ISSN 2181-9408



Scientific and technical journal

Sustainable Agriculture

№4**(16).202**2







Chief Editor

Salohiddinov Abdulkhakim Vice-rector for international cooperation Professor at "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Doctor of technical sciences

Scientific Editor

Yunusov Iskandar

PhD, "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers"

National Research University

Editor

Hodjaev Saidakram

Associate professor at "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University, Doctor of technical sciences

Candidate of technical sciences

EDITORIAL TEAM:

S.Umurzakov, PhD, Deputy Prime-Minister for Investments and Foreign Economic Affairs - Minister of Investments and Foreign Trade of the Republic of Uzbekistan; **SH.Khamraev**, PhD, minister, Ministry of the Water Resources of the Republic of Uzbekistan; **H.Ishanov**, PhD, chief specialist, Cabinet Ministers of the Republic of Uzbekistan; **Dr.Prof.B.Mirzayev**, Rector of "TIIAME" NRU; **Dr.Prof. A.Pulatov**, Vice-rector for research and innovations, "TIIAME" NRU; **Dr.Prof. A.Pulatov**, PhD, associate professor, "TIIAME" NRU; **B.Pulatov**, PhD, "TIIAME" NRU; **G.Bekmirzaev**, PhD, "TIIAME"NRU; **M.Amonov**, PhD, associate professor, "TIIAME" NRU; **Sh.Khasanov**, PhD, associate professor, "TIIAME" NRU; **Sh.Khasanov**, PhD, associate professor, "TIIAME" NRU; **Dr.Prof. O.Tursunov**, Chief Scientific Secretary of the Agricultural and Food Supply Production Center; **Sh.Murodov**, PhD, "TIIAME" NRU; **Dr.Prof. O.Tursunov**, "TIIAME" NRU; **M.Juliev**, PhD, "TIIAME" NRU; **Dr.Prof. A.Karimov**, "TIIAME" NRU.

EDITORIAL COUNCIL:

Dr.Prof.N.Vatin, Peter the Great St. Petersburg Polytechnic University, (Russia); Dr.Prof.Y.Ivanov, Russian State Agrarian University - Moscow Timiryazev Agricultural Academy, executive director of Engineering and Land Reclamation named after A.N. Kostyakov, (Russia); Dr.Prof.D.Kozlov, Moscow State University of Civil Engineering - Head of the Department Hydraulics and Hydraulic Engineering Construction of the Institute of Hydraulic Engineering and Hydropower Engineering, (Russia); D.Ziganshina, PhD, Scientific Information Center of Interstate Commission for Water Coordination in Central Asia; J.Lubos, associate professor at "Department of Water Recourses and Environmental Engineering" of Slovak University of Agriculture in Nitra, (Slovak); Acad.Dr.Prof.P.Kovalenko, National Academy of Agricultural Sciences of Ukraine, Advisor to the Director of the Research Institute of Melioration and Water Resources, (Ukraine); Prof.N.Xanov, Head of the Department of Hydraulic Structures RSAU – MAA named after K.A.Timiryazev, (Russia); Krishna Chandra Prasad Sah, PhD, M.E., B.E. (Civil Engineering), M.A. (Sociology) Irrigation and Water Resources Specialist. Director: Chandra Engineering Consultants, Mills Area, (Janakpur, Nepal); Dr.Prof.A.Ainabekov, Department Mechanics and mechanical engineering, South Kazakhstan State University named after M.Auezov, (Kazakhstan); Acad.Dr.Prof.T.Espolov, National academy of sciences of Kazakhstan, Vice-President of NAS RK, (Kazakhstan); I.Abdullaev, PhD, the Regional Environmental Center for Central Asia, Executive Director; Sh.Rakhmatullaev, PhD, Water Management Specialist at World Bank Group; A.Hamidov, PhD, Leibniz Centre for Agricultural Landscape Research ZALF, (Germany); A.Hamidov, PhD, Leibniz Centre for Agricultural Landscape Research ZALF, (Germany). A.Gafurov, PhD, Research scientist at the department of hydrology, GFZ Potsdam (Germany). Dr,Prof. Martin Petrick, Justus-Liebig-Universität Gießen JLU Institute of Agricultural Policy and Market Research; Eldiiar Duulatov, PhD, Research Fellow, Institute of Geology, National Academy of Sciences, Kyrgyzstan; Gisela Domej, University of Milan-Bikokka Professor of Earth and Environmental Sciences, Italy; Moldamuratov Jangazy Nurjanovich, PhD, Taraz Regional University named after M.Kh. Dulati, Head of the Department of "Materials Production and Construction", Associate Professor, Kazakhstan; Muminov Abulkosim Omankulovich, Candidate of Geographical Sciences, Senior Lecturer, Department of Meteorology and Climatology, Faculty of Physics, National University of Tajikistan. Tajikistan; Mirzoxonova Sitora Oltiboevna, Candidate of Technical Sciences, Senior Lecturer, Department of Meteorology and Climatology, Faculty of Physics. National University of Tajikistan: Tajikistan; Ismail Mondial, Professor of Foreign Doctoral Faculty, University of Calcutta, India; Isanova Gulnura Tolegenovna, PhD, Associate Professor of Soil Ecology, Research Institute of Soil Science and Agrochemistry named after UUUspanov, Leading Researcher, Kazakhstan; Komissarov Mixail, PhD, Ufa Institute of Biology, Senior Research Fellow, Soil Science Laboratory, Russia; Ayad M. Fadxil Al-Quraishi, PhD, Tishk International University, Faculty of Engineering, Professor of Civil Engineering, Iraq; Undrakh-Od Baatar, Head of the Central Asian Soil Science Society, Professor, Mongolia; N.Djanibekov, Dr, External Environment for Agriculture and Policy Analysis (Agricultural Policy), Leibniz Institute of Agricultural Development in Transition Economies (IAMO) Theodor-Lieser-Str. 2 06120 Halle (Saale) Germany; A.Karimov, Dr, Head of the ICBA Regional representative office for Central Asia and South Caucasus.;

Designer: Malikova Madinakhon.

Note: Only the authors of the article are responsible for the content and materials of the article. The editorial board does not respond to the content of the article!

Founder: Tashkent Institute of Irrigation and Agricultural Mechanization Engineers Our address: 39, Kari-Niyaziy str., Tashkent 100000 Uzbekistan , www. sa.tiiame.uz

The journal "Sustainable Agriculture" is registered in the Press Agency of Uzbekistan on the 12th of February in 2018 (license № 0957).

In 2019, the journal is included in the list of recommended scientific publications by the Higher Attestation Commission of the Republic of Uzbekistan.

2

ARCHITECTURE. LANDSCAPE ARCHITECTURE
<i>Z.Abdurakhmonov, I.Musaev, U.Mukhtorov</i> Using remote sensing and GIS technologies to seasonal monitor agricultural land (Urta Chirchik district, Uzbekistan)
ECONOMY. ECONOMIC SCIENCE. OTHER BRANCHES OF THE ECONOMY.
A.Suvanov, B.Sultanov, R.Hakimov, S.Umarov, U.Kholiyorov, A.Chitose, M.Yamada Water resource management in Uzbekistan and raising its efficiency
<i>B.Sultanov</i> Methodological aspects of the development of agricultural reclamation
<i>A.Sh.Durmanov</i> Foreign experiences on increasing the efficiency of greenhouse farms and opportunities for their use
<i>B.Sultanov</i> Important aspects of foreign experience on improving the efficiency of land reclamation measures
<i>G.Dusmuratov</i> Prospects of operation of pumping stations on the basis of public-private partnership26
<i>S.Umarov, M.Raxmataliev</i> Ways to increase the efficiency of innovative activities in the poultry industry
<i>G.Dusmuratov, Q.Utegenov</i> Creating opportunities for the development of public-private partnerships for irrigation in Uzbekistan
S.Umarov, A.Berdimurodov An innovative approach to agricultural diversification
<i>U.Alimov, M.Kholikulov</i> Directions of state support for the development of the cultivation system of horticulture products
<i>A.Berdimurodov</i> Reforms in the field of science and innovation: factors and results44
<i>K.Nosurullaev</i> Risks of agricultural products and the need for insurance in developing countries
<i>J.Hasanov</i> Foreign experiences on effective use of information systems in small business and entrepreneurship55
<i>M.Li, M.Rakhimova, R.Romashkin</i> Current trends in the development of electronic commerce and digital economics61
<i>I.Yunusov</i> Possibilities of applying the best practices of foreign countries in the development of fisheries in the conditions of Uzbekistan
O.Ruzikulova, N.Komilova, L.Karshibayeva, B.Khalilova, S.Abdivaitova Regional aspects of maternal and child health in Uzbekistan
<i>O.B. Sattorov</i> Economic efficiency indicators for the development of intensive gardening73
<i>N.Kholmatova</i> Application of foreign experience in the development of fruit and vegetable clusters in Uzbekistan75

USING REMOTE SENSING AND GIS TECHNOLOGIES TO SEASONAL MONITOR AGRICULTURAL LAND (URTA CHIRCHIK DISTRICT, UZBEKISTAN)

Z.Abdurakhmonov, I.Musaev, U.Mukhtorov, "TIIAME" National Research university

Abstract

Currently, one of the most important aspects of agricultural activity in the whole world is the rapid development of remote sensing technologies provided with information, the creation of modern electronic cards and real-time monitoring systems is one of the urgent issues today. The desire to use remote sensing tools, information from anywhere in the world, constantly updating capabilities and geographic information systems and databases based on them is increasing. Agriculture of the Tashkent region makes up a large part of the region's economy and is the leader in our republic in this regard. It is important to develop new technologies in agriculture. Keywords: monitoring, agriculture, remote sensing, NDVI, mapping, land-cover change

Introduction. It is one of the main resources in agriculture in the study region. All activities on Earth have a spatial nature and are directly related to geography[1]. Therefore, GIS has become an indispensable platform for combining and analyzing large amounts of data of various types and formats, integrating and interacting with many enterprise-level systems[1,4]. The ability to quickly analyze this flow of data and visualize it in a cartographic image creates many new projects and opportunities for users in agriculture and related fields [5,7].

