

REPUBLIC OF AZERBAIJAN

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**IMPROVEMENT OF THE MECHANISM OF
INNOVATIVE DEVELOPMENT MANAGEMENT OF
AGRICULTURE**

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EXTENDED ABSTRACT

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GENERAL CHARACTERISTICS OF THE WORK

Relevance and development level of the topic.

In the context of the intensive process of globalization in the world expansion of innovation activity in all sectors of the economy on a qualitatively new level, rapid spread of innovations, their application in production areas become to be more dynamic in an unprecedented way. Under such conditions the most important issue afflicting Azerbaijan is to prevent backwardness in comparison with the global development speed. And this first of all is possible by the reduce of the dependence of economy on oil and gas, achievement of the rapid development of the non-oil sector and the agricultural sector, which is an integral part of it, increase of the competitiveness of the economy as a whole, and by ensuring its innovation-based progress.

As a result of large-scale reforms implemented in Azerbaijan over the past 10 years favorable conditions was created for the dynamic development of agriculture. It was the strengthening of state support for agricultural development and determining of the strategic goals and institutional changes in this field to lay foundation for transition of this field to a qualitatively new stage. In order to ensure the food safety for the population of the country and to increase the export potential of agrarian processing enterprises, large farms are created, special attention is paid to the organization and development of agroparks and other innovation infrastructure. The Patriotic War ended in the 44-day victory in 2020 and complete defeat of the Armenian fascists made possible to carry out large-scale construction work and take serious actions on the territories liberated from occupant (TLFO).

Within the last few years approved by the relevant decrees and orders of the President of the country there were developed State Programs on long term development of cotton, silk, tea farming, and the other agriculture fields, Strategic Road Map on production and processing of agricultural products in Azerbaijan, National Strategy and Government Programs, Industrial and Service Districts on social economic development of the regions important for the agriculture, education and information society, and the measures considered in these important state documents are implemented successfully. As the

result of all these in 2005-2019 the volume of gross agricultural output increased by 4.2 times, crop production – by 3.8 times, livestock – by 4.8 times.

The level of self-sufficiency of the population of the republic with many food products has been basically improved for several years. However the level of self-sufficiency of the population in butter, vegetable oils and margarine, grain, milk and dairy products varies between 65-86%. Despite of a significant part of the employed population in the country is busy in agriculture, the share of manufactured products in GDP is low. Expansion of innovation activity in all sub-areas is set as an urgent task for increasing the level of self-sufficiency of the population in the country in agricultural products through domestic production, bringing all types of products in line with international standards, and for substantial increase in exports of agricultural products on this basis, bringing imports to the threshold, providing youth employment in the agricultural sector, improving the material welfare of employees working in this sector as a whole, and for solving the other social economic problems, for modernization of the agriculture sector in the country in terms of new economic thinking, and for strengthening its position in the economics of the country.

The topical economic issues of the agricultural sector in Azerbaijan, its role in ensuring food safety and the formation of entrepreneurship, systemic transformations and modernization in the agrarian economy, state regulation of material and technical support to production in this sector, creation of modern forms (network) of innovation infrastructure there, such issues as employment, and investment attractiveness of the industry are researched in the scientific works of such Azerbaijan scientists as Samedzadeh Z.A., Ibrahimov E.R., Guliyev E.A., Atashov B.Kh., Aliyev I.H., Ibrahimov I.H., Aliyev T.N., Balayev R.A., Guliyeva A.E., Verdiyev A.Ch., Salahov S.V., Huseynov M.J., Abbasov A.F., Abbasov V.H., Veliyev A.H., Khalilov H.A., Gasimli V.A., Gasimov F.H., Najafov Z.M., and foreign researches as Sandu I.S., Sergeyev V.M., Tatyanyenko T.S., Usacheva I.G., Remezko A.A., Kameneva K.P., Morozov Y.P.,

Polunin G.A., Lenchuk E.B. and others, and the important advice were given.

Without reducing the scientific and practical significance of the conducted researches, it should be noted that the directions on improvement of the existing management mechanism of the innovative development in agricultural sector in accordance with international practice has not yet been comprehensively researched. Therefore, the main focus should be directed to improve the existing structure of arable lands there, to intensify production, production of import-substituting processed products, organization of close relations between science and industry, to improve the infrastructure for the sale of agricultural products, to fundamentally modernize agro-processing enterprises, to form the agribusiness support infrastructure and to implementation of other innovative projects. All these brought to the fore the necessity of development of the scientifically substantiated theoretical-methodological and practical proposals and advice on the formation, development and use of innovation potential of the agricultural sector, and conditioned the timeliness of the chosen topic.

The object of the research is a set of institutions and organizations, as well as service and management bodies, acting in the agricultural sector which is one of the leading sectors of the economics in the republic.

The subject of the research is development and mastering of innovative technologies in the agricultural sector, as well as organizational and economic relations, new scientific approaches and regularities on management of innovative development of this sector.

The goals and tasks of the reserach. The goal of the research is to develop the scientifically substantiated proposals and advice on increase of the efficient management of the innovative processes in agricultural sector.

In accordance with the goals of the disseration work the following research tasks were identified and implemented:

- adaptation of the key features of innovative development and the characteristics of its formation to modern conditions in the agricultural sector;

- Determination of theoretical and methodological bases of the innovative development management based on the comparative analysis;
- research of theoretical aspects of the impact of sustainable economic growth of the innovative development, and formation of improved methodological approach;
- development of the financing mechanisms of the innovation process management in agricultural sector in accordance with the global experience;
- identification of reserve opportunities and identifying ways of their efficient use on the basis of analysis of the current economic situation in the agricultural sector and assessment of the provision of agricultural enterprises by highly qualified personnel;
- Determination of the ways of the innovative development management in agriculture and of the assessment and efficient use of the current potential especially on the territories liberated from occupation (TLFO);
- development of innovation and investment strategy of the agricultural sector and development of appropriate taxation, insurance and credit policy measures on its basis;
- giving recommendations on expanding infrastructure in the application of innovation projects in agriculture;
- improvement of the management mechanism of the agricultural sector based on the efficient use of labor resources and on the application of indicative plans in the development of innovative technologies.

Research methods. Structural-functional, mathematical-statistical evaluation, systematic approach, graphical, experimental, computational-constructive, expert assessment, analytical generalization methods, as well as modern methods and tools of economic analysis were used during the research. In the research while developing the theoretical and methodological approaches, the works of local and foreign scholars on improving the management mechanism of innovative development of the agricultural sector, as well as laws, materials, normative-legal documents, and materials on

development of the agricultural sector in Azerbaijan of relevant research institutes were also used as main guide.

The main provisions to be defended:

1. The theoretical and methodological aspects of the innovative development management in the agricultural sector were researched on the basis of research and systematization of existing works on researched issues by Classics of economics, economists of foreign countries and Azerbaijan. On the basis of this researches the main directions of strategies for implementation of innovation measures in agriculture were clarified;

2. Development of production on the basis of innovations in the agricultural sector and a logical-structural model of management was proposed;

3. The approaches of foreign researchers, relevant experiences of countries were systematized on organization of mechanisms of the innovative development management, the models of innovation process management, financing of innovative development in accordance with the characteristics of the agricultural sector, and the expediency of their use in Azerbaijan as well as their directions were identified;

4. The current state of innovative development of the agricultural sector was analyzed and evaluated with a systematic approach and various research methods, backup capabilities was identified. The directions for joining Azerbaijan the countries with a high level of innovative development by their rational use were defined, and the grounds for innovative development was identified on TLFO;

5. The dependence of the total agricultural production area on the key economic indicators (investments in fixed assets, commissioning of fixed assets, exports) was assessed with the help of mathematical and statistical methods using ready-made mathematical software packages, and relevant models developed, the forecast of agricultural production by 2025 was given;

6. Special attention was paid to the issues of transition of the agricultural sector to the innovative development path due to intensive factors, provision of food safety in the country, increasing the efficiency and competitiveness of the agricultural sector in the

domestic and foreign markets, motivation of peasants' work. As the result of this, the concept of mechanism of development and implementation of special action plan, improving the taxation and insurance system, management of innovative development of the sector on the basis of the management of innovative development of the sector was developed with the aim of attracting additional investments into the sector in order to ensure the integration of Azerbaijan to the global economic system rapidly;

7. Referring to the methodological approaches used in international practice, there was justified the expediency of creation of the agrarian processing industrial districts in the large settlements of administrative districts of Azerbaijan and agro-parks in the rural settlements, the long term forecast of their options was given, the impact on the regional gross product, the volume of production in the sector and the creation of new jobs was identified;

8. Methodical and practical recommendations were developed in the direction of improvement of qualified personnel training in the context of providing of the dynamics of innovation processes in agriculture, adaptation of the existing management system of the agricultural sector to the new economic challenges based on the application of indicative plans, modernization of innovative management system for effective use of the existing innovation potential of the industry;

The scientific innovation of the research consists of the following:

- the main provisions of the strategy of implementation of innovation measures in the agricultural sector was developed;
- There was developed a logical structural model of development and management on the basis of production innovations taking into account many factors on types of activities in the agricultural sector;
- Competitiveness indicators are classified by content into 5 objects (commodity, industry, production, agricultural market and country);
- 8 levels of criteria and tool provisions of the market-oriented reform strategy of agriculture were developed, creation of innovation and modernization funds was proposed;

- the number of agro-parks that can be created in rural settlements of the republic on options for the long period (for 2025 and after) was forecasted, and their effect to the volume of their production and creation of new work places was estimated;

- the expediency of specialization in existing settlements of administrative districts of the country, creation of agro-processing industrial districts in accordance with the specifics of the field and the region was substantiated;

- the impact of the key economic indicators of agriculture (investments in fixed assets, commissioning of fixed assets, export of products) on the volume of gross output of the industry was assessed due to the mathematical-statistical method and appropriate model was developed;

- A special action plan reflecting two directions (1. Formation of a "portfolio" of investment sites for agricultural production; 2. Development of private and public partnership in agriculture) was developed to attract additional investment in the agricultural sector.

