temelini-qoyub-664430>).

It is also planned to operate the following areas in the park:

- Packaging of agricultural products;
- Making of canned fruits and vegetables;
- Production of dairy and meat products;
- Manufacturing of wine, feed, and fertilizer;
- Construction of silk factories, and refrigeration chambers;
- Creation of small production and service areas.

As there is no settlement near the Industrial Park, a container town for 150 people will be built in the social zone. The campus will house office buildings for the park's management and residents, administrative buildings, residential buildings and service facilities for residents, construction engineers and workers, a medical center,

a sports field, and other infrastructure. The implementation of this project will give a great impetus to the reintegration of the region's potential into the country's economy, the development of local production, and create additional opportunities to increase employment.

3.2. Analysis of the area according to past statistics on agriculture and livelihoods

Since 1996, Azerbaijan has been successfully reforming the transfer of arable land to the private ownership of peasants free of charge. But it was not possible to implement these reforms in our occupied lands. Therefore, the implementation of successful land reforms in these areas and the establishment of economic activities based on the activities of the private sector is one of the main tasks. As a result, using the experience of other countries in the post-conflict period, we can group the issues of agricultural rehabilitation in our liberated lands into the following areas:

- Carrying out planning for efficient use of land and water resources;
- Land reform and rehabilitation measures;
- Construction of livestock farms with modern equipment;
- Organization of agro-technical services, a supply base of seeds, fertilizers, and pesticides;
- The creation of a logistics infrastructure for product supply and trade;
- Building of agro-processing enterprises;
- Training of agricultural specialists and organization of an information consulting service;
- Development and implementation of a specific state support mechanism.

Each of these 7 areas is characterized by a wide range of issues related to the gradual restoration and development of the liberated territories (Fikrətzadə F., Hacıyeva S. 2020: s.27).

The damage caused to the economy of our country by the Azerbaijani-Armenian conflict is great. In particular, agriculture has suffered greatly. Restoration of agriculture in our liberated lands is one of the main tasks before us. The following Table 5 is an overview of the damage caused to agriculture by wars and the world experience in the restoration of agriculture in post-conflict zones (Fikrətzadə F., Hacıyeva S. 2020: s.26). On this basis, directions for the restoration of agriculture in the liberated territories of Azerbaijan were identified as follows:

Table 5: Damage caused to agriculture by conflicts/wars and directions of agricultural recovery in post-conflict zones

Negative effects of conflicts/wars on agriculture	Framework for post-war reconstruction of agriculture
Soil degradation and destruction of plant genetic resources	Rehabilitation of lands and implementation of reforms
Destruction of agricultural machinery and equipment	Formation of supply networks for agro-technical services and means of production
Seeds, fertilizers, pesticides, etc. supply system failure	Establishment of supply channels and warehouses
Loss of agricultural specialists	Training of agricultural specialists and organization of information and consulting services
Destroying of food warehouses	Supporting the creation of revenue sources by value chains

Source: Fikrətzadə F., Hacıyeva S. 2020: s.26

The quantity of investment in economic growth was essentially non-existent in the early years after Azerbaijan's independence. As a result of successfully implemented government programs, the non-oil sector investment has increased yearly. Table 6 shows the statistical indicators of the amounts invested by the government.

Azerbaijani state in various sectors of the economy from 1990 to 2020. In 2020, 9065.3 million manats were invested in the industrial sector, 520.6 million manats in agriculture, 3178.5 million manats in construction, 2092.6 million manats in transport

and warehousing, 185.5 million manats in information and communication, and 2183.6 million manats in other areas.