In general, remote sensing data and geographic information system (GIS) help to manage resources, coordinate actions and development strategies, register and inventory agriculture, create property and land cadasters and registers, and create geodatabases. will give[8–10]. Ultimately, at the producer level, it can increase productivity, reduce costs, provide detailed performance analysis and forecasting, help generalize knowledge to improve business and agricultural practices, and improve the accessibility and effectiveness of GIS data in many other areas. will give[9,11].

For this reason, it is necessary to create a model for forecasting the yield of agricultural crops using remote sensing data and GIS technologies[12,13]. This gives us the opportunity to place crops correctly, apply fertilizers at the right time, use chemical means to prevent crop failure, and predict crop yields in advance.

Study area, Data collection and Methods. Study area. The study area is located in Tashkent valley and Mid part of Chirchik river. The total land area of Urta Chirchik district of Tashkent region is 0.51 thousand km2. Most of its territory is located between the Chirchik river and the Tashkent canal, at coordinates 41°2'34.4"N 69°21'26.6E (Figure 1). The district, which was established on September 29, 1926, borders with Upper Chirchik in the northeast, Ohangaron district in the east, Tashkent city, Zangiota district in the north, Lower Chirchik in the west, Akkurgan and Piskent districts in the south, and the center of the district is the city of Nurafshon. The region of Middle Chirchik District is located on the plain on the left bank of the Chirchik River. The climate is continental, the average annual rainfall is 450-460 mm, and the vegetation period is 300 days. Tashkent named after Polvonov, Karasuv canals, and Chirchik river flow from the north-west of the district. In the south is the Tuyabogiz reservoir ("Tashkent Sea"). The main part of the soil is gray soil. The main part of the agriculture of the Middle Chirchik district is cotton and grain growing. Cotton is planted on 28,600 hectares of irrigated land, grain on 11,500 hectares, as well as potatoes, vegetables and rice, fodder crops, alfalfa and secondary crops are planted in the district.



Figure1. Location of research area (Source: GRID-Arendal).

Data collection. The series of images from the Landsat 8 OLI on NASA's Terra satellite (retrieved from https:// earthobservatory.nasa.gov/) documents the changes for analyzing of shrinking lake. At the start of the series in 2022 for spring, summer and autumn seasons. As the Urta Chirchik district is split into three satellite data for analysis data undertaken with the application of the Normalized Difference Vegetation Index (NDVI), as a remote sensing tool, Landsat 8 OLI images were used.

Methods. The NDVI is one of the most widely used vegetation indices and its utility in satellite assessment and monitoring of vegetation cover has been well demonstrated over the past two decades.

NDVI=(NIR-VIS)/(NIR+VIS)

Where, NIR - Near Infrared band of the satellite image (Band 4), and VIS (Band 5) of the satellite image.

NIR and VIS represent surface reflectance averaged over visible (λ ~0.6 µm) and near infrared (NIR) (λ ~0.8 µm) regions of the spectrum, respectively. The NDVI is correlated with certain biophysical properties of the vegetation canopy, such as the Leaf Area Index (LAI), fractional vegetation cover, vegetation condition, and biomass. NDVI increases near-linearly with increasing LAI, and then enters an asymptotic phase in which NDVI increases slight slowly as increasing LAI (Platonov et al. 2015).

Results and discussion. Monitoring of agriculture based on modern GIS technologies and remote sensing data is now becoming important. In this small study. If we look at the studied district, we can see the analysis of seasonal agricultural land changes. In this case, we can say that the change of agricultural crops is one of the main factors in crop rotation.



Figure 2. Seasonal changes in agricultural land areas.

From our analysis, we can see that the greenness index is high in the spring season, which means that wheat is the main agricultural crop in agricultural areas. Coming to the summer season, it can be seen that in the agricultural fields there are fields empty of wheat crops, and in the fallow fields we can see cotton as the main type of crop. It is possible to see that the arable land index showed a small index in the spring season, but the index is large in the summer.



Figure 4. Actual area of each index class of seasons. By the autumn season, the main indicators are changing

References:

1. Mamatkulov Z, Safarov E, Oymatov R, Abdurahmanov I and Rajapbaev M 2021 Application of GIS and RS in real time crop monitoring and yield forecasting: a case study of cotton fields in low and high productive farmlands ed L Foldvary and I Abdurahmanov E3S Web Conf. 227 03001

2. Yakubov G, Mubarakov K, Abdullaev I and Ruziyev A 2021 Creating large-scale maps for agriculture using remote sensing ed L Foldvary and I Abdurahmanov E3S Web Conf. 227 03002

3. Rakhmonov S, Umurzakov U, Rakhmonov K, Bozarov I and Karamatov O 2021 Land Use and Land Cover Change in Khorezm, Uzbekistan ed L Foldvary and I Abdurahmanov E3S Web Conf. 227 01002

4. Inamov A, Avilova N, Norbaeva D, Mukhammadayubova S, Idirova M and Vakhobov J 2021 Application of GIS technologies in quality management of land accounting in Uzbekistan ed V Kankhva E3S Web Conf. 258 03014

5. Denton O A, Aduramigba-Modupe V O, Ojo A O, Adeoyolanu O D, Are K S, Adelana A O, Oyedele A O, Adetayo A O and Oke A O 2017 Assessment of spatial variability and mapping of soil properties for sustainable agricultural production using geographic information system techniques (GIS) Cogent Food Agric. 3 1–12

6. Baban S M J and Luke C 2000 Mapping agricultural land use using retrospective ground referenced data, satellite sensor imagery and GIS Int. J. Remote Sens. 21 1757–62

7. Kavvadias A, Psomiadis E, Chanioti M, Gala E and Michas S 2015 Precision agriculture - Comparison and evaluation of innovative very high resolution (UAV) and LandSat data CEUR Workshop Proc. 1498 376–86

8. Malik M S, Shukla J P and Mishra S 2019 Relationship of LST, NDBI and NDVI using landsat-8 data in Kandaihimmat watershed, Hoshangabad, India Indian J. Geo-Marine Sci. 48 25–31

9. Dong T, Meng J, Shang J, Liu J and Wu B 2015 Evaluation of Chlorophyll-Related Vegetation Indices Using Simulated Sentinel-2 Data for Estimation of Crop Fraction of Absorbed Photosynthetically Active Radiation IEEE J. Sel. Top. Appl. Earth Obs. Remote Sens. 8 4049–59

10. Tam N T, Dat H T, Tam P M, Trinh V T and Hung N T 2020 Agricultural Land-Use Mapping with Remote Sensing Data Agricultural Land-Use Mapping with Remote Sensing Data

again in terms of cultivated areas, and the main index is given by newly grown wheat areas. Continuous observation and monitoring of cultivated areas using GIS technology facilitates the analysis of seasonal crop changes and allows to determine the accounting book of areas.

Conclusion. In conclusion, cropland monitoring with modern technologies and remote sensing data will involve high cost-effectiveness and rapid analysis. However, one of the shortcomings of the technology is that it is necessary to carry out field practice in the area under study to monitor crop types and their differences from weeds. Correlation of several indexes in currently used data analysis can increase the accuracy of the analysis. Therefore, I am currently conducting research on these issues in my scientific work, and I have published the first research results in this direction in this small article.

WATER RESOURCE MANAGEMENT IN UZBEKISTAN AND RAISING ITS EFFICIENCY

A.Suvanov, B.Sultanov, R.Hakimov, S.Umarov, U.Kholiyorov - National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" A.Chitose, M.Yamada - Tokyo University of Agriculture and Technology (TUAT), Japan

Abstract

The aim of this study is learn and analyze activity of distributing and managing the use of water resources by level of Water User Association (WUA) and explore possible measures to improve current water management in Uzbekistan with the reference to Japan's experience. On this paper authors try to learn and analyze activity of distributing and managing the use of water resources by level of Water User Association and find out some idea or concepts which can be potential application for Uzbekistan agriculture. state of the beekeeping industry, as well as factors affecting the dynamics of its development in the five leading honey exporting countries. The paper shows some sectoral features of the functioning of beekeeping and the dynamics of the sale of its products, organizational and economic mechanisms for the interaction of agricultural producers and processing enterprises.

Keywords: Water User Association (WUA), water management, Aichi canal, water shortage.

Introduction.During last two decades the share of agriculture in GDP decreased from 30% to 17% while provided steady growth in absolute volume of production. According to local indicator, the national economy is close to the structure of the economies of the dynamically developing countries of the world where agricultural production does not exceed 10% of GDP. An average annual growth rate in agriculture sector in last 5 years stabilized around 7 percent.

Structure of Agricultural land of Uzbekistan consists of three main types of regions (Sultanov et. al, 2008):

- mountainous regions - the area are more than 20 percent of the territory of the Republic. Dry farming (wheat, barley, peas, flax), horticulture and viticulture, spring and autumn seasonal grazing, farming, specializing in the production of meat and wool.

- irrigating farming region, where about 20% of the region Ferghana Valley, Mirzachul, Dalverzin desert, Chirchik - Akhangaran, Kashkadarya and Surkhandarya Sherobod valleys, including the Lower Amudarya zones. There are mainly produce cotton, wheat, rice, corn, potatoes, vegetables, melons and gourds, fodder crops, orchards and vineyards, mulberry and berries.

- desert-pasture regions, which is 60 percent of the national territory. The area consists of desert and dry plains. Mainly some part of Bukhara and Kashkadarya regions, Karakalpakistan and Navoi regions lands, and some area in the central part of the Ferghana Valley.