Theoretical and practical importance of the research.

The theoretical significance of the dissertation is that its scientific provisions develop the imagination about increase of the efficiency of management of the innovation-technological processes in agricultural production by using the potential of separate branch enterprises of agricultural enterprises. And this can serve for the purpose of future improvement of the search and mobilization mechanism of the innovative resources in agriculture. The practical significance of the dissertation is that its scientific provisions, results obtained, formed suggestions and recommendations can be used in innovation infrastructure expansion in the agriculture sector of the republic, application of advanced technologies in various sub-sectors of agriculture, expansion of agricultural production, technological innovation activity, assessment of the innovative activity of the agricultural production enterprises, sector research institutes, development of the different business plans and targeted projects on assumption of the field and regional innovation programs, regional social economic development plans, new varieties of plants and animal breeds, preparation of investment promotion documents on

agro-parks, clusters, agribusiness incubators, startups, value chain of supply points, development of a support mechanism for the development of public-private partnership, formation of development scheme on value chain of complex projects, creation of agricultural production Industry and Service Districts in the regions, teaching the 'Innovation Management in Agricultural Production' course in universities.

Approbation and application of research results. 35 articles and theses on the topic of the dissertation written by the applicant (including 12 articles and theses abroad) were published in authoritative local and foreign journals recommended by the Higher Attestation Commission. The main provisions of the dissertation were published in the materials of the 7th International Scientific Practical Conference 'Significance of the cooperation relations in the sustainable development of the agriculture market' conducted in Patigorsk (Russian Federation) in 2010, at the International Scientific Practical Conference 'Development of the regional economic policy and cooperation relations' – the 'Some theoretical aspects of the agricultural innovations' thesis (2014), at the International Scientific Practical Conference 'Innovative social and economic development of the regions: realities and perspectives' dedicated to the 92nd anniversary of the national leader Haydar Aliyev – the 'Innovation development in agricultural production complex' thesis (2015), at the International Scientific Practical Conference 'Economic growth and social welfare' dedicated to the 60th anniversary of the Institute of ANAS – the 'Some features of the modern development of the agricultural innovations' thesis (2018), at the International Scientific Practical Conference 'Strategic Road Map on perspective development of the national economics: priority directions of human capital formation' – the conference materials 'Innovative development as the basis of sustainable economic growth in agriculture' (2018), at the 7th International Scientific Practical Conference conducted in Makhachkala (Russian Federation) on November 22, 2019 – the conference material 'Improvement of the training of highly qualified personnel in the agricultural sector', at the 35th International Scientific Practical Conference conducted in Moscow (Russian

Federation) – conference materials ‘State support to agriculture development in modern conditions of economic development of Azerbaijan’ (2020), at the 25th International Scientific Practical Conference conducted in Yekaterinburg (Russian Federation) on February 10, 2021 - conference materials ‘Clusters as the basis of innovation development of the agriculture sector in Azerbaijan’.

Besides, the applicant published the following articles: ‘Main proposals of the concept of management of the innovation development in agriculture’ (2013), ‘Modern tendencies of the innovation process in AIC of Azerbaijan’ published in Kiev, the Ukraine (2014), ‘The role of the innovative development in agriculture in provision of food safety’ published in the ‘economics and ownership’ journal in Moscow, Russian Federation (2014), ‘The directions of the global experience application to the management of the innovation process’ (2015), ‘Agriculture in Azerbaijan and the directions of its innovation development’ published in Poltava, the Ukraine (2016), ‘The ways to increase the human resource potential in agriculture’ (2017), ‘Mechanisms of innovation processes management in agriculture and the modern experience’ (2018), ‘Economical – through the use of mathematical methods in the production of macro parameters to assess the impact on agriculture’ (SCOPUS 2020).

The results obtained in the dissertation, practical suggestions and recommendations were presented in the form of an editorial report to the Ismayilli State Agricultural Development Center of the Ministry of Agriculture in the Republic of Azerbaijan, and the relevant certificate on its use was obtained (Certificate No. 08-A, 23.09.2021).

Organization where the dissertation work was carried out at.

The dissertation work was carried out in the Institute of Economics of ANAS.

The total volume of the dissertation in symbols as well as the volume of its parts. The total volume of the dissertation is 457968 symbols, as well as introduction - 18640 symbols, Chapter I - 80587 symbols, Chapter II - 74399 symbols, Chapter III - 91331 symbols, Chapter IV – 72987 symbols, Chapter V - 68954 symbols, Conclusion - 19125 symbols, references - 27876 symbols. The volume of

dissertation without the tables, diagrams, pictures and references is 429309 symbols.

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MAIN PROVISIONS PROVIDED FOR DEFENSE

1. The theoretical and methodological aspects of the innovation development management in agriculture were researched on the basis of research and systematization of the existing works on researched problems by the classics of the economic science, foreign and Azerbaijan economist scientists. The key directions of the strategy to implement the innovation measures in agriculture were specified on the basis of these researches.

The concept of "innovation" was put into science as a new economic category in the first decades of the 20th century by Austrian scientist Joseph Schumpeter. For the first time in 1911 J. Schumpeter reviewed the issues (innovation issues) of new combinations of the factors affecting development in his work named 'Theory of the economic growth' and gave full description of the innovation process. Thereafter researchers gave many definitions of the 'innovation' concept. However, none of these definitions does not provide a universal explanation of innovation theoretically and practically.

According to Drucker P. 'Innovation is a specific tool and action that allows to strengthen resources and create wealth with new knowledge'¹ In other words innovation is a concept of strengthening resources with the ability to create new value.

According to the famous Estonian economist Lapin V.H. 'Innovation is a complex process oriented to development, expansion and use of new experimental tools to better meet people's needs'². As it can be seen, in these approaches the innovation is not considered as a specific object, the organizational management, social and the other innovations are included in this process.

From this point of view different groups consider the innovation process as a system of performed sequential, multifaceted and multi-stage elements.

Effective regulation and management of this system is very important for the innovation process to be effective.

Azerbaijan scientists prof. Najafov Z.M. and prof. Gasimov F.H. mention in their approaches that, 'innovation is a process covering the whole period of transformation of scientific knowledge, scientific ideas, discoveries and inventions into innovations'³. According to the Azerbaijani expert Taghiyev A.H. famous for their innovation researches 'innovation process is a set of interrelated processes carried out at different stages from creation of a new idea up to its appropriation and marketing of the purchased product'⁴.

Summarizing the mentioned ideas about the innovation process it can be concluded that in their approaches the priority is given to the organizational aspects.

But the organization and management process of the innovation, ensuring of its dynamics and effectiveness demands the complex review of the other economic, social, juridical, international and

¹ Drucker Peter F. Innovation and Entrepreneurship, Harper Collins, -2006. -288 p.

² Lapin N.I. The problems of formation of the concept and human dimensions of the strategy of the phased modernization of Russia and its regions p.8-19 // Social researches. 2014. No. 7

³ Najafov Z.M., Gasimov F.H. Innovations: creation, expansion, and development perspectives. Baku: Elm, 2009. - 416 p., p.225

⁴ Taghiyev A.H. Innovation, brochure. Baku, 'Teknur', 2011, - 45 p.

organizational activities.

In accordance with this, the famous economist prof. Aliyev's T.N. approach draw attentions. According to Aliyev T. Effective management of the innovation process covers a wider range of aspects. These aspects include normative-legal base; organizational; economic and social; scientific technical and technological; information and communication; international aspects and so on. Each mentioned aspect therefore covers a large number of subsystems (aspects)⁵.

In general, innovation process consists of acquisition and commercialization of inventions, new technologies, types of products and services, production decisions, financial, administrative activity, and the other intellectual activity. New empirical data based on the study of real ideas shows that study of market needs in the innovation process is of great importance. As the experience shows, only % 25-30 of all ideas underly the basis of the innovation can be realized.

Summarizing all mentioned above, we can say that, innovation process is a set of activities (stages) that are directly involved in the transformation of a new idea, new knowledge, new product and service. The innovation is a phased process, and this plays an important role in the emergence of new technologies and new products. In other words the innovation process is a chain of 'science - technology - production – consumption' processes.

Innovations in agriculture can be classified by types as below: selective genetic; productive-technological; organization management; social economic. The classification and scope of these types are reflected in the table compiled by us. In our opinion, giving preference to production technological and organizational management types in the context of the current state of innovative development of agriculture forming the raw material base of the agrarian sector as a result will allow the application of the other types of innovations.

As the result of the research, there was determined the level of impact of the factors hindering the process of increasing innovative technological activity in the agricultural sector. Among those factors

⁵ Aliyev T.N., Babayev L.B. Organization and management of the regional innovation system. -Baku, 'Elm ve tehsil", 2013, -272 p.

'Weak development of the agricultural technology market', 'Lack of need for innovations implementation in production technology', 'Weak development of innovation infrastructure', and 'shortage of professional staff' have the greatest rank.

One of the main priorities of scientific, technical and innovation policy in the agricultural sector is the support of fundamental and applied sciences by the state. At the same time, interaction between academics, universities and field sciences should be established. The most effective way to succeed in this area is expansion of the network of innovation infrastructure in the agricultural sector.

The researches show that, there is no universal strategy and model of implementation of the innovation into agriculture. It is from this point of view it is worth to mentioned that, the content of the strategical management of the innovatinn processes are unique, implementation methods cannot be applied to the production of other innovative products.