Table 6: Fixed capital investment in sectors of the economy, million manat

Years	1990	1995	2000	2005	2010	2015	2019	2020
Industry	0.02	105.9	670.1	4176.0	4276.2	8499.9	9258.0	9065.3
Agriculture, Forestry and Fishing	0.02	4.4	6.5	40.7	431.0	355.4	769.5	520.6
Construction	0.00	0.6	3.4	46.1	113.8	2123.5	3550.4	3178.5
Transport and Warehousing	0.00	12	44.1	517.2	2449.1	2199.9	2190.7	2092.6
Information and communication			45.3	158.0	212.0	335.3	547.1	185.5
Other areas	0.02	105.1	198.4	831.9	2423.6	2443.0	2223.8	2183.6
Total	0.06	228.0	967.8	5769.9	9905.7	15957.0	18539.5	17226.1

Source: State Statistics Committee of the Republic of Azerbaijan, <https://www.stat.gov.az/source/agriculture/az/1.7.xls> (30.12.2021)

In 2020, the country's gross domestic product amounted to 72578.1 million manats. As can be seen from Table 7, 32.62% of GDP was allocated to industry, 6.74% to agriculture, forestry, and fishing, 7.88% to construction, 9.25% to transport and communication, and 34.07% to other sectors.

Table 7: Gross Domestic Product by sectors of the economy (at the end of 2020)

	Indicators	million manats	percentage by weight
	Total	72578.1	100%
1	Industry	23676.6	32.62%
2	Agriculture. Forestry. and Fishing	4891.0	6.74%
3	Construction	5718.5	7.88%
4	Transport and communication	6713.2	9.25%
5	Net taxes	6848.4	9.44%
6	Other areas	24730.4	34.07%

Source: State Statistics Committee of the Republic of Azerbaijan, https://www.stat.gov.az/source/system_nat_accounts/az/014.xls (30.12.2021)

Net product and import taxes amounted to 9.44 percent of GDP. According to statistics on GDP in the sectors of the Azerbaijani economy, agriculture, forestry, and fisheries account for 4891.0 million manats which is the smallest part of GDP compared to other industries

As a result of the reforms implemented by our state in recent years. the volume of arable land used for agriculture has increased. Table 8 shows the statistical indicators of land plots in hectares between 2005 and 2020. In 2005, the place of planting was 1797.6 ha, long-lived plantings were 221.5 ha, and in 2020 this amount was 2045.2 ha and 272.2 ha, respectively.

Table 8: Arable land, thousand hectares

	2005	2010	2015	2020	2020/2005, %	2020/2010, %	2020/2015, %
Place of planting	1797.6	1842.7	1897.5	2045.2	+13.8	+11.0	+7.8
Peaceful lands	45.6	41.4	40.2	39.2	-14.0	-5.3	-2.5
Long-lived plantings	221.5	227.4	237.0	272.7	+23.1	+19.9	+15.1
Hayfields and pastures	2693.9	2655.3	2595.1	2423.0	-10.1	-8.7	-6.6

Source: State Statistics Committee of the Republic of Azerbaijan.

<https://www.stat.gov.az/source/agriculture/az/1.3.xls> (13.04.2022)

A comparison of statistics between 2005 and 2020 shows that place of planting increased by 13.8% and long-lived plantings by 23.1%. In those years, we see a 14% and 10.1% decrease in peaceful landscapes and hayfields/pastures, respectively. Consequently, we conclude that peaceful lands and hayfields/pastures began to be used for planting.

In Table 9, we observe a change in the number of machines used in agriculture in the last five years. From 2016 to 2020, we see that the number of tractors has increased 2.05 times, the number of plows 4.52 times, the number of cultivators 16 times, the number of seed drills 11.14 times, the number of haymakers 10.08 times, and the number of grain harvesters 2.82 times. As a result of the state's investments in

agricultural technology and equipment in recent years. there has been a sharp increase in the number of agricultural machinery.