In order to achieve the projected parameters, government of Uzbekistan identified as the key objectives of the agrarian policy within the scope of WIS-II :

- the deepening of structural reforms within the agrarian sector and the diversification of agricultural production;

- the acceleration of the processes of the modernization and the technical and technological renewal of the agrarian sector, and of the infrastructure facilities and businesses that process agricultural products;

- the development and improvement of the infrastructure of the agro-food market;

- to increase the financial stability of farm entities, the liberalization of agricultural policy, and to strengthen the protection of the rights of agricultural producers through the following measures

- the improvement of mechanisms for the effective usage of land and water resources in agriculture (Figure 1).



Source: WIS-II, 2013

Figure 1 - Mechanisms of effective usage of water resources in agriculture

Most of the water resource comes from outside of the country. Two observation area located in Syrdarya River Basin, which has area 444 thousand square km. River flows through four neighboring republics of Central Asia: Uzbekistan, Kazakstan, Tadjikistan and Kyrgystan. The eastern part of the basin occupies a mountainous region, which has hosted the Naryn River and the Kara Darya River, where Syrdarya River forming. Numerous tributaries of the Syrdarya River also starts in the mountainous area. A large part of the population lives on the fertile mountain valleys and adjacent plains of the middle reaches of the river. And there are a number of large cities with developed industry as Tashkent, Chirchik, Andijan, Fergana. In the western part of the basin till the Aral Sea stretch of desert, and life here is concentrated only in the oases along the Syrdarya. In 1970's The Syrdarya basin was made of 50% of industrial and 42% of agricultural products, including 40% of cotton in Central Asia.

Water management system in Uzbekistan consists of 4 level (Figure 2), in which on the top located Cabinet of Ministers, Ministry of Agriculture and Water Resources and its regional structures on behalf of State authority. As a result of water reform in Uzbekistan, a hydrographic (basin) approach has been recognized in legislation and basin organizations have been set up in 2003. However, in Uzbekistan, as result of reforms in water sector, basin organizations in the form of Basin Irrigation System Authority (BISA), consisting of a Canal Management Organization (CMO) and Irrigation System Authority (ISA) have been established. BISA serves as a territorial body of the Central Water Management Administration responsible for a unified policy in water resources regulation and use in a basin. In Uzbekistan, out of 10 BISAs created in 2003 (to replace 12 administrative organizations at provincial level).



Source: Duxovniy, 2015

Figure 2 - Water resource management system in Uzbekistan.

BISAs consist mainly of ISAs and Provincial Hydrogeological expeditions. In addition, there are Pumping Stations departments, and Canal (systems) Management Organizations (CMO). The Main Canal Management Organization is a subdivision of BISA and is responsible for implementation of technical policy along the respective canal system. The ISA is a unit of BISA responsible for management and use of water resources in the appropriate irrigation system and also directly deals with the water users, and WUAs.

According to Kobia (2011) Water User's Association (WUA) is a group of farmers, all served by common source of water, join together to allocate all served by a common source of water. The aim of establishment WUA was to develop a participatory irrigation management concept for increasing water use efficiency through the involvement of stakeholders as much as possible in the various management activities. WUA allows farmers to perform activities that are more difficult or impossible to do individually. The creation of WUA is justified by the participatory approach in water management to allow farmers to efficiently concentrate their efforts and means for joint actions aimed at optimum utilization of water resources on irrigated and reclaimed lands. The purpose of involving WUA in improving water resource management is not only to increase water supply of irrigation water to farmers' fields but also improve the quality of irrigation management practiced by farmers. Physical improvement when accompanied by improved irrigation management lead to improved irrigation efficiency, farming practice changes and increased economic benefit.

Most of the water resource comes from outside of the country. 2 observation area located in Syrdarya River Basin, which has area 444 thousand square km. River flows through four neighboring republics of Central Asia: Uzbekistan, Kazakstan,Irrigated agriculture remains one of the most important sectors of the Uzbek economy, contributing to 19% of the country's GDP and, most importantly, providing almost 40% of the rural population with employment (World Bank, 2013). Uzbekistan is considered one of the oldest regions in the world that practices irrigated agriculture. According

to research conducted by nationally famous historians and archaeologists, construction of canals in the country began as early as the middle of the 2nd millennium BC (Bartold, 1965). Today the country uses 88% (2012) of water for agriculture. There are major rivers called Amudarya and Syrdarya as a main source for the country. The impact of climate change is expected to aggravate the situation, resulting in reduced snow and glacial reserves in the mountains – virtually the only source of water for most of the irrigated croplands throughout Central Asia (Hagg et al., 2007; Aleksandrova et al., 2014) So due to climate change the amount of water is not enough. The other fact is, Water user associations have a greater role on water use efficiency because they are last managers and final delivers of water to users (farmers).

About 80% of Uzbekistan's water supplies come from neighboring countries, primarily via the Rivers Amu Darya and Syr Darya. (Mirzaev, 1996) Climate change is expected to aggravate water availability in the country through reduced snow and glacial reserves in the mountains – virtually the only source of water for most of the irrigated croplands throughout Central Asia (Hagg et al., 2007; Aleksandrova et al., 2014) In 2011, about 20% of water in the main canals and 35% of water in secondary and tertiary canals (WUA level) is lost, mainly due to poorly functioning irrigation facilities. (Hamidov et al., 2015).

Problem of outdated irrigation canals has become a serious issue in the region, particularly in Uzbekistan is mentioned by Hamidov (2015). In his paper, Hamidov (2011) stated the poor infrastructure has an impact on productivity, timely allocation of water to users ability and willingness to pay for irrigation service fee, and thus contribute to WUA income. This in turn renders WUA's inability to maintain the infrastructure and leave them as weak organization with lack of effective rules and regulations.

Problem statement. Uzbekistan is dependent on water resources comes from outside of the country. In this situation water amount is limited, because the main resources of water comes from two major rivers Amudarya and Syrdarya, where besides Uzbekistan, neighboring Central Asian countries as Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan are also the users of these water resources. Due to highest amount of irrigated lands and population in the region demand for water resources is higher than others. Another reason the country is located at the downstream of two rivers, in which last consumer of water resources. These situation optimistically notes that there is a high demand for rational usage of water resources inside the country. In these case, water management system in WUA level is the key point to improve the critical issues with water resources, in which this level is the last distributor of water resources. Based on previous studies (Abdullaev, Dukhovniy, Hamidov, Sultanov) the most of water lose appeared in this level. That's why water management in this level plays important role in decreasing waste of water resources on delivery.

Materials and methods. For the research (a) field survey with questionnaire prepared, (b) qualitative and quantitative (statistic) analysis used as a methods. 3 provinces were selected in Uzbekistan as case study area. 10 WUA's were selected in each area. Aichi canal in Aichi prefecture of Japan was studied as a modern irrigation system. Field survey was conducted on August 2015 in Japan and in Uzbekistan on September-October 2015. Throughout the data-gathering phase of this study, author carried out face to face meeting and data collection by questionnaire. Main tasks is of the study: to analyze the current water use situation at the WUA level based on data and information obtained through the

field survey and to propose the measures to improve the water resource management system.

Study area in Uzbekistan. Kashkadarya Province (Uzbek: Qashqadaryo viloyati) established in 1924 which is located in the south-eastern part of the country in the basin of the Qashqadaryo River and on the western slopes of the Pamir-Alay mountains. It borders with neighboring countries like Tadjikistan and Turkmenistan, and also Samarkand, Bukhara and Surkhandarya provinces of Uzbekistan. The area is about 28400 km². The population is estimated to be around 2.4 million in 2005 (stat.uz), and 57% of people live in rural areas. The province centre is Karshi city (177000 inhabitants in 2005). Other major towns include Beshkent, Chirakchi, Guzar, Kitab, Koson, Mirishkor, Muborak, Kamashi, Shahrisabz, Shurbazar, and Yakkabog.

Main Natural resources include significant petroleum and natural gas reserves, with the Mubarak Oil and Gas Processing Plant as the region's largest industry. Other industry includes wool processing, textiles, light industry, food processing and construction materials. Major agricultural activities include cotton, wheat, various crops and livestock. The irrigation source of water are Kashkadrya and Amudarya rivers which plays important role in agriculture of the province. The largest water reservoir called Tollimarjon which collect water from Amudarya with pumping stations.

Tashkent Province (Uzbek:Toshkent viloyati) established in 1938, and located in the northeastern part of the country, between the Syrdarya River and the Tien Shan Mountains. It is bordered with countries like Kyrgyzstan,Tajikistan and Sirdaryo and Namangan provinces of Uzbekistan. The area is about 15300 km² with population around 4.5 million people in 2012 (stat.uz). There are Uzbeks, Kazaks, Tadjiks, Tatars, Koreans, Russians and other nationalities living in province.

Province has 15 administrative districts. The centre is Tashkent city which is about 2.3 inhabitants in 2012 (stat. uz) and it is also the capital of the country. Transportation infrastructure, with over 360 km of railways and 3771 km of surfaced roads. Tashkent has a large international airport, which is the main air gateway to the country.

Other major cities are Angren, Omlaliq, Ohangaron, Bekobod, Gazalkent, Keles, Yangiyul, Yangiobod, Nurafshon, Parkent. The climate of the province is continental climate with mild wet winters and hot dry summers. Natural resources include copper, brown coal, molybdenum, zinc, gold, silver, rare earths, natural gas, petroleum, sulfur, table salt, limestone, and granite.

Province is the most economically developed in the country. Industry includes energy production, mining, metallurgy, fertilizers, chemicals, electronics, textiles, food processing and footwear. There are some big companies such as JS company "Olmaliq mining combinatory", "Uzmetkombinat", JSC "Maksam Chirchik", JSC "Ammofos Maksam", JSC "Ohangaronsement", JSC"Uzbekkumir", JSC"Ohangaronshifer".

The main Agricultural crops are vegetables, fruits, cotton, wheat, melons and gourds and livestock. Province produced 10.1 thousand tons meat, 36.8 thousand tons milk, 71.4 million eggs, 239.7 thousand tons cotton, 631.1 thousand tons wheat, 138.8 thousand tons potato, 777.4 thousand tons vegetables, 109.9 thousand tons fruits in 2011 (stat.uz).