We consider that, selection of management strategy of the appropriate innovation process, as well as market position of the innovation implementation, dynamics of changes taking place here, technical potential in the production of goods and services, economic situation and cultural environmental factors must be taken into account. Innovation measures requires certain work justified logically step-by-step to be done to achieve the set strategic goals. In this case, the influence of external factors in contact with the environment must be taken into account, and it is important to execute the developed scenarios while realizaion of innovation measures in the following sequence: - philosophy of enterprises; - entrepreneurial policy; - goal of sustainable development; - strategy of the enterprise; operative duties.

2. A logical structural model of development and management of production in the agricultural sector on the basis of innovations was proposed.

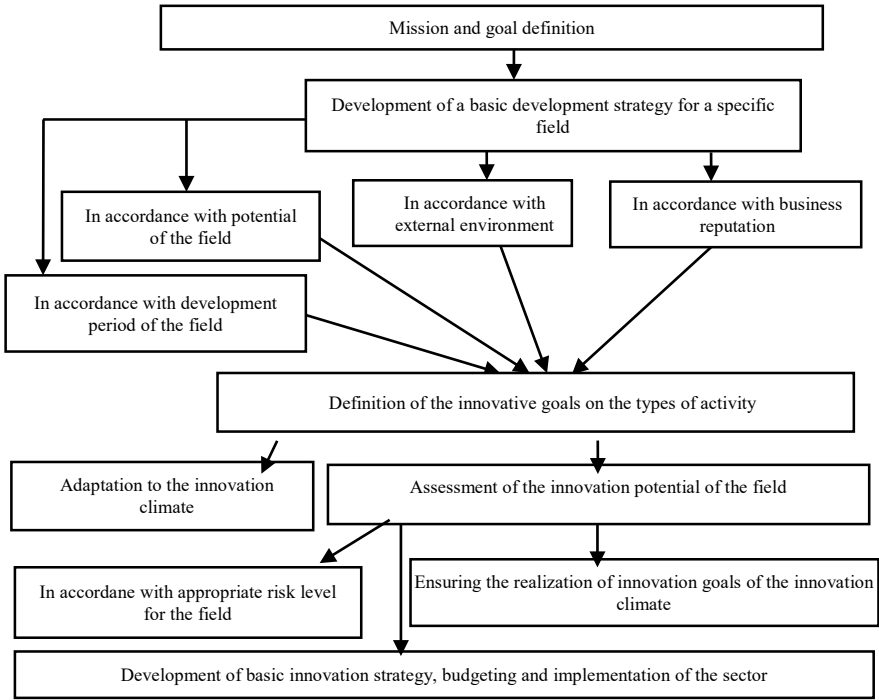
Innovation processes on agricultural production networks should be implemented in accordance with the innovation strategy and the course of development of all production areas. Objectives of innovation activity are formed in accordance with the goals of the organizations and the chosen strategy as a whole. Here the earning of

additional income attracts attention as one of the key aims. At the next stage of innovation activity there must be established a body to control the innovation processes (establishment of cooperation with foreign organizations, creation of a special department, temporary labour collective) meeting the criteria and requirements of all innovation goals. A specialized unit on innovations within the enterprise should be created as a first step in formation of a special innovation department in enterprises. Taking into account the mentioned above, the logical structural model of the development of innovation activity in agriculture can be expressed like in Scheme 1.

For the effective implementation of this model the relevant innovation projects should be developed in accordance with the basic ideas in the next stages, and based on this there should be implemented the complex of interacting measures directed to development and spread of the new production type and technologies. Realization of large scientific and technical projects on basic ideas, formation of new generation technologies, creation of technologies that have no analogues in the world and country practice is understood. Small and medium-sized inventions in improving innovations are realized, the technology of existing commodity processing is improved, technical qualities are increased.

When it comes to innovation projects the innovative ideas, relevant stages of their emergence and development are understood. In the next stage, all innovation ideas are concentrated in one innovation program, and this acts as a basis for development of innovation strategy and innovation budget of enterprises. At this stage the efficiency of the innovation program has to be assessed. The assessment criteria of the innovation project include: aims, strategy, policy, enterprise values, marketing, scientific research and experience constructor works, finance and production. The success of realization of the innovation policy depends on the ratio of production technology and expences, sale volume, and prices for new commodity and services. While estimating the efficiency of the innovation program of enterprises a transition to development of the innovation strategy takes place. Taking into account the micro- and macro environment impact of the innovation strategy its types were differed and their value was revealed. In the framework of

realization of the innovative development strategy it is demanded to pay great attention to preparaton of the innovtion budget. It is the budget the innovative activity of the enterprise is coordinated with other activities with. The use of material, financial and labour resources for implementation of the planned innovation strategy is interconnected. We consider that it is the innovation budget to allow to reach the following goals:



Scheme 1. Logical structural model of the development of innovation activity in agriculture.

- carrying out clear division of responsibilities among employees in the process of implementing the innovation strategy;
- too foresee the results of each employee's work;
- regulation of information flow and establishment of effective interaction between all structural units;
- implementation of the motivation system by determining the appropriate ammount of rewards for employees' labor sacrifices.

In the framework of general budget processing for the enterprise activity after the innovation strategy and budget are formed it is necessary to start the implementation of innovation strategy. The changes into the innovation strategy can be done if the mission, basic development aims and potential level of the innovation in an enterprise is changed.

2. The approaches of the foreign scientists and the relevant experience of the countries on organization of mechanisms of innovative development management, models of innovation process management, funding in accordance with the features of innovative development in agriculture were systematized and the expediency of their use under conditions existing in Azerbaijan is justified, and the directions were determined.

The problem of managing the innovation process was researched in 50s of the last century by the leading economists of the world, the existence of a trajectory of its development along a straight line was proved, its 'fundamental research → experimental constructive projects → production → marketing → sales' first-generation model was proposed. But after 20 years such researches as Roswell R., Freeman K., Horsley R. A., Rozenberg N. highlighted the necessity of implementation of the models of non-linear innovation process, mentioning the importance of paying attention to marketing, market and technical factors for successful innovations, developed five models of new generation innovation process. Among them the strategic network model by Roswell R. was distinguished by the following features: dominance of the integrated system in the process of innovation development; existence of an improved organizational structure to take efficient and quick decisions; the efficiency of the external communication channel at the expense of joint conduct of automated projection and development of internal database. Later, the chain sequence of the innovation process and integrated strategic models were developed by economists, and among these models a communication model was created by Kiryakov A.G. and Maximov V.A.

Traditional, East Asian and alternative base models of the innovation development are also applied in agriculture as well as in

other fields in currently developed and developing countries of the world. Alongside with this attempts are made to create new innovation process models. These models are based on the idea which will penetrate social life, technological systems, business, etc. all areas of innovation composition in practice.

The researches show that as far back as the 70s and 80s of the last century, the innovation model of Japan was based on the following principles:

- existence of the longterm scientific technical development program of the country;
- selection of large corporations as a reference center in the implementation of scientific and technical policy;
- motivation of applied scientific research and studies;
- rewarding for active obtaining licenses from foreign countries.

In our times the duration of innovation process in the developed countries lasts 5-6 years, and 15-25 years in moderately developed countries.

Technological Innovation Foundation established in Italy provides 15-year loans on favorable terms, % 80 of loans are issued during the implementation of the program, the remaining % 20 are given in the final stage of the program.

In the USA and Great Britain there is a system of credit insurance. Through this system, private banks guarantee reimbursement of % 80 of the value for 15-23 years.

The Holland model (experience) draws attention last years from the point of view of the effective management of the innovation process in agriculture. Thus, in the Netherlands, which covers an area of about 42,000 km², the value of food exports only in 2014 reached the level of \$ 80.7 billion. euros or 90 billion. USD. The Netherlands is the second large agriculture exporter in the world after the USA. The number of agricultural enterprises in the Netherlands, which covers about half of Azerbaijan land-wise, is more than 65 thousand. The number of farms in Azerbaijan is about 1600 and they are declining. It is time to benefit from the experience of the Netherlands in Azerbaijan, which has 9 of the 11 existing climates in the world. The Netherlands is a world leader in the export of ornamental plants and

vegetables, ranks the 4th in meat, liquid and solid fat exports, and the 3rd in milk and dairy products exporter in the world.

Our country lags behind other countries in a number of strategic products from the point of view of productivity in agriculture. For example,

Grain productivity is 50-55 hundredweight in Denmark and the Czech Republic, 60-65 hundredweight in Germany and France, and only 30 hundredweight in Azerbaijan. The annual milk yield of one cow in Azerbaijan is only 1000-1100 kg, in Latvia, Estonia and Germany it is between 5000-7000 kg. According to conditional cattle calculation the annual meat production in Azerbaijan is 50-52 kg, in Denmark this indicator is 230 kg, in Baltic countries – 150-160 kg. The basis of success in these countries is innovation technologies, cooperation, research and development, marketing strategies, long-term, sustainable agrarian policy. It is necessary to note that, last years the normative-legal acts, state programs adopted on the agriculture development, incorporated the core of agrarian policy. However, there is a lot to be done in this area. First of all ‘the concept on innovation development in agriculture’ has to be developed and implemented in order to achieve innovative development of the agricultural sector. It is true that a part of the provisions of the Concept that need to be compiled was already reflected in the Strategic Roadmap for Agricultural Development. We believe that it is possible to achieve the development of the concept by using the current work experience of Russian Federation.