Table 9: The main types of agricultural machinery by the end of the year, thousand

	2016	2017	2018	2019	2020	2020/2016
Tractors	17.04	21.79	34.83	34.94	34.95	2.05
Plow	1.00	1.62	4.35	4.41	4.52	4.52
Cultivator	0.08	0.19	0.59	1.09	1.28	16
Seed drill	0.29	0.60	1.70	1.80	3.23	11.14
Haymaker	0.13	0.44	0.66	0.76	1.31	10.08
Grain harvesters	1.29	1.62	3.67	3.82	3.64	2.82
Cotton harvester	0.09	0.31	0.49	0.48	0.49	5.44
Machine for breaking solid mineral fertilizers	0.05	0.08	0.21	0.28	0.34	6.8
Spraying and dusting machine	0.13	0.19	0.85	0.96	1.30	10

Source: State Statistics Committee of the Republic of Azerbaijan
<https://www.stat.gov.az/source/agriculture/az/1.14.xls> (13.04.2022)

Table 10 and Table 11 show the agricultural production of the regions around Karabakh in the 1980s and 2020. If we compare the two tables, we can see that the region has great potential for the development of cotton and grape production. In the 1980s, cotton production was 20.8 tons and grape production was 248.1 tons; in 2020, cotton production decreased 2.34 times and grape production covered only 0.6% of the 1980 figure.

Table 10: Production of crop products in the 1980s, thousand tons

	Grain	Cotton	Tobacco	Potato	Vegetable	Melon plantation	Fruits and berries	Grapes
Aghdam	30.1	19.3	-	0.01	1.4	0.9	0.48	86.1
Jabrayil	20.1	-	-	0.01	0.5	0.3	0.03	42.0
Fizuli	31.9	1.5	-	-	0.6	0.5	0.05	100.8
Kalbajar	-	-	0.9	-	-	0.01	-	-
Gubadli	6.7	-	2.1	0.06	0.01	0.1	0.01	2.9
Lachin	3.0	-	0.1	0.05	0.4	0.02	0.02	-
Zangilan	4.6	-	1.3	0.06	0.1	0.05	0.04	16.3
Total production	96.4	20.8	4.4	0.37	3.01	1.88	0.63	248.1

Source: The State Statistics Committee; Fikrətzadə F., Hacıyeva S. 2020: s.33

Compared to the pre-war and current figures, we see an increase in the production of grain, potatoes, vegetables, melons, fruits, and berries. Grain production increased 1.93 times, potatoes 21.6 times, vegetables 30.6 times, melons 3.01 times, and fruits and berries 11.75 times. In 2020, the production of grain, cotton, and vegetables in Karabakh was 6.43%, 2.64%, and 5.3% of the country's total production, respectively. Jabrayil's current grain and grape production is much lower than it was in the 1980s, and will soon be restored to higher yields. Milk production in 2020 reached the same level as in the 1980s, but meat and egg production still lag behind pre-war levels. Both in the 1980s and in 2020, the production of the Aghdam region was higher than in other regions of Karabakh.

Table 11: Production of crop products in the 2020, thousand tons

	Grain	Cotton	Potato	Vegetable	Melon plantation	Fruits and berries	Grapes
Aghdam	57.5	7.1	5.5	86.8	2.2	4.7	0.4
Jabrayil	7.2	-	0.54	1.06	0.03	1.2	0.2
Fizuli	118.0	1.8	1.9	4.12	3.2	1.5	1.0
Kalbajar	0.3	-	-	-	0.08	-	-
Gubadli	0.04	-	-	-	0.05	-	-
Lachin	2.5	-	0.002	0.06	0.08	-	-
Zangilan	0.1	-	0.04	0.04	0.02	0.001	-
Total production	185.64	8.9	7.98	92.08	5.66	7.4	1.6
The ratio of total production in the country, %	6.43	2.64	0.77	5.3	1.26	0.65	0.77

Source: The State Statistics Committee, 2022, <https://www.stat.gov.az/source/agriculture/>

In Table 12, the highest meat production in 2020 was 2.8 tons in Aghdam and 3.3 tons in Kalbajar. The highest milk and egg production were observed in Aghdam and Fizuli. The total meat production in the regions mentioned in the table is 2.94% of the country's production, milk production is 5%, and egg production is 2.48%. Compared to the past, Jabrayil's meat production decreased by 1.84 times, milk production by

1.62 times, and egg production by 2 times. In the past, livestock was one of the main occupations of the population in Jabrayil. In the post-occupation period, with the establishment of "Smart Village" concepts in the region, great productivity in the field of animal husbandry will be achieved in a short time.