Sirdarya Region (Uzbek: Sirdaryo viloyati) is established 1963 and located in the center of the country on the left bank of Syrdarya River. It borders with countries like Kazakhstan, Tajikistan, and provinces Tashkent and Jizzakh. It covers an area of 4300 km², and is mostly desert, with the starving steppe taking up a significant part of the region's area. The population is estimated to be around 700 thousand people 2011 (stat.uz). Agriculture plays important role in regional economy of the province. Main agricultural crops are cotton, grain, silk, vegetables and horticulture, poultry and livestock. Province has one of the largest hydroelectric power plants, which is one third of the country's electricity. Other industries are represented by construction materials and irrigation equipment.

Study area in Japan. Aichi water canal was chosen for current research. This canal gives water for 3 Land improvement districts which distribute water for agriculture, industry and communal usage. Aichi Prefecture is located roughly in the center of the Japanese archipelago and is bordered by Mie, Gifu, Nagano, and Shizuoka Prefectures. Aichi faces the Pacific Ocean to the south, bordered by the Ise and Mikawa coastlines. Located in the western part of the prefecture is the Nobi Plain-the second-largest plain in Japanwhich was created by the Kiso River. The plain is bordered on the east by the Owari Hills, which extend southward where they form the Chita Peninsula. The Yahagi River flows through the center of Aichi, from the Mikawa Mountains to the Okazaki Plain, which was formed by the river. In the east the Toyohashi Plain was formed by the flow of the Toyo River, running from the Shitara, Yana, and Yumihari Mountains. The Atsumi Peninsula is an extension of the Toyohashi Plain. The climate of Aichi is influenced by the Kuroshio Current, a Pacific Ocean current, and is generally mild as a result. The average annual rainfall in the mountainous part of Aichi is relatively high compared to that of the plains and peninsular regions. Aichi canal is first large scale development project in Japan on agricultural development after World War II which cost US\$ 7.0 million.

- The Aichi Project for consists of:
- a) Irrigation component;
- b) Drinking water supply component;
- c) Industrial water supply component;
- d) Hydroelectric power component.

Aichi Prefecture began supplying big amount of water for agriculture and industrial use in 1961 when Aichi canal constructed. Currently, the 35 municipalities within the prefecture are divided into 4 districts, each receiving its water from dams constructed on the Kiso River, Yahagi River and Toyogawa River.

Results and discussion. It was noted that among 30 respondents 46.6 percent managers have university or high education degree. Most of them are graduated from Agricultural schools. It helps them to work on agriculture. The only manager has finished vocational school degree. More interesting fact is all respondents are male. The longest period for respondents who has been managing the Association is 10 years. Some of them started their work from last year.

Table 1

Respondents age distribution		Respondents education level		n level
A go lovel	Respondents	University	Professional	Vocational
Age level	number	degree	college degree	school degree
30-39	8	5	3	
40-49	9	2	7	
50-59	12	б	5	1
60-69	1	1		
	Respondents a Age level 30-39 40-49 50-59 60-69	Respondents age distribution Age level Respondents number 30-39 8 40-49 9 50-59 12 60-69 1	Respondents age distribution Respondents University aumber University degree 30-39 8 5 40-49 9 2 50-59 12 6 60-69 1 1	Respondents age distribution Respondents education Age level Respondents number University degree Professional 30-39 8 5 3 40-49 9 2 7 50-59 12 6 5 60-69 1 1 1

n=30 Source: Authors field survey, September - October 2015

Figure 3 demonstrates about current irrigation network



Source: Authors field survey, September - October 2015 Figure 3 - The structure of irrigation network, in percent.

Financial statement of WUA was analyzed based on a response of section "Finance" of the questionnaire from 28 WUA out of 30, in which two of all sample WUA did not wish to respond financial aspects of their activities. According to the results, average revenue per one WUA is amounted about 106.5 mln. sums and its main source is member's fee, which is an average 92.9% of all income. Members fees are differ from WUA to WUA, depending on size of lands, farmers, main activities and types of crops. As the main source of income of WUA is member's fee, it's collection is the main problem for WUA, which is main condition of contracts between WUA and members. This problem caused by certain obstacles, which many farmers in this WCA have not received payments from the state for their previous years products and it usually takes up to one year to receive full payments. Another reason is that this payment is less in priority compared to other mandatory payments such as fertilizer, fuels, credits from banks or leasing contracts. Partially, it is also subsidized by state budget at an average 6.1% of all revenues.



Source: Authors field survey, September - October 2015

Figure 4 -Structure of revenue, as a percent to all revenues

Subsidy from government is provided mostly for the priority crops, such as cotton and wheat. The other sources consist of financial and technical assistance to certain WUA, covered by special international or domestic projects. Practical interest observed in structure of revenue in selected areas, which demonstrates significant difference (figure 4).

Contracted budget per one WUA is amounted in average 69 mln.sums in Area 1, 119.7 mln. sums in Area 2 and 129.3 mln.sums in Area 3, while actual budget reached to 55.4 mln., 98.9 mln. and 104.3 mln. sums respectively. Only four WUA's actual budget exceeds the contracted budget, which are due to government subsidy and other sources.

The share of fee collection vary from 28% to 99%, only in one WUA in sample achieved more than 100 percent fee collection from members. Area 1s' revenue is diverse with existence of other source of income besides member's fee and subsidy, and share of government subsidy is twofold more than Area 2 and Area 3. WUA as a nonprofit organization its budget should be distributed in accordance with improvement of its efficiency without earning any profit. Budget of WUA is directed in four main groups of expenditure, in which salary fund for employees gets almost half of the budget. The second significant expenditure is maintenance and repair cost of equipment, owned by WUA is about 35.4% of all expenditures Share of salary vary between at least 30% to at most 73%, while maintenance and repair cost varies between 18 and 55 percent respectively. Average expenditure per one WUA is amounted about 106.5 mln. sums.



Source: Authors field survey, September - October 2015

Figure 5 - Structure of expenditure, as a percent to all revenues.

Provincial structure of expenditure differs significantly. Area 1 pays more than half (56.6%) of its budget to salary, which is compared to rest of areas more than at least 10% points (figure 5). However, amount of resources directed to improve assets and equipment need to be sufficiently balanced, which is comparatively lower than other areas.

Average expenditure per WUA between areas differs significantly, where Area 1 spends about 55.4 mln sums, Area 298.9 mln. sums and Area 3 the most 104.3 mln sums. These gaps between areas can be explained by the number of farmers and size of irrigated lands.

As a conclusion, there is an obvious lack of execution of contracts, which is insufficient collection of member's fee. Allocation of resources in proper way directs WUA to manage efficiently and distribute fairly of water resources among the water users. This requires establishing a position of economist in WUA and to purchase modern technologies to manage water resources efficiently.



Source: Authors field survey, September - October 2015

Figure 6 - Water delivery and lost.

The results of analysis indicated that water loss on delivery are different in each area. Average lost is 33.05 %. According to Hamidov et al., mainly because of poorly functioning irrigation facilities WUA lose 35 % of water. And 13 WUA out 30 feel water shortage. Water loss (L) is identified as difference of received volume of water from main canals (R) and delivered volume of water in fact (D) in percent to total received volume of water (R) (as a formula: R-D=L/R*100)

9

Aichi canal project. The Aichi Canal Project is one of the large scale project which proposal by local farmer and high school teacher (Mr. Kuno and Mr.Hamajima). Project finished in 1961. It took 4 years only. The project to provide water agricultural water, industrial water, domestic water for Aichi prefecture.

Goal of the project was:

- to increase food production and the improvement of agriculture of region

- to increase of population standard of living of region

- to develop industrial sector of region

- producing energy by construction of a new power plants (Yoshio Hayakawa , Hiroshi Izume)

Due to economic growth of the region, industrialization and urbanization the demand for water increased, and the canal capacity became evident. Because of time is passes canal body damaged, eroded and sedimentation happened. Then Aichi Canal Second Phase Project started in 1983 and finished 2004.

Advantages of the project were as follows:

1. Reconstruction of the canal segments. (double-way flumes)

2. Construction of regulating reservoirs.

3. Reconstruction of lateral canals into pipelines.

4. Introduction of distant monitoring and controlling and modernization of management facilities. (Hiroshi Izume at all).

New reconstruction of the main canals into double-way flumes helps to easy maintenance. Regular maintenance such as cleaning inside the waterways, removal of sediment from the waterways can be done while water is running through either way of the flume.

Construction of regulating reservoirs goal is storing and using the unused water that flows down to main canal. When the arrival water volume is low It helps to provide a stable supply for water downstream and effective use of water resources.

Reconstruction of lateral canals into pipelines provide water to fields in short time. It also helps stable supply of water for agriculture. Due to reducing unused water, nonarriving water volume, and management water will use effectively (no waste water). Reduce of time and labor on distribution.

Introduction of distant monitoring and controlling helps for on time information about volume of water, effective use of water resources (highly accurate water distribution implementation), supplementation for flow volume change. The system is introduced to the main canal, which was mostly open channel of about 112 km in length with 152 points of division. Due to modernization of management facilities the operations and maintenance workforce reduced from 87 staff (1961) members to only 39.

Water managements systems differs from country to country. These differences are due to geographical location of countries, climate, level of development, human resource capacities and level of information technology. However author intended to compare water management system in Uzbekistan and Japan.

Conclusion. Based on our results water shortage happening in study area (3 provinces). Thirteen WUA out of thirty feel water shortage. Main cause is water loss. Water loss happening mainly because of poorly functioning irrigation facilities WUA and main part (64.6%) of canal is based on earth type.

The next is lack of modern measuring and monitoring

tools getting on-time information about water amount. WUA staff use traditional techniques for getting data. WUA staff needs to check the water level of water facilities such as water intakes frequently to stabilize water amount.

WUA wishes: to get money on time for service to have constant front of work for machinery, to own money for duly repair of reclamation machinery, petroleum products and salary as well.