In a globalizing world dynamic development of the economics in the economically developed countries is based on innovations, and their implementation is of strategic importance. The tax and depreciation regulation, credit and finance policy, price regulation, protectionism, the policy of liberalization of tax and depreciation legislation in place performs as a guarantor of innovative development in these countries. There, tax concessions for capital investments are usually provided in the form of an ‘investment tax credit’. As a rule, tax concessions investments are applied to expenses for purchase of new machinery, equipment, technologies. Tax concessions, unlike ordinary concessions, are usually withdrawn from payments based on

the benefit of companies. According to investments, the tax concessions come into force automatically after the new equipment has been put in use, in this case, it is not required to refer to any provisions of the legislation. The volume of concessions is determined by per cent based on the value of applied technique. Temporary exemption or partial reduction from income tax is applied in France, and refers to newly established small and medium-sized enterprises. In France, small and medium enterprises are exempted from paying 50% of income tax for 5 years. Profit (income) tax for start-ups in the UK is reduced from 20% to 1%. In these enterprises the upper limit of the tax exemption for investment is set to %50. Rapid depreciation of equipment is widely used in the developed countries to motivate the innovation of main funds. The depreciation period of the equipment and tools used for the Scientific research and Construction Projects Works in the USA is set as 5 years, and the service life is set as 4-10 years.

In Japan the accelerated depreciation period is set for the enterprises which use technologies applying the energy-saving equipment or effective using the resources, technologies less harmful to the environment. Different rates of accelerated depreciation are applied from %20 to %50. However, the most common rate is around %15-18.

In the UK, companies are allowed to remove the cost of technical equipment from the whole list in their first year.

In Germany this figure is around %40.

In the United States, this measure is applied after 3 years of service of the equipment, and that equipment is removed from the list at negligible prices. In general, machinery and equipment are removed from the list after 4-5 years of full service.

In France the accelerated depreciation is also applied to important equipment - energy-saving, environmentally friendly, information equipment. For example, a computer can be depreciated after 1 year.

Sometimes in foreign countries the state motivates the staff training to maintain innovation activity. For example, in France more than %25 expenditures on staff training are exempt from taxes. Acceleration of innovation commercialization in France is considered to be priority for state agencies. There, 74% of the funds allocated for technopolises are

provided by the state, as well as by regional authorities, because creation of technopolises contributes to the development of the economy of the region.

We consider that, wide use of the mentioned above experiences in the agriculture sector of Azerbaijan make possible the achievement of high economic results.

As to our opinion, there is no serious need to use venture capital in agriculture, because this business receives significant support from the state. However, agricultural production enterprises can benefit from that capital. Development of the agriculture insurance in our country, creation of loan guarantee fund on agriculture, development of a mechanism for the application of unsecured loans for innovative development are the problems waiting for solution.

4. The current situation of the innovation development in agriculture was analyzed and assessed with the help of systematic approach and different research methods. Their effective use made possible to identify the directions to join the countries with the high innovation development level for Azerbaijan, and The grounds for innovative development in the TLFO was identified.

Successful implementation of prepared by the national leader Azerbaijan model of agriculture reforms under the leadership of President Ilham Aliyev created a guarantee for the dynamic development of the agricultural sector. Thus, only in 2005-2019 the volume of product production in agriculture increased by 4.2 times, as well as production of plant products increased by 3.8 times, livestock products – by 4.8 times (table 1).

The basis of the obtained high results consists of increase of the sown areas for agriculture plants, as well as increase in the number of cattle and birds, alongside with increasing productivity.

In the period covered by analysis despite of the number of agriculture enterprises decreased by %17.5, and the number of individual entrepreneurs decreased by %66.0, the volume of total collection increased by %66.3; and productivity increased by %21.1.

As a result of systemic reforms in agriculture in the country the number of employed people involved in this field is % 55.4 during 24

years, their share of the employed population in the country increased from % 30.8 in 1995 up to % 36.0 in 2019 or 5.2 points.

Table 1. Gross agricultural output on economy categories (in actual prices, mln. manats) *)

	Years						Growth rate in 2005-2019, in percent
	2005	2010	2015	2017	2018	2019	
All economy categories, in total	1844,8	3877,7	5635,3	6580,0	7010,0	7836,7	4,2 dəfə
including: crop production	988,2	1999,2	2761,1	3019,0	3186,0	3751,2	3,8 dəfə
Livestock	856,6	1878,5	2874,2	3561,0	3824,0	4085,5	4,8 dəfə
In agricultural and the other enterprises, in total	68,8	192,6	410,1	645,2	660,9	713,2	10,4 dəfə
including: crop production	13,9	60,0	132,5	238,5	262,1	321,0	23,1 dəfə
Livestock	54,9	132,6	277,6	406,9	398,8	392,2	7,1 dəfə
individual owner, family-peasant, households, in total	1776,0	3685,1	5225,2	5934,6	6349,1	7123,5	4,0 dəfə
including: crop production	974,3	1939,2	2828,6	2780,5	2923,9	3430,2	3,5 dəfə
Livestock	801,7	1745,9	2596,6	3154,1	3425,2	3693,3	4,6 dəfə

As a result of ongoing targeted measures on improvement of material welfare of the population in our republic, the average monthly salary increased by 5.1 times in 2005-2019 to 635.1 manat, as well as in agriculture it increased by 8.9 times and amounted to 371.4 manat, and the share of the last increased from %33.7 in 2005 to %58.5 in 2019.

As a result of formation of ‘Agroservis’ OJSC the level of supply of fuel, seeds and new equipment in agriculture was substantially improved. Also the measures to improve the sex composition of livestock is continues in a complex way as one of the necessary elements of the competitiveness increase policy in agriculture sector of the country. During the last years 7106 heads of breeding cattle and

5,200 head of small cattle were brought to the country by “Agroservice” OJSC and were given to agricultural producers at a discount of 50 percent of their value.

During last years the effective organization of the sales fairs of agriculture products in Baku city, creation of private supply sales market, trade companies and logistic centers, modernization of packaging and packaging facilities, support for the organization of a network of ‘farm shops’ and ‘green markets’, establishment of meat cutting and sales centers in accordance with veterinary and sanitary requirements created a guarantee for the formation of innovation infrastructure in the field.

There was also started the implementation of practical measures towards improving of the institutional structure in agriculture production, the Law on 'On agricultural cooperation' of the Republic of Azerbaijan was adopted. This law considered the economic stimulation of peasant-farmer farms to merge in the form of larger agricultural enterprises.

At present there are taken measures on modernization and supply with new equipment of the laboratories and agrochemical laboratory operating under State Commission and State Seed Inspectorate, as well as scientific research institutes on Republic Veterinary Laboratory, State Phytosanitary Control Service, Testing and Protection of Selection Achievements.

As the result of wide scope analysis and assessment conducted in the framework of management improvement measures in agriculture, the needs for liquidation, privatization, reorganization and transfer to management of economic state enterprises and organizations the activities of which are not considered expedient and which operate under Ministry of Agriculture, were determined.

In the work, the present situation of agriculture production was widely analyzed, financial results of the agriculture enterprises were assessed. It is noted that the results obtained in this field, the level of self-sufficiency of the population with food products was significantly improved (Table 2).

Table 2. The rate of self-sufficiency with the food products (2019).

Products	The rate of self-sufficiency, in per cent
Beef	86,1
Mutton	97,6
Poultry	74,6
Eggs	101,8
Milk and dairy products	86,3
Grain	57,2
Vegetables	112,0
Potato	87,8
Vegetable garden products	100,8
Fruits and berries	123,1
Grapes	94,3
Sugar	75,0
Vegetable oils and margarine	65,9
Butter	69,5

Despite this, imports of agricultural and food products still exceeds the export of products of the same name several times. In the dissertation production and import of the dairy products in the national market, processing volume and import of fruits and vegetables, the share of this group of products directed to industrial production, indicators of the share of the agricultural sector in GDP are widely analyzed, and the comparison in foreign countries was shown. The researches show that despite the positive dynamics in the growth of agricultural production in the country, the growth is based on extensive factors. In farms cultivation of cereals, potatoes, fruits and vegetables was increased due to tea leaves, cotton, tobacco and grapes. At the same time fruit and berry fields were partially decreased. The structure of agricultural products in the country was formed unrationally on the account of extensive increase in production structure.

The increase in livestock is much more extensive, that means in this field the increase was achieved due to the increase in quantity of domestic animals. As the result of the extensive development of the livestock in the country winter huts and pastures, as well as arable land are overused, vegetation was severely damaged and soil erosion intensified. Globalization of the food problem today takes place under

the conditions of drastic climate change and rapid rise in food prices, increasingly complication to forecast the offer of agricultural products in global market. All these makes innovation orientation of agricultural production more and more necessary as the main factor of stabilization of agricultural production. Specification of innovations use in agriculture is connected with their use in the innovation process (agricultural production), different natural factors and components (plants and animals). The other characteristic of innovations in agriculture is that they do not necessarily guarantee the product applicationally produced in agriculture to exactly gain advantage in competitiveness on the market. When demand is outgrowing supply the opportunity of innovation rates decrease, quality increase, as well as competitiveness increase is created.

But in years when the yield is low innovations should serve first of all to improve the ecological environment of agricultural activity, to increase the resource potential of the agricultural sector.

Considering all these it is worth to note that agriculture depends on natural-biological and ecological factors. Thus, innovative development has to be managed in this directions, alongside with traditional production technological and organizational management directions innovation activity should also cover the selective genetic and economical social ecologic fields. In this context technical and technological modernization, ensurance of resource savings of the field, increase of the qualitative features of the produced products, improvement of ecological component of agriculture can be shown as key factors of the innovative development of the agriculture production in our country. It is known that the ratio or development tendencies of the different sectors of the economics in the country are assessed through different indicators. In a whole the indicators of the innovation environment are characterized by direct and indirect innovations factors. Alongside with this the innovation activity indicators are also widely used in practice. The all mentioned indicators are characterized by different factor level (value).