Table 12: Production of basic livestock products, thousand tons

	1980s			2020		
	Meat	Milk	Eggs (million units)	Meat	Milk	Eggs (million units)
Aghdam	3.8	24.4	19.2	2.8	38.8	17.4
Jabrayil	2.3	14.0	11.4	1.25	8.6	5.7
Fizuli	2.8	20.0	11.8	1.6	28.3	15.2
Kalbajar	2.0	16.3	8.1	3.3	17.4	5.0
Gubadli	1.3	12.1	4.4	0.09	0.78	0.5
Lachin	3.3	13.9	4.1	1.06	15.2	3.2
Zangilan	1.1	9.2	3.6	0.06	0.3	0.3
Total production	16.6	109.9	62.6	10.16	109.38	47.3

Source: The State Statistics Committee 2022 <https://www.stat.gov.az/source/agriculture/> ; Fikrətzadə F., Hacıyeva S. 2020: s.35

The large-scale measures taken following state programs have laid a solid foundation for the further development of the regions. President Ilham Aliyev has signed an order dated January 29, 2019, to adopt the "State Program of Socio-economic Development of the Regions of the Republic of Azerbaijan in 2019-2023." This decision was made to continue the work being done in the field of socio-economic development of the regions. including rural areas. in the coming years. based on the recent successful economic measures taken in our country. As a result. it is planned to improve infrastructure and social services further. increasing employment and the welfare of the population living in the regions (<http://www.e-qanun.az/framework/41320>).

The main results expected for economic development from the implementation of the State Program are as follows:

- High growth dynamics of production and processing of agricultural products will be achieved;
- The specialization of regions in production and processing will be deepened;
- The volume and range of non-oil exports will further increase;
- Farmers' partnerships and agricultural cooperation will develop;
- Productivity and added value will increase;
- Modern and large farms will be created by developing small farms.

The following results are expected for the development of livelihoods in the country with the implementation of the State Program:

- The quality of utilities and social infrastructure in the regions will further improve;
- The supply of high-speed fiber-optic broadband internet and modern communication services will increase in the regions;
- Employment opportunities will increase in the regions;
- The service sector will be further developed in the regions;
- The supply of energy resources to the regions will further increase;
- Sustainable and balanced socio-economic development of the regions will be achieved.

3.3. Assessing the prospects for the development of agriculture and livelihoods in modern conditions. Make suggestions for improving development strategies based on research findings

Our liberated territories cover large and fertile lands. Therefore, the prospects for the development of the agricultural sector are higher than in other areas of economic activity. The agricultural industry is also a traditional source of employment. However, the resettlement of the population and ensuring the

agricultural sector's development requires the solution to several challenges. Some of them are listed:

- 1) Preparing the land for cultivation;
- 2) Determining the form of arable land use;
- 3) Establishing a mechanism to provide necessary assistance to land users, and
- 4) Handing over land plots to the user.

With the direct support of our state, these issues can be addressed in a short time. Serious technical preparations are required to revitalize livelihoods and agriculture in Karabakh. Firstly, it is necessary to use Azerbaijan's 25-year land reform experience. Based on this experience, the level of productivity in the agricultural sector can be compared with other countries. The success of the stages mentioned above of agrarian development should be optimized based on two factors: minimization of costs and maximization of the number of highly qualified personnel to be attracted to the regions. The development of the agrarian sector depends on the nature of agrarian reforms, including the organizational and legal forms of agricultural entities. The population returns to virtually devastated lands with virtually no infrastructure. A part of the population, along with infrastructure, is ready to return at any time, provided they are given some funds to build houses and land to cultivate. However, it is generally accepted that the return process should begin after the main infrastructure has been established. Such infrastructure includes the construction of roads, electricity, gas and water lines, hospitals and schools and so on. A subsystem based on modern technologies must be established to allow people to return to Karabakh and build a new life (Gülaliyev M, Həsənzadə F. 2021).