After observation of advanced irrigation system in Japan we recommend some application as an idea which might be helpful to improve Water resource management of Uzbekistan by level of WUA:

Potential applications: a)buffering system (pons, small reservoirs). Construction of regulating reservoirs, ponds goal is storing and using efficiently the water that becomes unused when there is sufficient water. When the arrival water volume is low, the system helps to provide a stable supply to downstream and effective use of water resources.

b)Distant monitoring and controlling (Measurement system). Introduction of comprehensive, distant monitoring and controlling system helps on- time information about the volume of water, effective use of water resources (highly accurate water distribution implementation), supplementation for flow volume change.

c)doubling canal. New reconstruction of the main canals into double-way flumes enables to easy maintenance. Regular maintenance such as cleaning inside the waterways, removal of sediment from the waterways can be done while water is running through either way of the flume.

d)construction of lateral canals into pipelines. The application provides water to fields in a short time. It also contribute to stable supply of water for agriculture. By reducing unused water, non-arriving water volume, and management water will lead to an effective water use (no waste water). Reduction of time and labor work on distribution is also expected.

Acknowledgements. We would love to express our thankfulness to the Government of Japan and Uzbekistan, Embassy of Japan in Uzbekistan and Embassy of Uzbekistan in Japan, JICA (Japan International Cooperation Agency), JICE (Japan International Cooperation Center) headquarter and Uzbekistan office, JDS (Japanese Grant Aid for Human Resource Development Scholarship) Project committee, Tokyo University of Agriculture and Technology, National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" (NRU TIIAME) that supported for research.

References:

1. Abdullaev I, Ch.Fraiture, M. Giordano, M.Yakubov, A. Rasulov. Agricultural Water Use and Trade in Uzbekistan: Situation and Potential Impacts of Market Liberalization. Water Resources Development, Vol. 25, No. 1, 47–63, March 2009

2. AbdullaevI., Kazbekov J., Manthritilake H. & Jumaboev K. (2010). Water user groups in Central Asia: Emerging form of collective action in irrigation water management. Water Resources Management 24(5): pp.1029–1043.

3.Aleksandrova M., Lamers J., Martius C., Tischbein B., 2014. Rural vulnerability to environmental change in the irrigated lowlands of Central Asia and options for policy-makers: a review. Environ. Sci. Policy 41, 77–88.

4.Dukhovny V., Sokolov V., Ziganshina D. Integrated Water Resources Management in Central Asia, as a way of survival in conditions of water scarcity. Quaternary International (2013) 181-188

5.Hagg, W., Braun, L.N., Kuhn, M., Nesgaard, T.I., 2007. Modelling of hydrological response to climate change in glacierized Central Asian catchments. J. Hydrol. 332 (1–2) 40–53.

6.Hamidov A., Thiel A., Zikos D. Institutional design in transformation: A comparative study of local irrigation governance in Uzbekistan. Environmental science & policy 53 (2015) 175 – 191.

7.Hamidov A., Thiel A. Institutional change in transition: Review of conditions for sustainable water consumers associations in semi-arid Uzbekistan. 2011. (IASC) European Meeting materials.

8. Hiroshi Izume, Masaharu Okada, Yoshio Hayakawa, Yasuro Nakajo. Aichi canal evolved to meet the needs of water users. The history and idea of the Aichi canal second phase project.

9.Khan, M. A. (1996) Extension and Training (Rome: Food and Agriculture Organization of the United Nations)

10.Kobia Kimathi George. Community based water management: practical lesson from Timau WUA. 2011. Lap Lambert Academic Publishing

11.Mirzaev, S. Sh. (1996) Problems of Aral Sea: causes and solutions, in: Proceedings of Conference on Aral Sea Problem, pp. 21–32 (Tashkent: Institute of Irrigation and Melioration).

12.Sultanov A., Umurzakov U., Rashidov J. Water resource economy and management. book in uzbek language, 2008, Tashkent, Uzbekistan 13.Umurzakov U, Toshboev A, Rashidov J. Economy and management of Agriculture. book in uzbek language, 2008, Tashkent, Uzbekistan 14.Yalcin, R. and Mollinga, P. (2007). Water users associations in Uzbekistan: The introduction of a new institutional arrangement for local water management. Amu darya case study – Uzbekistan, Deliverable WP 1.2.10 of the NeWater Project, Centre for Development Research, University of Bonn.

15.Yashuro Nakacho.(2011)The Aichi canal project 50 years of operation and improvement. CIRG International Symposium materials. 16.Welfare Improvement Strategy of the Republic of Uzbekistan for 2013-2015, Tashkent -2013.

METHODOLOGICAL ASPECTS OF THE DEVELOPMENT OF AGRICULTURAL RECLAMATION

B.Sultanov, Head of the Department of Economics, NRU "TIIAME", Doctor of Economics, Senior Researcher

Abstract

This article gives information about methodology related to agricultural reclamation, the formation, and concept of agricultural reclamation, scientific approaches of researchers concern-ing land reclamation, etc. In addition, water problems, using resourcesaving technologies, regional aspects of improving the efficiency of water resources use, developing infrastructures in the water management system of the republic, and improving the efficiency of water management by the state are presented in this paper. Keywords: aagricultural reclamation, crop rotation, irrigation methods, agricultural technologies, land reclamation.

Introduction. Land reclamation-related initial views, ideas, and actions have a long history in Central Asia. Indeed, according to historical sources, they have traveled a long historical path of 6 thousand of years from the first simple ideas to the most complex teachings. It should be said that these simple ideas formed the basis for the creation of complex teachings. Even in the most ancient sacred books, the culture of land use and water use, economic, legal, social, and even environmental aspects of their use are shown in detail.

In particular, "Avesta", the holy book of the Zoroastrian religion, pays special attention to the issues of agriculture based on artificial irrigation, respect for mother nature, and improvement of soil conditions. "Irrigation of lands and crops, drainage of wastelands - ideas about land reclamation indicate that one of the four vital elements soil, water, fire, and light - is extremely important for the conditions of that land" [1].

Islamic jurisprudence also pays great attention to issues of property and property relations. In particular, tax relations were clearly defined when using land, and in the 7th century, a differentiated taxation system was introduced in the amount of 25, 33, and even 50 percent of the crop, which was taken from a unit of land area, depending on its quality and irrigation methods [1].

Literature review. It can also be noted that special attention is paid to the rational use of thousands of discoveries and developments created by our ancestors and recognized by the world community. In this regard, the economist, prof. It is described in detail in the scientific work of A. Razzokov "Economic turmoil". In particular, the construction by our compatriot Ahmed al-Fargani of a structure that measures the water level and flows in the Nile River, the introduction in our region of the cottonalfalfa-grain crop rotation method, irrigation canals, used rivers, canals, and even wells from underground to the surface to still in use in the US, widespread use in India and Pakistan, public water use arrangements, Ahmed Donish's development of the first Amu Bukhara canal project, many examples could be cited. However, they are not put into circulation as scientific theories and laws for objective and subjective reasons.

The first scientific and methodological approaches to the concept of land reclamation as a whole were formed in the 17th century, and initially, it was called "reclamation", from the beginning of the 19th century. it was called "landscaping". At present, generalizing the meaning of the term melioration, it is considered an approach to improving the condition of land plots in a mutually balanced way between society and nature, based on the interests and needs of man.

In this regard, the joint balanced action of society and nature has an undeniable classification, which requires them to be purposeful in all respects and to know the laws of nature, the principles of their operation, and to strictly observe them. Failure to observe such principles, which are the basic condition and requirement of joint action, will naturally lead to the worst and most dangerous consequences. For this reason, representatives of classical economic science have seriously paid special attention to this mentioned issue.

The use of non-scientific agricultural technologies in the cultivation of agricultural products caused irreparable damage to the upper layers of the soil, the development of the desert territories of Kazakhstan and Uzbekistan during the former USSR (in the 50s of the last century), the development of a difficult environmental and economic situation, land degradation, water and wind erosion From history know what caused it. Also, as a vivid and irrefutable example of such situations, one can cite the major environmental crises that occurred in the 1930s-1970s as a result of the use of irrational tillage technologies in US agriculture. It should be noted that as a result of it, large-scale erosion processes occurred, as a result of large sandstorms, highly fertile soil layers were destroyed on tens of millions of hectares of land.

Among such failed projects, it is necessary to name the island's destruction and ecological disasters that occurred in coastal areas due to the development of lands around the upper and middle reaches of the Syr Darya and Amu Darya and the formation of irrigated agriculture.

Materials and Methods. In general, based on the research results of representatives of a number of scientific schools, the development concept of agricultural melioration can be systematically systematized in the following order and sequential directions (Table 1).

Discussion and results. The ideas of interdependence between man and nature related to the development of land reclamation were embodied in the research of classic naturalist scientists and scientific figures of the XIX-XX centuries (N.I. Vavilov, V.V. Dokuchaev, I.V. Michurin, etc.) and were advanced compared to their time. it is distinguished by the fact that the idea was pushed, was recognized by the world, and has not lost its value even today.

Table 1.
Formation and directions of development of
agricultural melioration

science of land reclamation. However, until that time, land reclamation was considered a practical part of the science of "Agricultural hydraulic engineering". The scientist conducted land reclamation research and experiments in

Conceptual (school)	Causes of the theory (school).	
directions		Summary
Naturalists (representatives	The formation of the theory of natural	The emergence of this theory has
of the Russian classical	formations, provided the emergence of the	created a need for a comprehensive
school)	science of the landscape.	study of natural systems.
XIX-XX centuries.	-	
The school of Soviet	Formation of different ideas about soil	The theory of the melioration of saline
scientists was formed in the	science as a medical object.	soils was formed mainly in the field of
30-40s of the 20th century.	-	soil science. A large database of soil
		systems and properties has been
		collected.
Including, Scientists of the	Adapted technical means, technologies, and	A theory of irrigation has been formed,
All-Union hydro-technical	geoecological restrictions have not been	which provides for the optimization of
and reclamation and research	formed, and the influence of irrigation	irrigation methods, taking into account
institutions of the Union	methods on the development of the	the level of water absorption in the soil.
republics.	reclamation system has not been studied.	_
Modern supply concept	The level of degradation of the natural	It was recognized that the only way out
From the 90s of the 20th	environment and the agroecosystem is	of this situation is to focus technical and
century to the present	recognized as aggravating. As a result, there	technological development on solving
	was a need to improve the ways of linking the	environmental problems. On this basis,
	requirements of the natural environment with	the theory of the "landscape system of
	economic activity.	agriculture" was formed.