Without reducing the importance of the scope of varied innovation measures implemented in agriculture it is also necessary to mention that innovation development in agriculture in our country should be

brought closer to trends in accordance with global standards, fundamental changes should be implemented in the National Innovation System and in its integral part – agriculture.

We believe that, in the field of agricultural innovation the state has to take the funding of fundamental research upon itself. Here their is need of application projects directed to the exact demands to be supported by the state, however at the same time development of the economics on the basis of agricultural innovations can also be applied for the account of private funds.

In our opinion, creation of new agricultural production enterprises on the account of fundamental increase of the expenses for technology innovations in agriculture, modernization of the current enterprises will sharply reduce dependence on imports, alongside with ensuring the processing of agricultural products exported from the country to the foreign countries as raw material, will ensure the food security by increasing the level of self-sufficiency of the population at the expense of local production. In this case decrease of prices for food products will also be guaranteed in the domestic market. From the other side the mechanisms regulated by legislation (land mortgage, establishment of a mortgage bank, credit risk insurance, etc.) must be used for deepening the process of innovative development of the sector, because non-regulation from the point of view of land relations, land market legislation, institution and organization attracts attention as negatively affect factor.

5. Dependence of the total production area in agriculture on key economic indicators (fixed capital investments, commissioning of fixed assets, export of the product) was assessed due to the mathematical statistical methods by using the ready mathematical program packages, and relevant models were developed, the forecast of production volume in agriculture was given till 2025.

In modern conditions in the impact of the volume of products (works, services) produced in different sectors of the economy on GDP, as well as the impact on product volume, and assessment of the relationship between them, preparation of forecasts economic mathematical methods are preferred, and in this case the ready-made

mathematical software packages (EViews, Matlab, MS Excel, MathCad) are used.

On the basis of statistical data developed in Table 3 by using this software packages, investments in fixed assets, which affect the volume of agricultural production, granting use of fixed assets and correlations between agricultural exports was determined (Diagram 1, 2, 3).

As the result of the calculation it seems to be high correlation ($R^2 = 0,86$) expressed by the regression equation $y = 7,6837X + 1371$ between the total product release in agriculture in Azerbaijan and fixed capital investments. There exists high correlation ($R^2 = 0,5198$) expressed by the regression equation $y = 6,4283X + 2584,2$ between the total product release in agriculture in Azerbaijan and fixed capital investments.

Table 3. Key economic indicators on agriculture in Azerbaijan in 2000-2019 (in mln. manat)

Years	Fixed capital investments	Commissioning of fixed production assets	Gross product production	Export products
2000	7	21	1061	27
2001	9	4	1207	29
2002	19	5	1272	45
2003	38	11	1367	122
2004	35	14	1477	144
2005	41	48	1732	345
2006	58	37	1970	364
2007	243	117	2765	591
2008	337	141	3308	650
2009	267	120	3566	654
2010	431	111	3878	741
2011	437	98	4525	910
2012	649	234	4845	1060
2013	574	172	5245	1118
2014	364	210	5226	1073
2015	356	964	5635	990
2016	325	153	5632	1158
2017	618	326	6580	1120
2018	764	357	7010	1197
2019	769,5	662	7837	1312

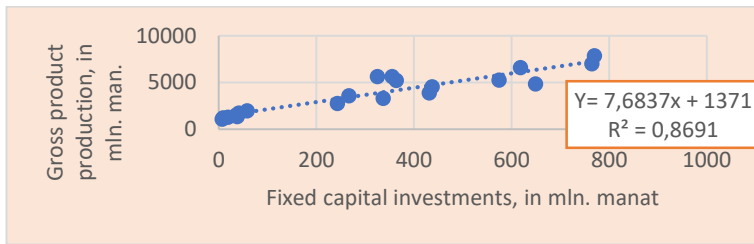


Figure 1. Correlation between fixed capital investments and total product release on agriculture in Azerbaijan

The dependence between the total volume of agricultural production and exported products was described as follows, and the functional dependence is formed as $y = 4.6532x + 631.09$, and this proved the high correlation between these indicators ($R^2=0,9394$).

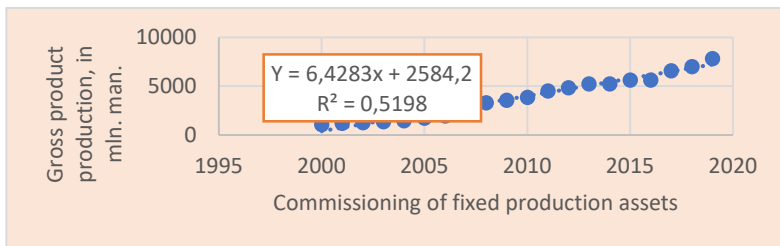


Figure 2. Correlation between commissioning of fixed production assets and total product release on agriculture in Azerbaijan

The impact of all three indicators on agriculture as a whole on total production volume was expressed by the following equation $Y = 2,195x_1 + 1,549x_2 + 2,947x_3 + 805,38$, and the high correlation was proved.

Based on the calculated elasticity coefficient, it was determined that this will result in a %1 increase in fixed capital investment, in % 0,183 increase in gross agricultural output, in %1 increase in the value of fixed assets, in % 0.08 increase in gross agricultural output, in %1 increase in volume of export in agriculture, in % 0,528 increase in gross agricultural output in agriculture in Azerbaijan.

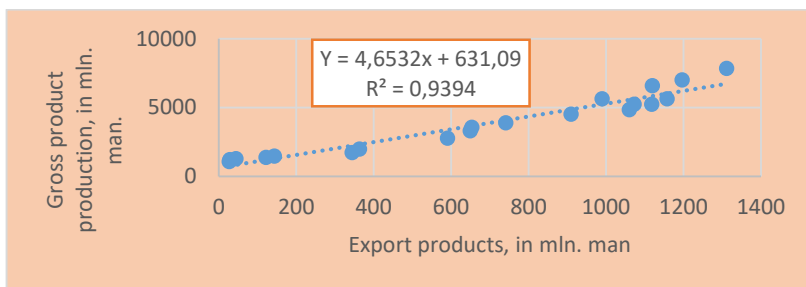


Figure 3. Correlation between export products and total product release on agriculture in Azerbaijan

It is necessary to note that it is possible to assess the ability of independent development of the agriculture on the basis of increase in investments in fixed assets on the account of increases in agricultural production.

With this aim the dependence of investments in fixed assets in agriculture on changes in gross domestic product was calculated by using the data indicated in Table 4. which expresses the cost of gross agricultural output and amount of investment in fixed assets, and on this basis there was obtained the equation $\Delta \dot{I}t^* = 24,888 + 0,26711 \Delta Yt-1$, which expresses the increase in investment due to the increase of the volume of agricultural production in Azerbaijan in 2002-2019. According to the a_1 (acceleration indicator) = 0,26711 index of the equation, we consider that the ability of agricultural enterprises to develop independently at their own expense was very low. Thus, agriculture developed almost % 73.3 due to external sources. This is explained by the fact that the acceleration rate is below 0.5, i. e. 0.26711. The amount of investment required for economic growth in agriculture in the long term can be determined on the basis of acceleration value of 0.26711.

The forecast of volume of gross agricultural output till 2025 was expressed as following by using MS Excel software on the basis of information expressed in Table 3 composed on the data of ARSSC (Diagram 4).

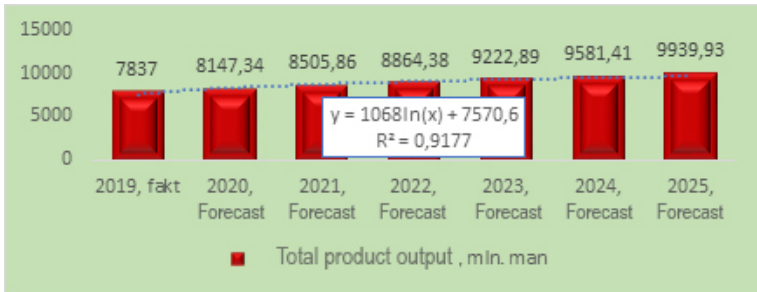


Diagram 4. The forecast of total product output in agriculture till 2025, (mln. manat)

As a result, compared to the actual data of 2019, the forecasted volume of agricultural production will be able to achieve 9939,39 mln.manat increasing in 2102,93 mln. manat (26,8%).

6. Special attention was paid to the issues of transition of the agrarian sector to the path of innovative development due to intensive factors, ensuring of the food safety in the country, efficiency and competitiveness increase in the domestic and foreign market, motivation of labor of the peasants. As a result of this, in order to ensure the accelerated integration of Azerbaijan to global economic system with the aim of attracting additional investments in the field there was developed the preparation and implementation of the special measures plan, improvement of taxation and insurance system, the concept of mechanisms of the innovation development management in the sector.