In the scientific work of Muzaffarli N. and Ismayilov E., they analyzed Karabakh for the restoration of post-conflict areas. They noted in detail what measures should be taken as soon as the lands are liberated from occupation, and in what sequence the programs should be implemented (Muzaffarli N. and Ismayilov E.,

2010: s.89-179). The measures to be taken in the first place in each area for the restoration of life and reconstruction of infrastructure in our liberated regions are outlined below:

1. Repatriation. Many refugees and IDPs have established new living conditions and jobs, and it is not easy for them to leave their homes. The fact that this process is completely voluntary will complicate returning the population to their homeland. Incentives are important to attract people to return to the liberated lands. For example, land privatization, credit and tax incentives for entrepreneurs, and others can be included in these incentives.

2. Restoration of housing stock. Full provision of the local population with housing is one of the highest priorities of post-conflict rehabilitation. Restoration of the housing stock requires repair, construction, and reconstruction of both apartment and communal buildings, as well as villa-type individual houses. There are two types of tasks: a) Construction of temporary settlements, and b) Construction of permanent settlements.

3. Restoration of energy supply. It is one of the most urgent initial measures because it plays a vital role in the life and activity of the population and other restoration work. The revival of energy in the region is based on applying one of two models: complete restoration of the existing power supply system; and establishment of local electricity networks based on the settlement structure at each stage of the restoration process. Rehabilitation of previously existing electricity networks may be relevant, especially for Aghdam, Fizuli, and Jabrayil regions. A program adapted to the country's overall energy concept should be developed to provide energy in the region.

4. Rehabilitation of water supply and sewerage systems. Drinking water supply is one of the critical issues. It will also help meet the demand for water to irrigate backyards. Work on restoring the water supply system in the region, constructing new water mains, forming water distribution networks, and repairing old

canals with modern technology should be carried out in parallel. Rehabilitation of sewerage systems in settlements, especially in urban areas, is crucial. Since there has been no sewerage system in the region since Soviet times, it is necessary to build it from scratch with modern technology.

5. Gas supply. It is not one of the critical issues in the recovery process, as delays in gas supply are not a limiting factor for repatriation or economic recovery. No gas was supplied to the region during the Soviet era, so the construction of new gas pipelines was a top priority. A gas supply network will be built to provide gas to the population in post-conflict areas.

6. Rehabilitation of the working infrastructure of civil administration bodies. In each of our liberated districts, local executive authorities, urban and rural municipalities, the district court, the district department of the Ministry of National Security, the district prosecutor's office, and the district police department must be restored. Public life in the region should be fully revived compared to other regions of the country. Although infrastructure provision for civil administration is not a priority, it must be included in the state program.

7. Rehabilitation of transport infrastructure. The transport infrastructure in our liberated lands is destroyed in the last 30 years. It is necessary to consider its location on the Silk Road When planning the construction of new roads in the region. Because the role of this road for economic development and international relations is significant. Rehabilitation of the railway network will be carried out at a high technological level. Aghdam has a favorable geographical position for establishing a regional aviation hub.

8. Restoration of the telecommunication network. A unified information and communication system should be created for the returning local population, which will be integrated throughout the country. The telecommunications network must fully meet the region's needs, and livelihoods in the region must be able to operate independently. The information and communication system should be built

on five main components: 1. Urban and rural telephone networks; 2. Mobile phone communication; 3. Retransmission of radio and television programs; 4. Local radio and television broadcasts; and 5. Postal and telegraph services.

9. Restoration of social facilities. Most of the social facilities in the region need to be rebuilt. These include health and education facilities, community centers, sports palaces, clubhouses, and libraries. The need for health services in the region should be identified by examining the health status of IDPs. The district's health workers will be selected mainly from the IDPs returning to the districts. Courses and programs will be organized to train employees as highly qualified specialists.