The uniqueness of the scientific research carried out by them is that they are characterized by the interpretation of nature in time and space, as a natural single and general being.

However, it should be noted that the main motto of land reclamation for many years to this day is the opinion of M. V. Michurin that "one cannot expect favors from nature". Because the current ecological situation and approaches to land use processes lead to an aggravation of the conflict between nature and man.

V. Dokuchaev, the founder of the science of soil science and melioration in Russia, who laid the foundation for the creation of the theory of landscapes and the founder of the idea of natural areas, paid special attention to this approach. His theory is based on the idea of a comprehensive study of natural systems based on the system of organization of agriculture (optimization of natural systems (landscapes)). In his work "Our Deserts - Yesterday and Today", he recommends a system of measures to prevent and combat such threats in the future, based on the experience of combating coastal erosion. In his opinion, such activities "should be in a certain sequence and strictly systematized, like nature itself" [2]. Also, this scientific work includes complex measures against coastal erosion, in particular: hydrotechnical, anti-erosion, thermal and wind reclamation, plant and agro-reclamation, river reclamation, agro-reclamation, and agrotechnical measures.

In the 30s and 40s of the 20th century, scientific views (representations) related to the soil as an object of reclamation, due to objective reasons, did not receive regular development. The reclamation system emphasized that soil science is the theoretical basis for the reclamation of saline lands and for solving the problems of reclamation of irrigated lands. In the early 1950s, in connection with the intensive development of land reclamation, many databases were created on the soil regime and its properties in wet landscapes. At the same time, reclamation is noted as the main factor in the intensive development of agriculture, and its negative consequences are also studied.

It should be noted that Academician A. N. Kostyakov made a significant contribution to the development of land reclamation science. This scientist was the first to develop and improve the scientific foundations of the the republics of Central Asia, the Caucasus, and the Volga region. A. Kostyakov introduced into science the concept of a hydro module, a method for calculating the irrigation regime for agricultural crops based on the water balance, an irrigation system, a method for calculating drainage and salt flushing, and irrigation theories were created.

A great contribution to the development of the science of land reclamation was made by scientists from the Russian Research Institute of Hydraulic Engineering and

Land Reclamation and the Moscow University of Natural Improvement. They were among the first to develop a conceptual model for managing reclamation systems.

A new stage in the development of agricultural production began in our country in the 60-70s of the last century due to land reclamation. One of the main reasons for this is that the former Union government (March 1965 Plenum) outlined promising (for 10 years) directions of agrarian policy, which set the task of intensive development of agriculture based on three main factors, i.e.,

mechanization, chemicalization, and land reclamation. When implementing this Program, the issue of organizing the production and material and technical bases of water management organizations and special institutes, and research institutions were considered. During this period, such large research institutions as "VNIIGIM", "SANIIRI", "VolzhNIIGM", "DalNIIGiM", and regional experimental stations operated in all republics. In 1966, new special scientific centers were established. In general, by the 1970s, the activities of more than 20 scientific and practical organizations were aimed at developing the scientific foundations of land reclamation.

This situation has led to the improvement of the methodology for conducting scientific research on land reclamation. This, in turn, as noted, led to the formation of various ideas about the development of land reclamation; many scientific sources and literature are devoted to it. In particular, scientific schools have been created in Uzbekistan to improve the efficiency of agricultural reclamation measures in the agriculture of the republic. For example, K.I.Lapkin, F.K.Kayumov, J.Medetullaev, K.A.Choriev, O.P.Umurzokov, N.S.Khushmatov contributed to the improvement of the scientific-theoretical and methodological-practical foundations of this problem.

The scientific and practical aspects of land reclamation activities were first studied by K. I. Lapkin, who was one of the first in our republic in his scientific works to comprehend and substantiate irrigation and land reclamation as the main factors in the processes of specialization and settlement of agriculture in the regions. In his opinion, "... irrigation, as the main factor in the intensive development of agriculture, is the basis of its specialization. The fulfillment of plans and tasks in agriculture is directly related to the increase in production volumes, the improvement of its structural structures, and irrigation and reclamation construction work" [3]. Also, this scientist developed the scientific and theoretical foundations for the formation of the processes "Agriculture" and "Land use" as a system in Uzbekistan and is recognized as the founder of a large scientific school in this direction. Because the scientific and methodological developments aimed at solving the above problems of economists who are representatives of this scientific school have not lost their significance at the present time and are of great scientific and practical importance.

The studies and scientific works of the economist F. Kayumov are aimed at the efficient use of land and water resources, the improvement of the methodological foundations for determining the effectiveness of investments directed to the agricultural sector, and the development of commodity-money relations when using these resources. In his monographic study on improving the efficiency of networks of the agro-industrial complex in the context of the transition to market relations, it was noted that since the 50s and 60s of the last century, extensive factors have been mainly used in use. land and water resources to improve production performance, which led to the fact that the number of funds spent was higher than production performance. In his opinion, "...in these processes, a "peculiar approach" to the issue of land reclamation was formed" was set, then the processes of managing the network or the system for distributing such funds are too centralized, and the fact that it was carried out on a "top-down" basis indicates that this important issue has not been given the necessary level of attention. For example, 80-85 percent of the funds allocated for these purposes were directed to the development of new lands." [4] From this point of view, it is necessary to ensure the targeted spending of funds allocated for the improvement of land reclamation, in strict order on the principle of "bottom-up".

Economist K. Particular attention was paid to this problem in the research works of Charyev, who interpreted hydroreclamation measures as the main factor in the development of agricultural production on an intensive basis. In particular, in his opinion, "... the most important features of hydro melioration as a factor in the intensification of agricultural production: firstly, hydroreclamation measures are not considered as a technological process, its main task is to create conditions for the intensive use of land resources. and expand opportunities for creating qualitatively new landuse systems; secondly, at the moment, the failure to carry out comprehensive irrigation and reclamation measures with full consideration of such aspects as cultural and technical, protection of land resources will not give the expected economic effect; thirdly, irrigation and reclamation measures improve the real results obtained from them while simultaneously strengthening other intensive factors. In turn, the implementation of all the main directions of intensive development of agriculture in interdependence (in acceptable options) is important not only to ensure the high economic efficiency of irrigation and drainage measures, but also to ensure the intensive development of agricultural production" [5]. Scientific research conducted by one of our agrarian economists O'Umurzakov was devoted to solving the problems of rational and efficient use of the existing production potential in the agricultural sector of the economy, its methodological foundations were systematically studied.

Assessment methods have been improved to take into account changes in the quantity and quality of land and water resources, which are the main elements of this potential. In his opinion, "... one of the priority areas for developing the production potential in the agricultural sector is to improve the quality indicators of land plots, which are the main means of production in the industry. At the same time, the main attention is paid to increasing the technical potential of the irrigation and drainage system, which is considered one of the important tasks awaiting a solution. ...because a large number of funds spent for these purposes should ensure an increase in productivity and income per unit of land by increasing the productive potential of the land" [6].

The scientist-economist V.Ch-S.Kim also conducted research on the problems of improving the theoretical and methodological base for increasing the efficiency of irrigated land use in a market economy, economic evaluation of land, paid use of water resources, evaluation of the effectiveness of capital investments in agriculture, partially studied and the question of the effectiveness of land reclamation measures. In this, he supports the idea of the expediency of determining the effectiveness of land reclamation measures based on the capital investments spent for these purposes and cadastral data on land and water resources. In particular, in his opinion, "the effectiveness of the use of reclaimed lands is assessed based on the number of capital investments spent on the implementation of these activities, and the data of the land and water cadastre. During the development of capital investments over the years, the increase in crop yields should correspond to the standard payback periods for these investments" [7].

In addition, the development of irrigated agriculture in conditions of limited water resources, which is one of the urgent problems today, is recognized as one of the serious problems not only in Uzbekistan, but also in many countries of the world, and many studies are being carried out in this regard. In our republic, research on these issues was carried out by the agronomist S. Dzhalalov. The scientist's doctoral dissertation focuses on theoretical and practical solutions to the problem, regional aspects of improving the efficiency of water resources use, developing infrastructures (IIS) in the water management system of the republic, and improving the efficiency of water management by the state. According to studies, the improvement of the technology of melioration and the production of agricultural products, their specialization has an effective impact on the efficiency of the use of available natural and industrial resources. He also stated that "as a means of intensive development of reclamation agriculture, it is important to increase the volume and productivity of cultivated products, taking into account the specifics of the regions. ... The basic principles of a rational economy increase soil fertility by improving the structure of agricultural enterprises, depending on natural conditions" [8].

The agricultural economist N. Khushmatov noted that the efficient use of land resources is important in the context of the introduction of a socially oriented market economy in the agricultural sector of our republic. In this regard, today more than half of the irrigated lands in our republic are in need of repair and improvement. According to N. Khushmatov, according to the results of his research, "the reason for the secondary salinization of soils is the proximity of mineralized seepage waters to the surface of the earth. The large-scale use of irrigation water causes an increase in the level of seepage water. Salinization of newly irrigated lands occurs with the formation of difficult reclamation soils. ... in most regions, new lands are being developed with low efficiency without taking measures to improve reclamation conditions. In addition, due to the unsatisfactory condition of collector-drainage networks and the lack of irrigation water, crops are not planted on irrigated arable lands" [9].