Strategic directions of innovative development of the agrarian sector at the international level are determined by the state. Modernization of the economics of the country, the transition to active innovative development is an important priority of agricultural policy in Azerbaijan. However, the realities require more effective and comprehensive measures to be taken in this area. To this end, it is important to develop a targeted innovative development program in all areas of agriculture. First of all, the program should reflect the state financial credit support, modernization of material technical basis of the enterprise, development of the product processing, increase of the role of innovation development in production, improvement of the development mechanisms of the agroindustrial integration, price

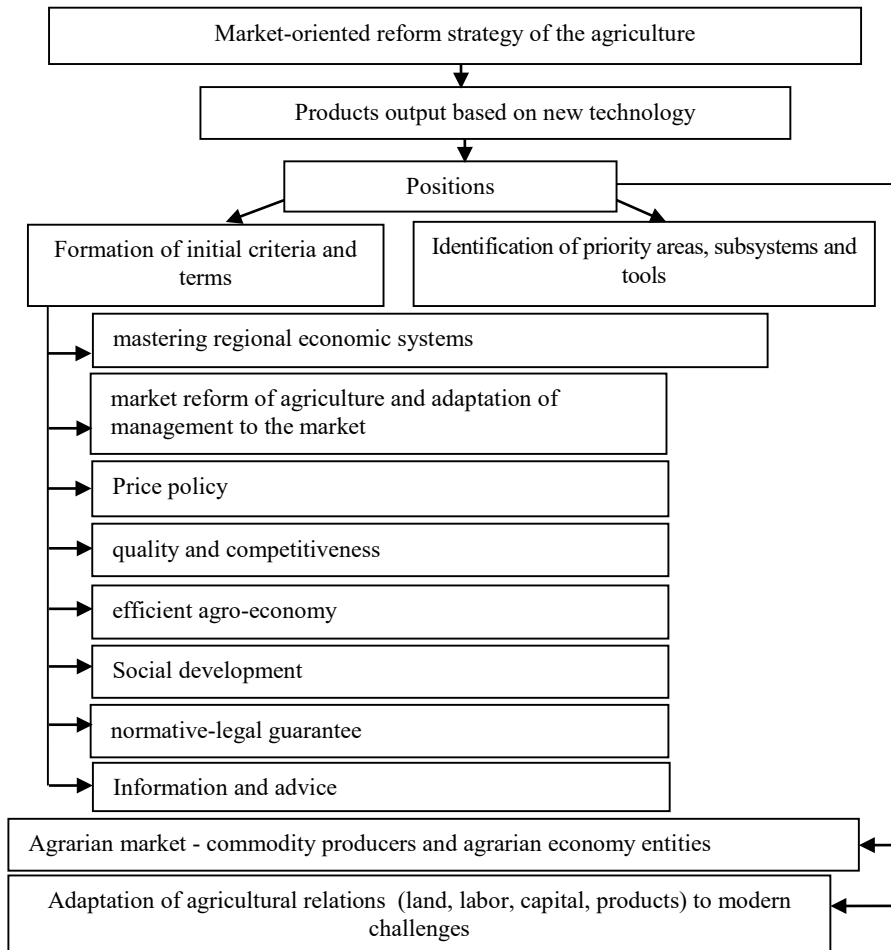
policy, stimulation of the direct sales on the basis of this type products production, creation of improved agrarian service system, wide network of supply points, enhancement of the innovation infrastructure. With this aim the strategy of market oriented reforms in agriculture was composed as a scheme (Scheme 2).

We consider that, innovation should be the financial mechanism providing this development on the regional and republic level as an important part of formed institutional environment of the development in agriculture.

They should assist in the on time financing of innovation systems development, creation and expansion of the innovations, as well as in financing of scientific and educational agriculture centers, scientific and technopark enterprises, the direct and indirect state regulation forms of the innovation activity financing have to be developed. It is important to create a fertile financial environment for the implementation of targeted projects in small high-tech enterprises, and it is important to use the funds of the venture fund for this purpose. In most countries of the world the network of that fund acts in the form of state, regional and payment agencies, and the use of this experience in our country can be considered acceptable. Considering the mentioned above the work covers formation of innovative development measures plan, priority directions of the investment attraction to the sector, improved scheme of the mechanism of innovative development management.

First of all for their implementation in real practice the member contact has to be established between science and industry in agriculture, and provision of modern laboratories, devices and equipment of field scientific research institutes should be improved, the process of delivery of new technologies, plant varieties, animal breeds, bee species, control mechanisms and other innovations developed in the scientific research institutes to farmers should be intensified by means of information and consulting service as soon as possible. Based on world experience we can say that, modernization of innovation infrastructure in agriculture in Azerbaijan, implementation of large projects on innovative development of the agriculture sector of the economics is possible by attracting domestic and

international capital only on the basis of private and public partnership. In the work the directions of that partnership was reflected in the form of a diagram, and we consider that the following measures should be taken for its effective development in the field of property relations:



Scheme 2. Market-oriented reform strategy of the agriculture

- effective legal (and other) protection of private property rights;
- accurate classification of property rights, especially in the field of

intellectual property;

- development of a system of legal and normative acts regulating relations in the field of intellectual property;

- state policy setting transparent 'rules of the game' on small, medium and large private property

- the measures on legitimization of large private property should increase the owner's ability to use it effectively, as well as should solve problems arising during court proceedings at least in part due to its legality.

It is possible to create a guarantee for high competitiveness and stable development of agriculture by applying innovation and investment strategy. With this aim the priorities of this development way was determined in the work. Taxation and insurance systems, depreciation policy plays an important role in ensuring of the innovation development in agriculture. In order to fill the gaps in this area in Azerbaijan the options below are advised to be implemented with the aim of improvement of the taxation policy in the scientific innovation field in agriculture: The first variant. Complete exemption of innovative enterprises and organizations from all taxes and fees, on the other hand, progressive income tax in the agricultural sector. The second option. Tax reduction and granting significant privileges on separated taxes in acceleration of innovation processes.

For the agricultural scientific enterprises a part of profits directed to purchase of special high quality planting materials as equipment, scientific devices, tools, reagents, preparations, elite seeds and animals, fruit and berry crops should be exempt from taxation, and as well as tax exemptions should be considered during the gratuitous transfer of scientific equipment, techniques, devices to other enterprises and higher education institutions. The insurance of researches and experts of agriculture sector in the country is inevitable in order to protect them against innovation risks. For this, the use of advanced insurance system of the economically developed countries in the agriculture of our country can perform as a motivation mechanism at all stages of the innovation activity.

7. The expediency of agrarian - processing industrial districts in the large settlements of the administrative regions in

Azerbaijan, and creation of agro-parks in rural settlements were justified on the basis of methodological approaches used in the international practice, their number is forecasted on options for long-term period, the impact on regional gross domestic product, field production and job creation was identified.

In the context of strict requirements of the market economics transition of agriculture to the intensive innovation development way by widely used ICT is possible only under conditions of formation of the wide network of the relevant infrastructure only, and ensuring a high level of employee satisfaction with information.

Expansion of the innovation infrastructure network in the field throughout the country will guarantee the innovative development, successful formation of value chain, timely and lossless supply of agricultural products, their deep processing in the country, production of import-substituting and export-oriented processing products, increase of the level of self-sufficiency of the population in agriculture and food products without diminishing importance of the complex measures and reforms, structure changes implemented in this sector during last years. In order to achieve this, innovative recycling process and the environment of its institutional improvement environment must be formed in agriculture. In the work their principal structure is proposed. When determining the network of innovation infrastructure in the agricultural sector the features of production process in the field, current development level of innovation infrastructure, market economy needs and targeted development indicators should be considered. One of the most common elements of innovation infrastructure in the researched field is agro-park. Its motherland is considered to be the Netherlands. But in China, India, Turkey, the USA and the other countries organization of agro-parks plays an important role in ensuring of the food safety.

In accordance with the data of Ministry of Economics, in our republic it is planned to create 51 agro-park and large farms on the territory of 33 regions in the amount of 257 thousand ha in the value of 2.2 billion manat. In present almost 30 agro-parks operate. The development concept of agro-parks in Azerbaijan mainly consists of increase of the export potential, creation of national brands, increase

of the innovative practice of small and medium farmers, creation of a close coordination system between the agriculture sector and production enterprises, provision of integration among producer, worker and consumer, achievement of high productivity, improvement of highly qualified specialists in agriculture and opening of new work places. Commissioning of agro-parks in the country is considered to be a main indicator. Today the agro-parks organized in Absheron, Shamkir, Yalama and the other regions enabled the effective activity of individual entrepreneurs and farmers. The expansion of the network of agro-parks, agribusiness incubators and startups in the increase of priorities on value chain of production potential of agricultural products on production and processing of agriculture products in Azerbaijan was considered in the Strategic Road Map for the 2025 and the further period. In this regard, the expansion of the network of agro-parks is inevitable. Creation of agro-parks or agro-clusters in rural settlements with a population of more than 2,000 people in the near and distant future in Azerbaijan can be considered economically and socially efficient.

According to the data of ARSSC by the beginning of 2019 there were 327 rural settlements with a population of 2001-3000 people, 205 rural settlements with a population of 3001-5000 people and 92 rural settlements with a population of more than 5000 people. Their total number composes 624 units. In addition to this, there are 261 settlements in the country with population more than 2000 people. If we take into account the agro-parks created in the last two years, it means that it is possible to create 312 additional agro-parks in the period after 2020 (Table 4).

To our opinion the scope of agro-parks to be established in rural settlements with a population of more than 2000 people should be wider, there, the production, processing and logistics of agricultural products must be resolved systematically. If so, the volume of final product produced in each agro-park and the number of jobs created there should be substantially increased. The different options of these indicators after 2020 were expressed in the Scheme of the work.

Table 4. The number of agro-parks which can be created in the rural settlements with a population of more than 2,000 people in Azerbaijan

Indicators	in SRM in 2019- 2020	Forecast	
		in 2021- 2025	after 2025
Total number of agro-parks that can be created in the country	51	112	200
including: in the regions of the country	44	100	181
in Nakhchivan Autonomous Republic	7	12	19

The calculations show that in the period after 2025 the production volume in each proposed agro-park will compose 28.5 mln. manat, and the number of work places will compose 280 units, and this will be 3.4 times and 1.4 times higher than the expected figures of the same indicators in 2020 respectively.