Most schools in the occupied territories have to be rebuilt as they have been destroyed. It is planned to build new training centers on the site of old educational institutions. The material and technical base of the education system will be restored to the highest world standards.

Restoration of cultural and sports facilities is one of the essential tasks in the region. Most of the houses of culture, village clubs, libraries, and museums are planned to be restored in the future. Restoration of architectural and material-cultural monuments will be carried out based on special programs under the leadership of relevant government agencies.

The construction of vocational training centers is important to prepare the local population for a new socio-psychological life, improve their skills and acquire new skills. Establishing a vocational training center will help develop local entrepreneurship, train personnel for the professions in demand in the region, and reduce unemployment. However, the lack of special training facilities and the lack of qualified staff to organize the training are significant problems. It is possible to involve experts from abroad to solve this problem.

Taking into account the above-mentioned measures when rehabilitating infrastructure and livelihoods in Karabakh will help to speed up the reconstruction process.

State intervention in the management of economic processes is important to ensure socio-economic development in the Karabakh region. Serious market relations and numerous competitive small and medium-sized enterprises will be established in our liberated lands. From this point of view, new forms of economy range from the selection of market-competitive products to the adoption of high international technologies, accounting, budgeting, taxation, insurance, banking systems, marketing services, etc. should study and apply numerous works (İbrahimov İ. 2021: s.55). Table 13 shows the use of available resources in the liberated lands.

Table 13: Directions for the use of available resources in the liberated territories

Rational use of land resources:	In the field of crop production:
Quantitative and qualitative indicators should be clarified Rehabilitation of polluted and degraded lands Elimination of causes of erosion and salinization Assessment of erosion and environmental factors The use of lands for non-rural purposes should be restricted	Complete cleaning from explosives Restoration of fertility Involvement of mountain and foothill lands in cultivation Ensuring investment in the product Introduction of crop rotation system Equipping with modern equipment and facilities Provision of highly qualified personnel,
In the field of animal husbandry:	In the field of melioration and water management:
Organization of modern stables Establishment of a poultry farm Taking into account the composition of the breed Product processing should be set up at the level of modern requirements Ensuring veterinary control Creating a high quality feed base	Identification of lands in need of melioration Organization of reservoirs Prevention of water losses Provision of areas with irrigation water and people with drinking water Modern technology should be applied to irrigation Allocation of the required amount of investment

Source: İbrahimov İ. 2021, s.55

However, in our liberated territories, land reforms and privatization are required. Because it is impossible to attract investment to the region without privatization.

Although the reformation of the agricultural sector in our liberated lands is costly, it has significant advantages (Gülaliyev M., Həsənzadə F. 2021). For example:

1. The irrigation system can be reconstructed, and the advantages of modern technology can be used to make the region suitable for agriculture;

2. In the initial period, arable lands may be used collectively. For example, rehabilitating land given to individual villagers may be more costly. Instead, the chances of making the land of any village or settlement as a whole generally usable are higher;

3. The shortage of human resources in the agricultural sector will be acute at first. Therefore, the efficient use of capital and labor is essential. In these regions, young people working in the farming industry may be given discounts on admission to universities or military service and other benefits;

4. In the region, the ability of individual households to use credit to expand production in the agricultural sector will be weak. Therefore, ensuring access to credit for the development of the farming industry should be the focus of the state;

5. There will be a great need for technical equipment for individual households to work productively on their land. The state should pay special attention to providing the agricultural sector with the necessary equipment in these regions;

6. Local villagers' marketing or storage of products on the market is not an expense at the level of the financial capacity of an average household. The state should apply public procurement in this area;

7. One of the main problems in the settlement of the population in the liberated territories and the development of the agricultural sector is related to the efficient deployment of labor. In the short term, government intervention will be necessary to ensure the division of work in the region.

Considering the problems and advantages mentioned above, in the short term, land reform in the Karabakh region and its transfer to individual peasants can create serious difficulties for agricultural development. Therefore, it is expedient to

privatize the land plots as the property of OJSC. In this case, the state must provide shares to each household according to the land plot to be given as “share land.”