Such unpleasant situations occurring on a global scale, especially in the early years of the 21st century, are somewhat exacerbated by new methodological approaches in this direction, the creation of methods for the rational use of natural resources, the improvement of research methods in the areas of resource and energy conservation, and the increase in soil productivity, which plays a key role in increasing the efficiency of land use, raised the issue of ensuring sustainable environmental and economic development.

As a result, by the 70s and 80s of the last century, the concepts of "alternative land use" or "adaptive landscape agriculture" were formed in the world agrosystem. According to the scientist A.L. Ivanov, who conducted scientific research in this direction, the "adaptive-landscape system of agriculture" is part of separate agroecological groups for growing economically and environmentally sound qualitative and quantitative products by restoring the stability of agro landscapes and soil fertility based on the demands of society and the market is the system of land use [10]. The main goals of this system are:

- environmentally and biologically the development of a modern system of agriculture in order to provide consumers with environmentally friendly products that are harmless to the environment;

- application of environmentally friendly agricultural production technologies based on the principles of energy and resource saving and environmental sustainability (introduction of promising irrigation methods, soil protection from water and wind erosion, etc.);

- selection and implementation of optimal ratios of interactions of structural structures in the agrosystem through the integrated use of natural, man-made, biological, and labor resources.

In general, agro landscape agriculture provides for the creation of a single agroecosystem in the organization of production based on the natural, climatic, economic, and social aspects of the intensive development of agriculture, taking into account natural resources and technogenic factors.

The current state of reclamation of irrigated agriculture shows that the adaptive landscape farming system is somewhat promising compared to other methods of eliminating the negative consequences and aspects associated with this factor. Because this method is based on ensuring a balance between the laws of the development of nature and the interests of society. On the other hand, according to V. N. Krasnoshchekov, "the main task aimed at developing an adaptive landscape system of agriculture is not to develop the degree of dependence of the agro-ecological requirements of agricultural crops on environmental factors (they have been sufficiently studied), but to connect the requirements of the natural environment, which fully ensures the sustainability of natural landscapes, with the development of methods of economic activity" [11]. N. Krasnoshchekov, "the main task aimed at developing an adaptive landscape system of agriculture is not to develop the degree of dependence of the agro-ecological requirements of agricultural crops on environmental factors (they have been sufficiently studied), but to connect the requirements of the natural environment, which fully ensures the sustainability of natural landscapes, with the development of methods of economic activity" [11].

Therefore, taking into account this interdependence, it is desirable to develop a strategy of economic, environmental, and social tasks that fully covers these connections. Such thoughts and ideas were also recognized by scientists such as K. G. Gofman, and M. Ya. Lemeshev. In particular, according to M.Ya. Lemeshev, "ecological, economic-social, technological and biological processes are closely related to each other to such an extent that modern production processes require to be considered as the activity of a complex ecological-economic system. In this case, economic and natural systems cannot be opposed to each other" [12]. In our opinion, it is appropriate to form a strategy for the development of land reclamation based on these ideas and requirements.

It should be said that under the influence of technogenic factors (new technologies, increased use of mineral fertilizers and pesticides, etc.), the yield level can be maintained for several years, and in some cases even increase. However, as a result of severe degradation of the non-reclamation areas used in this way, there is a high probability that their productivity will drop sharply and they will be out of the system of agricultural use for a long time. We believe that special attention should be paid to the opinion expressed by Academician A. N. Kostyakov. In his opinion, "reclamation is not a quick-acting tool in its content and essence, but it is not advisable to apply it late, that is after the crisis situation has begun". Because land reclamation cannot cure the natural crisis in agriculture. It protects the economy from such risks, preventing the occurrence of crises. Land reclamation not only increases productivity and income in agriculture but also smooths out fluctuations in the level of profitability... Land reclamation governs the regulation of the sustainability of agricultural activity" [13].

It is impossible to think about the methodological aspects of the development of agricultural land reclamation without strict control of degradation processes at the economic, regional, national and global levels. The determination of the need for land reclamation is based on factors such as climatic and soil conditions of the area. regions based on the need for agricultural products. One of the main measures to improve its economic efficiency is the resource approach, which involves an analysis of the number of regulatory resources required for the production of agricultural products, as well as the factors necessary to achieve a given yield and economic efficiency, namely water, electricity, mineral fertilizers, pesticides and a minimum amount of resources such as pesticides and seeds.

The transition to low-cost, resource-saving methods of agricultural production and their implementation is one of the most difficult tasks from an economic point of view. To improve the efficiency of land use, it is necessary to reduce the cost of machinery and equipment, material and energy costs, and minimize the impact on the natural environment.

The study and analysis of modern theoretical, conceptual and methodological foundations for the development of agricultural melioration allows us to draw

the following conclusions:

- despite the wide and complete coverage of the problems of using the natural resource potential of scientific research conducted in world practice, they do not fully cover the environmental, economic, and social efficiency of land reclamation;

- the lack of scientific and methodological research on environmental and economic problems adversely affects the sufficient validity of proposals and recommendations for the elimination of degradation processes, methods of reclamation, and integrated reclamation;

- it is possible to create an environmentally sustainable, economically efficient, and socially necessary system of land reclamation in this industry only with an integrated approach to the implementation of land reclamation measures in agriculture;

- a lot of information and facts are given that the world economy is gradually collapsing in several directions. Therefore, in order to maintain and develop economic development, it is necessary to gradually carry out targeted structural reforms that ensure environmental stability.

It should be noted that significant and significant progress has been made in recent years in the areas of resource development, nature protection, and land reclamation using an adaptive-landscape strategy. Such research work should be carried out with a further in-depth study, taking into account the principles of mutual unity and the relationship between natural and anthropogenic factors. Among the problems that have not been fully resolved so far, it is also necessary to include the issues of improving scientific and methodological approaches to assessing and increasing the effectiveness of land reclamation measures.

Conclusion. In this regard, in the conditions of modern intensive agriculture, it is advisable to pay attention to the improvement of the theoretical and methodological foundations for the integrated development of land reclamation activities and all its types. Because under the influence of land reclamation measures, along with the improvement of land area, profound positive changes in the composition and regime of soils are observed on a landscape scale. At the same time, the main task is not only to identify changes in these areas but also to identify and predict their negative and positive consequences. That is, the main goal and core of the modern concept of land reclamation should be a system of innovative measures implemented on the basis of an integrated approach.

The main differences between landscape reclamation are that it is aimed at improving the ecological state (ensuring the cleanliness and cleanliness of the environment), the

References:

1. Razzakov A. Confusion of economic thought. - T.:NMIU "Uzbekistan", 2011. - 248 p.

2. Dokuchaev V.V. Our steppes before and now (1892). - M. - L., 1951.

3. Lapkin K.I. Distribution and specialization of agricultural production in Uzbekistan. - T .: Publishing house "Science", - 1966, p.111.

4. Kayumov F.K. Efficiency of the agro-industrial complex in the conditions of transition to the market . - Moscow : IPO Poligran, 1992 . - p.160 .

5. Chariev K.A. Problems of arary resource potential in the conditions of transition to the market. T .: Publishing houses "Fan", 1992. – p. 48. 6. Umurzakov Yu.P. Ways to improve the efficiency of using the resource potential of the agricultural sector of the economy. dissertation abstract, doctor of economic sciences. T.: 2003.

7. Kim Vitaly Chan-Sebovich. Efficiency of the use of irrigated lands in a market economy (theory, methodology, methodology, production experiment, implementation) Tashkent. RCNTI "Uzinformagroprom". - 1992. P.14-15.

8. Dzhalalov S.Ch. Irrigated agriculture in conditions of water resources deficit. Mono-graph Tashkent. - EIK. 2000, 126 p.

9. Khushmatov N.S. "Improving land relations and increasing the efficiency of land use in agriculture". Agrarian and economic reforms in Uzbekistan: achievements, problems and ways to solve them. Tashkent. "UzBIITI", 2006. – 41-45 p.

10. Ivanov A.L. Results of scientific activity in the field of agriculture, melioration, water and forestry // Bulletin of the Russian Academy of Agricultural Sciences. - 2006. № 1. - p. 6-9.

11. Krasnoshchekov V.N. Methodological principles of sustainable development of the economic system and the role of adaptive landscape agriculture and its provision. //Reports of the Russian Academy of Agricultural Sciences. - 2006. № 2. - p.22-26.

12. Lemeshev M.Ya. Economy and ecology. - M: Knowledge, 1990. - 93 p.

13. Pulatov Z.F. Placement and specialization in irrigated agriculture of the Republic of Dagestan. // Problems of land reclamation and irrigated agriculture in the south of Russia: Sat. mater, joint field meeting of the Collegium of the Ministry of Agriculture of Russia and the

FOREIGN EXPERIENCES ON INCREASING THE EFFICIENCY OF GREENHOUSE FARMS AND OPPORTUNITIES FOR THEIR USE

A.Sh.Durmanov, PhD, associate professor, National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers"

Abstract

In this article, a comparative description of greenhouses in the leading countries and the Republic of Uzbekistan, the area of greenhouses in the leading countries and the Republic of Uzbekistan, indicators of competitiveness of vegetable products grown in greenhouses in the international market, indicators of competitiveness of countries in the international vegetable market, criteria for an integrated assessment of the level of competitiveness of vegetables grown in greenhouses in the international market, and international indicators of countries for vegetables a strategy for estimating matrix prices in the market is proposed.

Keywords : international vegetable market, greenhouse, integrated evaluation criteria, price evaluation strategy

Introduction. In recent years, the area of protected land in the world has increased by 24%. As of January 1, 2019, the area of greenhouses in the world is 497.8 thousand hectares. 90% of this area is provided with plastic greenhouses and 10% with glass greenhouses. According to experts, the area of greenhouses will increase by 11% per year and will reach 750,000 hectares by 2021.