To our opinion, the agro-parks to be created should be characteristic for the regions with population more than 90 thousand people. In this case, the priority must be given to create 6 agro-parks in Ganja-Gazakh economic region, 4 in each of Sheki-Zagatala and Lenkaran economic regions, 3 in Guba-Khachmaz economic region, 12 in Aran economic region, and 3 in Upper Garabagh region. But this do not mean that it is not favorable to create agro-parks in the other regions. We consider that a new division of territories was determined for carrying out of actions in territories on the basis of the single program for restoration of the liberated territories (TLFO), ensuring future development, creation of necessary infrastructure, and with the aim of efficient use of economic and natural potential in accordance with the Decree ‘About the new division of economic regions in the Republic of Azerbaijan’ of the president of Republic of Azerbaijan Ilham Aliyev dated after July 7, 2021. This division was increased from the previous 10 economic regions to the present 14. Garabagh and Zengezur economic regions were created. This planning aims to ensure flexibility in economic governance, and can give opportunity to create new infrastructure in the regions. Creation of specialized or mixed

type agro-park in each agricultural region according to its specific feature will allow to achieve high economic results.

The organizational structure of the modern agro-park is proposed in the dissertation in accordance with the international experience. To increase the efficiency of agro-parks activity, the creation of which is considered important, establishment of industrial districts based on agrarian processing in about 10 areas, minimizing costs will allow to ensure closer integration between agriculture and industry. We consider that, such industrial and service districts should be created first of all in the settlements located in economic regions. While formation of these districts the priority should be given to start-up network producing different products and based on state-private economy.

In the scope of new agro-parks and industrial districts to be created creation of the appropriate structure for information access as well as staff training, finance, sales infrastructure is also important.

8. Methodological and practical recommendations were developed in the direction of modernization of innovative management system in order to improve the training of qualified personnel in the context of ensurance of dynamics of innovation processes in agriculture, to adapt the current management system in agriculture to the new economic challenges based on the application of indicative plans, to use effectively the current innovation potential of the sector.

Large resource potential, as well as human resources was accumulated in agriculture sector of Azerbaijan, however they are still not used effectively, and the labor productivity is low.

In present although %36 of the employed population in the country is concentrated in the agricultural sector, the GDP of the production there is only % 5,7. Innovation development of the economics demands creation of high-productivity and high-income work places. It means that formation and development of the human capital is of great importance as the most valuable resource in ensurance of competitiveness and efficiency of the sector. Today the formation of a real mechanism for managing human capital in the agricultural sector of the country is conditioned by the following reasons:

- reduction of the absolute size of the rural population, as well as youth, respectively, the reduction of the share of youth in the structure of the rural population;
- absence of conception and regional programs of human capital formation in agriculture sector;
- low level of employment of experts in agriculture sector;
- loss of the human capital for different reasons;
- failure to achieve serious results in research of the problem - usually separate areas, some aspects of them are researched in retail;
- low level of working conditions and living standards of the rural population has a negative impact on the reproduction of human capital;
- low investment in corporate human capital development by the most of the organizations and ownerships in agriculture sector, reduction of their interest in the reproduction of highly qualified professional human capital as a whole, etc.

It is also worth to mention that the problem of human capital management in agriculture sector is quite complicated issue, from the other hand, the agriculture economy is also not researched enough. All these condition the importance of new methodological and practical real approaches to formation of the human capital in the framework of the single mechanism in this field. This mechanism should be specified according to the social economic conditions of each region in our republic, should be directed to the solution of current and strategic tasks by conducting purposeful monitoring:

- creation of favorable social economic conditions for reproduction of human capital and process management;
- management of the development process of the human capital;
- reduction of risks of human capital loss;
- increase of the human capital realization level.

Considering the mentioned above, the principal scheme of the mentioned mechanisms, efficiency criteria of the human resources policy, structural scheme of the human resource management is proposed in the work. In the context of multi-sectoral and market relations the nature of the organization of agricultural production changes, the independence of economic entities, their individual requirements for scientific and technical achievements, the nature of

the development of the agricultural sector on a scientific basis increases. All these are realized through the self-organizing mechanisms of the scientific research activity. The implementation of this mechanism is carried out on the basis of apply of indicative plans. In the process of planning and mastery of innovation projects the following principles should be considered:

- strict adherence to newness in planned and mastered innovations;
- achieving significant results in scientific, technical and social economic indicators through the implementation of innovation projects;
- ensuring of high efficiency of innovations and guarantee to pay their own expenses while applying of innovations to production.

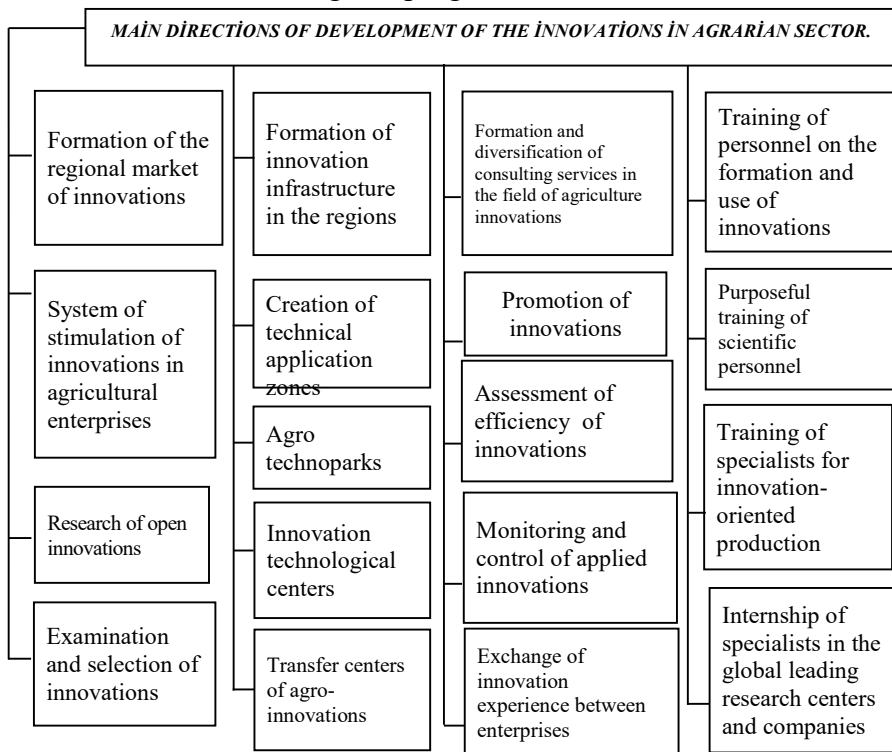
The specific feature of indicative planning dedicated to determination of ways to increase the efficiency of the agriculture sector is its acting as a biotechnical economic system.

Thus, the objective cycles of the livestock and plant production (biosystem) ultimately determines the scales of processing industry and other spheres (technical technological system). The following can be shown as specific features of indicative planning, regulation and management in agriculture sector: a) obtaining of the last results and at the same time its optimiation on the level of each field; b) an area that is integrated in accordance with the principle of purpose and assignment; c) substantiation and specialization of the sustainable production area structure of the griculture enterprises, considering the legitimate and perspective development parametres between livestock and cropping; d) considering the parametres of production development by taking into account the natural climatic and economic conditions; e) substantiation of organizational economic and production structures by considering the development of the integration processes.

Taking into consideration the mentioned above, the stages and models of the indicative panning system are proposed in the work.

As the result of the SWOT analysis of the innovation potential of agriculture in the country the main directions of innovative development of the field are defined in the following way (Scheme 3),

the necessity of establishment of an agro-technical park in the field is justified, its principal scheme is proposed, the development directions of the rural consumer cooperatives were determined by developing in the framework of the targeted programs.



Scheme 3. Main directions of development of the innovations in agricultural sector.

The ‘Conclusion’ part of the Dissertation covers the methodological and practical proposals and suggestions which allow the improvement of the existing mechanism of innovaton development management in the agriculture sector. Here is a summary of some of them:

1. There is no universal strategy and model of implementation of the innovation measures into agriculture sector. It is from this point of view the content of strategical management of the innovation

processes are unique, the methods of implementation can not be applied to the production of other innovation products. We consider that, a number of factor impacts the choosing of suitable strategy of the innovation processes management, as well as market position of the innovation application, changes dynamics taking place here, technical potential while production and service of the product, economic situation and cultural environment.

2. As a logical result of the conducted research the logical structural model of the development and management of the agricultural production on the basis of innovations was given in the work. To our opinion, the next stage is development of the innovation projects. Under the name of innovation projects there should be considered a set of interacting with each other measures directed to creation and spreading of new product types and technologies. However, this interpretation should be understood as a narrow interpretation of the content of innovations. For the understanding of the innovation in a wide scope it is required to make definite additions.

3. In modern times the accelerated innovation of technical and technological basis of the agricultural production is required, under conditions of competitiveness on global markets high quality agricultural products are offered. In order to protect the national interests on the global markets the use of high technologies became one of the priority issues. From this point of view it is very important to accurately identify the content of assessment of competitiveness indicators. It is the correct identification of these indicators that can lead to accurate analysis results. The description of these indicators are given in the work, and their limit calculated on the basis of actual materials was analyzed.

4. The global experience shows that the perspectives of venture financing of the innovations attracts the attention of analysts increasingly. The use of experience of Canada and China on agriculture development and venture financing can push the innovative development of agriculture sector in our country. Azerbaijan possess sufficient financial resources to form venture funds.

5. Our analysis shows that innovative development of agriculture also depends on the staff training, their education, different levels of technical and technological training of the experts and their business qualities.

Thus, there is an important necessity of implementation of the effective measures in the field of mastering modern knowledge in agricultural training. For this reason special attention has to be paid to staff training in accordance with the set requirements in the high, secondary special and vocational education schools located in the regions. With this aim the principal structure of staff management under the influence of internal and external factors in the agricultural sector is developed in the work.