In Table 14, SWOT analysis was used to evaluate the region`s strengths and weaknesses and the current possibilities and threats for economic restoration in Karabakh. For the area to flourish in the near term, it must maximize profits from existing resources. It is necessary to strengthen the opportunities for local entrepreneurs, farmers, and home producers to receive quality products. One of the most important steps is to develop the weaknesses as soon as possible and minimize the existing risks by using the identified opportunities.

Table 14: SWOT analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • A good place for living and settlement; • Rich in natural resources; • Favorable economic position; • Mild climatic conditions; • Agriculture has historically been a major occupation; • Organic agriculture production. 	<ul style="list-style-type: none"> • The lands remained unused during the occupation; • There is no established mechanism to assist villagers in land use; • Lack of identified ownership required for agriculture; • Non-available public services; • Lack of technology and infrastructure; • Lack of jobs; • Weak economic ties; • Lack of regulated market; • Weak farming partnerships and agro-industrial integration; • Lack of access of the local population to financial resources and underdevelopment of the agrarian insurance system.
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Making lands suitable for agriculture; • Availability of state support for the restoration of living; • Opportunity to build modern technology and infrastructure; • Possibility of agricultural development; • Focus on local and foreign investors; • Possibility to implement the Smart Village concept in the area; • Implementing incentives to attract young 	<ul style="list-style-type: none"> • Being a neighbor of Armenia; • Incomplete cleaning of mines and explosives; • There is a risk that agrarian reforms will not be effective; • The desire of the population to return to the region is weak; • There may be a shortage of workforce in the sectors.

<p>people to employment in the region;</p> <ul style="list-style-type: none"> • The development of arable land by the state can reduce the costs of individual land users; • Ensuring access to credit by the state to the villagers; • Public procurement can be applied for the storage and sale of products; • Ensuring the proper division of labor and job opportunities for the population. 	
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Source: created by the author

Restoration of agriculture and livelihood in our liberated lands can be implemented according to several methodological principles. In their research, Nazim Muzaffarli and Eldar Ismayilov gave detailed information about these principles (Müzəffərli N., İsmayılov E.,2010: s.33-47). The principles include the following:

1. Considering international experience: Experiences of different countries in the rehabilitation of the economy destroyed by military conflicts and natural disasters should be used to prepare rehabilitation programs for our liberated lands.

2. Minimizing costs: It is important to keep costs as low as possible and use resources as efficiently to carry out the restoration process. There are sufficient financial resources in our country, and we can plan the restoration process with high quality due to these opportunities.

3. The combination of the two approaches - the restoration of the old one and creation of the new one: There are remains of some buildings and infrastructure in our liberated lands. These remains should be recovered as much as possible while reconstruction works are implemented. If some of the infrastructures have become useless or old over time, we can restore them to new modern conditions.

4. Flexibility in urban planning: Former residential buildings should be restored for the local population who are returned to the region. Additional urban planning and landscaping should be planned using new progressive approaches.

5. New settlement structure: The new settlement structure in the liberated lands should be determined not only for the initial rehabilitation program but also for

a longer period, considering future demographic growth. The real need for residential buildings, production, social and health facilities, utilities, and life support infrastructure should be estimated and considered.

6. Step by step application: The initial priorities for the restoration of life in our liberated lands should be identified and implemented step by step:

- A State Program that includes rehabilitation measures should be developed;
- The final adjustment to the State Program should be made after a visual inspection of the area;
- Livelihoods must be restored;
- An independent, self-sufficient region must be established in the future;
- The functioning of social-public facilities must be restored to fully form people's lives.

7. Cooperation between independent and government experts: Specialists who develop state programs should benefit from the knowledge of civil servants. Because civil servants have accurate information about the region. Also, joint analysis of problems by local and foreign experts will help find a solution as soon as possible.

8. Cooperation with foreign experts: The utilization of theoretical and practical knowledge of highly qualified foreign experts, is an important factor for the success of the rehabilitation program.