6. For the valuable increase in local production in agriculture we advice to implement a number of measures directly. They are as follows:

- strengthening the financial security system, restructuring of debts of agricultural producers to budget and non-budget funds, fuel and energy resources at all levels;

- acceleration of development of new economy mechanisms to ensure the adoption of enterprises to the new economic conditions and th mechanisms of their implementation, as well as optimization of the difference in prices for between agricultural products and the products of the other economic sectors;

- organization of the specialized financial system in order to provide services to commodity producers in the agricultural sector;

- organization and development of the innovation infrastructure in all regions of the country. the improved organization structure of agro-park was proposed, and the number of work places to be opened and the efficiency gained from them is calculated in the work.

- Private investment attraction, leasing on favorable terms should be expanded in order to provide mobilization of state credit resources and to organize the production of agricultural machinery;

- ensuring the development of the insurance system in agriculture taking into account the new economic conditions;

- Development of program on the measures for improvement of the technical supply of agriculture.

7. The role of the state in identification of the priority directions of investment and innovation activity development in agriculture should be increased in connection with the modernization of the agricultural sector. Taking into account the importance of this issue, the targeted programs on innovative development of the separate agriculture fields should be developed in cooperation with the regional execution bodies of the Ministry of Agriculture of Republic of Azerbaijan. These innovation programs should be prepared on the basis of state financial credit support and should cover the modernization of the financial technical basis of the enterprises, development of product production, increase of the role of the science in the innovative development of production, improvement of the mechanisms of the agro industrial integration development, price policy, direct sales, staff training, infrastructure formation, stimulation of the qualitative production and other measures. With this aim the reform strategy of the agriculture market is proposed in the work.

8. Formation of the fund mechanism can be also the most advanced financial support mechanism for innovation in Azerbaijan. Its essence is that the departments of the fund provide financial support for the development of recipients on the basis of specific projects and established rules. This support is provided not only by allocating funds, but also by covering the other costs and purchases of agricultural producers.

9. As to our opinion, a list of investment sites in Azerbaijan should be formed with the aim of increase of the investment attractiveness to the agriculture, and development of the new agricultural productions. A list of investment sites should be formed by adapting the existing infrastructure conditions of land plots to the requirements set by investors. At the stage of selection of investment sites, the cost of laying the missing infrastructure on the site should be determined.

10. Creation of agro-parks, agrarian-processing and service districts in settlements in rural areas of the republic with a population of more than 2000 people will have high social economic and synergistic effect.

11. Increase of the quality of agriculture, production of import-substituting processed products, development of public-private

partnership, formation of infrastructure to support the development of agribusiness in order to increase the production capacity of agricultural products on the value chain will enable innovative development of the agrarian sphere.

12. Promotion and support of the agricultural and processing industry products export, brand creation, and formation of such infrastructures for their sale in the large cities of republic and foreign countries as 'Green Market', 'Farmer's Shop', 'Trade House' in a whole will expand the innovation activity in the agriculture. Alongside with this, we consider that close functional relations should be formed between the agricultural production and scientific bodies. This relation will make possible the commercialization of scientific institutions, modernization on the basis of innovative technologies of agriculture.

The main content of the research is reflected in the following published scientific works.

1. Current state and development prospects of agrarian entrepreneurship. News of Azerbaijan National Scientists Academy. Economics series, scientific and practical journal 2009 – No. 4, p. 53-57

2. The value of cooperative ties in the sustainable development of the agricultural market. Actual problems of economics, sociology and law under modern conditions. Articles and theses of the 7th International scientific practical conference. Patigorsk city -2010, p.89-94.

3. Theoretical methodological features of the ntrepreneurial activity. News of Azerbaijan National Scientists Academy. Economics series, scientific and practical journal 2011-No. 4, p.34-38.

4. Directions of entrepreneurship development in Azerbaijan and improving the living standards of the population. Monography. 'MEGA-H' publication, Baku-2012, 358 p.

5. The main provisions of the concept of innovative development management in the agricultural sector. News of Azerbaijan National Scientists Academy. Economics series, 2013 No. 3, p.189-193.

6. Assessment of situation of the modern entrepreneurship in Azerbaijan. Scientific practical journal 'Cooperation' No. 3 (30)-2013, p.56-62.
7. The issues of innovations development in agriculture. 'Azerbaijan Agriculture Science' scientific theoretical journal 4 (231) 2013, p. 19-22.
8. The modern tendencies of the innovation process in AIC of Azerbaijan. 'Agrosvit' scientific practical journal No.1, Kiev -2014, p.39-42.
9. Agrarian reform as a criterion of economic development. 'Azerbaijan Agriculture Science' scientific theoretical journal 2 2014, p. 21-25.
10. Modern development directions of the innovation potential of agriculture. 'Cooperation' scientific practical journal No.3 (34)-2014, p.4-10.
11. The role of the innovation development of agriculture in provision of food safety. 'Economics and entrepreneurship' journal No.9, Moscow -2014, p.125-128.
12. Some theoretical aspects of the agricultural innovations. Azerbaijan Cooperation University. The materials of international scientific practical conference 'Regional economy policy and development of cooperation'. 'Cooperation' publishing. Baku-2014, p.655-657.
13. The features of the market mechanisms of the innovations implementation in the global experience. The news of Azerbaijan National Scientists Academy. 'Economics' series, scientific and practical journal 2015-2, p. 41-45.
14. The directions of implementation of the global experience into the innovation process management. 'Azerbaijan Agriculture Science' scientific theoretical journal 2 2015, p.18-21.
15. Directions of innovative organization of marketing in agriculture. Az. Scientific works of SRIA and TI 4. Baku-2015, p. 20-26.
16. Organization of innovation activity of the agricultural enterprises in foreign countries. 'Cooperation' scientific practical journal No.4 (39)-2015, p.156-161.

17. Assessment of the modern development of agriculture in Azerbaijan. 'Scientific review' scientific journal No. 15, Moscow-2015, p.322-326.

18. Development of the innovations in the agricultural industrial complex. Azerbaijan Labour and Social Relations Academy. The materials of the scientific practical conference 'Innovativ social economic development of the regions: realities and perspectives' dedicated to the 92nd anniversary of National Leader Heydar Aliyev. Baku-2015, p.139-141.

19. Trends in the development of agriculture in modern conditions in Azerbaijan. Ministry of Labour and Social Protection of Population of Republic of Azerbaijan. Scientific research and training centre on labour and social problems. 'Labour and social problems' Collection of scientific works No. 1 (17) 2016, p.61-66.

20. Agriculture in Azerbaijan and directions of its innovative development. Scientific Bulletin of Poltava University of Economics and Trade No. 2 (74) 2016, p.135-141.

21. Solution of the food safety problems in Azerbaijan in the context of its innovational development. International scientific practical journal 'Economy and State' No. 11 2016, Kiev, p.49-53

22. Analysis of the innovative factors of agriculture. 'Finance and Accounting' journal 11 (293) - 2016, p.34-39.

23. The ways to increase the human resource potential in agricultural sector. Azerbaijan University, scientific journal 'Silk Way' No. 4, 2017, p.5-13.

24. The impact of the innovative development on ensuring of the food safety economy in Azerbaijan. Russian National scientific practical journal on economics 'Russian entrepreneurship' No. 14, July, 2017. p.2195-2205.

25. Directions of the innovative planning in agriculture. Economics Institute of ANAS. International scientific conference 'Strategical economic reforms: active tax policy and taxation problems' dedicated to the 70th anniversary of prof. Akif Musayev. 2017, p.163-168.

26. Mechanisms and modern experience of innovation processes management in agriculture. Azerbaijan Institute of State Building and

International Relations. 'REVIVAL - XXI CENTURY' journal. 2018,p.167-175.

27. Modern issues of the agriculture in Azerbaijan. INVESTMENTS: practice and experience. Scientific practical journal No.15 August, 2018, Kiev, p.33-35.

28. Clusters development in agriculture. International scientific practical conference 'Ensuring of food safety of Independent Azerbaijan State and the issues of competitiveness increase of the agriculture' dedicated to the 100th anniversary of Azerbaijan National Republic. 2018, p.362-368.

29. Some features of the modern development of agricultural innovations. International scientific practical conference dedicated to the 60th anniversary of the Economics Institute of ANAS 'Economic growth and social welfare'. 2018, p.349-353.

30. Innovative development as the basis of the sustainable economic growth in agricultural sector. Baku Business University, Union of Economists of Azerbaijan. International scientific practical conference 'Strategic Road Map on perspective development of the national economics: priority directions of human capital formation' dedicated to the 70th anniversary of prof. Islam Ibrahimov. 2018, p.155-166.

31. Improvement of the highly qualified personnel training in agriculture. Materials of the 7th International scientific practical conference 'Actual problems of social labour relations' dedicated to the 60th anniversary of foundation of the Social economic researches Institute DBIC - RAC (Makhachkala, November 22, 2019), p.160-16

32. Modern directions of the innovation activity in agriculture. Azerbaijan University Scientific Journal 'Silk Way' No. 1, 2020, p. 46-52.

33. State support to the development of the agricultural sector under modern conditions of economic development in Azerbaijan. Interscience of 35th international scientific practical conference 'Management and economics issues: current situation of the actual problems' No. 5(33) May, 2020, Moscow, p.38-45.

34. Economical – through the use of mathematical methods in the production of macro parameters to assess the impact on agriculture. *Journal of Critical Reviews*. JCR. 2020; 7(9): p. 1-8.

35. Clusters as the basis of innovative development of agricultural sector. *Science of Russia: Goals and tasks*. Collection of scientific works on materials of 25th international scientific practical conference, February 10, 2021 SPC Publication ‘L-Journal’, Part I, Yekaterenburg, p.163-167.

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