CONCLUSIONS AND RECOMMENDATIONS

The government of the SSR has exploited the wealth of Azerbaijan for years. Finally, after our country gained independence, the country's economy began to develop rapidly in a short time based on successful policies and laws adopted by Heydar Aliyev and Ilham Aliyev. Agriculture in our country is less developed than in other areas and accounts for only 6.74% of GDP. The main problems in the field of agriculture and livelihoods are:

- Weak economic efficiency of production;
- The existence of gaps in the applied state programs;
- Low production of agricultural products;
- Not fully equipped with modern technologies;
- Incomplete formation of the centralized information system;
- More imported products than exports;
- Weak access to the international market;
- The high unemployment rate;
- Lack of qualified personnel in rural areas.

The following measures have been proposed to address these challenges in agriculture and livelihoods:

- Natural resources must be used efficiently;
- Modern technological equipment must be used;
- Agriculture should be developed intensively;
- Strengthening the activities of economic entities in regions;
- A single centralized agricultural information system should be established;
- The process of providing the population with food and exporting products to foreign markets must be fully organized;
- The population in the regions should be provided with jobs;

- The social welfare of the people in the villages must be improved;
- Sustainable development of the regions must be organized.

A transformation policy must be created to solve the main problems in the development process of agriculture and livelihoods. The main goal of the transformation policy is to bring Azerbaijan to an important place in the international arena to develop agriculture. As a result of the complete formation of the transformation of agriculture, intensive development of the following areas will be ensured:

- Raising the level of employment;
- Poverty reduction in the country;
- Improving the food supply and nutrition of the population;
- Ensuring food security;
- Creating conditions for the export of products to international markets and increasing food exports;
- Faster and better development of the agricultural system with the application of new technologies and islands;
- Improving the knowledge and skills of farmers.

Infrastructure, buildings, livelihoods, agriculture, health care facilities, education system, energy supply, and communications have been destroyed in our liberated lands. In order to rebuild life and economy in Karabakh, the activities of each of them must be systematically and gradually restored. There is a need to implement specific support mechanisms for the implementation of rehabilitation measures in the area and the organization of production. First of all, the current situation in the area should be analyzed, and on-site inspections should be carried out. Specialists should be involved in the region to collect the data, and a plan should be developed after a detailed analysis. Policies and programs should be created according to the plan with the support of the state. In order to restore high-quality interconnected economic

sectors in a short period, it is necessary to study the experience of foreign countries in the post-war and post-disaster periods. Under these countries' policies, measures, and state programs, a program must be established for our liberated lands. Separate state programs and reconstruction measures must be developed for each region because each region's climate, relief, and economic parameters are different and unique. The policy applied for one region may have a different result in another.

In our liberated territories, the lands suitable for agriculture have been unused for 30 years and, the lands have been rendered useless, the existing agricultural enterprises and equipment have been destroyed. Need to establish appropriate mechanisms for the restoration of agriculture. The following proposals should be taken into account in the reconstruction work:

- Complete demining of these lands is the most critical priority. Because a completely risk-free life must be provided for the local population returning to the area;
- Construction of roads, buildings, infrastructure facilities;
- The process of returning the local population to their native lands should be organized;
- New job opportunities should be created for the returning population;
- Providing soft loans to returnees and exempting them from some taxes will encourage them to return to the area;
- Initially, salaries for the population working in the region should be as high as possible;
- The construction of new universities in these regions will help in the process of attracting young people. In addition, certain concessions should be made in the military and classes for students working in agriculture.

The reintegration of the liberated territories into the country's overall economy will increase the impetus for Azerbaijan's economic development significantly. Under

the initiative and leadership of our President, a long-term strategic plan covering the restoration and development of all spheres of life, economy, and services at the state level is being prepared in several variants. Two critical aspects should be taken into account in solving this problem. First of all, since implementing rehabilitation and development projects is a complex process, there may be different positions, options, and approaches to its solution. Second, this plan needs to be supplemented and improved.

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