It should be noted that Europe is considered the leader in the field of greenhouses and has 210,000 hectares of greenhouses (42.2%). In Asia - 180.5 thousand (36.3), Africa - 45.3 thousand (9.1), North America - 31.8 thousand (6.4), Middle East - 14.6 thousand ha (2.9%), South America - 14 thousand ha (2.8%) and Oceania - 1.6 thousand ha (0.3%) of the land area have greenhouses [1].

International experience shows that 70% of grown vegetables are sold fresh, 5-10% are sent for processing, and 20-25% are wasted or fed to livestock. However, the proportion of packaged and bulk vegetables varies from country to country. For example, about 85% of packaged vegetables are sold in Germany, 55% in England, 45% in Australia and 25% in Russia. In countries such as Mexico, Brazil, India and China, this figure is less than 2 percent [2].

Also, due to the development of the greenhouse industry, there is a tendency to increase the volume of production. This was achieved due to the introduction of intensive technologies, the expansion of methods of growing plants in greenhouses, new designs, eco-technologies, and the use of energy-saving technologies. Wide introduction of new developments and technologies in the cultivation of vegetable products in greenhouses is aimed at rational use and saving of available resources. This, in turn, leads to a decrease in production costs, including a decrease in the cost of products.

Materials and methods. The main goal of the article is to analyze foreign experiences and opportunities to use them to improve the efficiency of greenhouse farms. In order to achieve the goal, the following tasks were set. Including: a comparative description of greenhouses in the leading countries and the Republic of Uzbekistan, the area of greenhouses in the leading countries and the Republic of Uzbekistan, indicators of competitiveness of vegetable products grown in greenhouses in the international market, indicators of competitiveness of countries in the international vegetable market, criteria for an integrated assessment of the level of competitiveness of vegetables grown in greenhouses in the international market, and international indicators of countries for vegetables a strategy for estimating matrix prices in the market is proposed.

Results, analysis and discussion. Israel's innovation, including full control of many technological parameters in greenhouses, allows for maximum use of space and optimal distribution of production during the agricultural season. As a result, farmers get 300 tons of tomatoes per hectare in one season, which is four times more than in open fields (Table 1).

Country	Advantages	Resource saving technologies	Technologies used	State support
China	The largest number of greenhouses (80% of the global area). The first place in the world for the production of mushrooms in the greenhouse	Placement of greenhouses in the southwestern part of the country	Intensive land use	Granting subsidies to the agricultural sector in the amount of 8.5% of the value of the products produced
Netherlands	One of the leading places in the world in terms of protected land area and the number of greenhouse products per 1 berson	High utilization of graenhouse areas throughout the year regardless of weather conditions	Specialization of farms on a limited number of cheap products, the presence of a large number of groenhouses, and they are harvested several times a year. Labor productivity " re - grouping " is extract out in the field of trucks based on high and seconomic efficiency	A long term loan program for farmors with an interest rate of 1.5-2.5% for a period of up to 25 years
Japan	Leading vegetable consumption per capita (large domestic market)	Vinyl film (saving 20% heat consumption compared to polyothylone coating used in Europe); use of renewable energy sources (geothermal waters and sunlight); the use of multi-layer coatings for the greenhouse (25-45% savings), heat pumpe, air conditioners, heating in cold and coating m hot, using auromated control over microclimate parameters	Solid acrylic coalings, service life 7 years. Special plant factories: small (60 80 m ?), fully automated hydropotic stations equipped with year- round artificial lighting, computer control, and rotary conveyor systems for adjustment. This system does not depend on weather conditions, the time for planting crops is 2-4 times less, the yield is 21 times higher than in open	The construction of geenhouses is supported by the state Pays 83% of agricultural production to support consumer prices

№4(16).2022 Journal of "Sustainable Agriculture"

Table 1.

Israel	Climatic conditions, diverse topographical and elimatic conditions	Chimate control systems and low volume artificial substa at For example, low- volume technology allows obtaming 500 tens of tomatces per I heatare, the average yield in a greenhouse is 200- 300 (may per 1 heatare, and in the epen field 80 eper 1 has a A modern greenhouse allows full control of many technological parameters, as well as maximum tuso of areas and optimal dawthouten of tapp preduction during the	ground, the products are of higher quality than vegetables grown in its datasets than vegetables grown in its datasets arms season Dap migaton alleets the growth of plants the growth of plants through phomeynthesis, film, special fly nets that work during the adjustment of the light spectrum and ventilation and reduce the need for chemical treatment in response to sunhght, heat protection seriors and walight intensity. As a result, production will increase significantly. Farmers get 300 tons of formacros per hectare in one season, which is four times more than open	If a greenhouse equipped with modern technologies is built, the farmer, whean price is half a million dollars, will receive componsation from the national budget in the amount of 30% of the settlement, or pay 30% of the construction.
Uzbekistm	Climatic conditions, the area of land intended for agriculture is large	Placement of greenhouses m favorable climatic conditiona. Water saving technology	Measures adopted by the state to increase the area of intensive gardens and generalouses using modern resource saving technologies, including drip and spmikker imgation	An advance amount of not less than 20 percent of the value of the leased object is paid to the leased. Interest rates up to 7 years 4 5- 5.5% in US dollars, 9-10% in source, Exempt from VAT, customs and other mandatory fees

According to experts, today the Netherlands is a technological leader in growing vegetables in greenhouses. This country has been and remains a world leader in the introduction and use of greenhouse technologies. China has the largest greenhouse economy among other countries and Japan has the largest domestic market, which increases the demand for greenhouse products and thus develops it. Another important detail is that greenhouses in leading countries are strongly supported by the state.

As for Uzbekistan, it has a good climate, but in terms of technology it is far behind the world leaders. According to previous estimates, much attention is paid to water- and energy-saving technologies, which significantly reduce the cost of production and reduce the cost of production even below the national level. In addition, the greenhouse industry is now developing with state support.

In particular, in order to develop this industry in our country, the Decree of the President of the Republic of Uzbekistan dated March 20, 2019 "On measures to further develop horticulture and greenhouses in the Republic of Uzbekistan" was adopted. Based on this decree, the Agency for Horticulture and Greenhouse Development was established under the Ministry of Agriculture of the Republic of Uzbekistan. The agency established a non-legal entity horticulture and greenhouse development fund. Its funds are used to implement complex target programs aimed at the sustainable development of horticulture and greenhouses. At the same time, state support for newly established gardens and greenhouses that have introduced water-saving irrigation technologies based on drip and sprinkler irrigation is provided in the form of subsidies from the Fund and the state budget [3].

Also, the State Fund for Entrepreneurship Development under the Cabinet of Ministers of the Republic of Uzbekistan provides guarantees for the establishment of intensive gardens and greenhouses up to 50%, taking into account the amount of loans received from commercial banks, not exceeding 5 billion soums.

At a time when the whole world is moving from open field farming to greenhouse farming, new technologies are entering greenhouses in Uzbekistan. This will help the rapid development of this industry. Investments in the construction of new energy-efficient greenhouses are attracted to this by private investors as an effective way of profiting.

Although the area of protected land in developed countries is much higher than in the territory of Uzbekistan, the republic is among the top ten in terms of the area of greenhouses (Table 2).

Table 2. Area of greenhouses in leading countries and the Republic of Uzbekistan (2019) [4]

1		
Country	Area of greenhouses (hectares)	Hectares per 1000 people
China	1700000	1,271
Spain	52000	1,131
Japan	42000	0.33
Turkey	41000	0.565
Italy	20000	0.331
Netherlands	13000	0.782
Morocco	10000	0.314
France	8500	0.13
Uzbekistan	7175	0.243
Paul sha	6300	0.163
Israel	3000	0.396

Although the area of greenhouses in Uzbekistan is twice that of Israel, it lags significantly behind in terms of export volume. In Uzbekistan, greenhouse area is 0.243 per 1000 people. In these greenhouses, the yield was 3-10 kg/m 2, while in developed countries this indicator is equal to 50-60 kg/m 2. To achieve this result, it is appropriate to introduce innovative developments to existing greenhouses in our country.

As can be seen from the data in Table 2, there are 31,297 greenhouses in Uzbekistan with a total area of 7,175 hectares. Since many regions of the Republic of Uzbekistan have a favorable climate, the location of greenhouses allows saving more resources due to the decrease in the cost of lighting. Experiences of market leaders confirm that results can be achieved thanks to new technologies and without increasing the space.

In the Republic of Uzbekistan, special attention is paid to the cultivation and processing of fruits and vegetables, as well as to the wide introduction and development of greenhouses in the field of fruit and vegetable production. Taking into account limited land plots in Uzbekistan, the production of vegetable products in greenhouses is accelerating due to the expansion of other agricultural activities with high added value.

The main problems of exporting vegetables grown in greenhouses are the inefficiency of the marketing strategy and the lack of diversification of marketing markets, which creates a number of potential risks. First, the instability of the economic situation and the decrease in the demand for fruits and vegetables in the main importing countries can cause serious problems for the agro-industry. Secondly, the monopsony power of the importing countries can create an opportunity for buyers-importers to determine the price of fruit and vegetable products in Uzbekistan.

The indicator of vegetable export volumes of the Republic of Uzbekistan, expressed in millions of US dollars, was used as a dependent variable (Y). Indicators that directly affect export volumes were considered as independent variables (economic factors) [6], [7], [8]: the vegetable production output in the Republic of Uzbekistan (X1); the level of domestic prices for vegetables (X2); the level of world prices for vegetables (X3); yielding capacity (X4); yielding capacity per capita (X5); planting acreage (X6); the volume of domestic trade (X7); investment in the industry (X8); cost of

production (X9); the level of supplying the domestic demand for products in (X10) calculated as the ratio of production volumes to consumption volumes; the level of external demand for products (X11). The data array was formed by standardized values of indicators Y and X1-X11 for Uzbekistan for 2010-2020 aggregated annually (the time series was seven observations).

Based on the experiences of foreign experts, the competitiveness of vegetable products grown in greenhouses in foreign countries and Uzbekistan in the international market was determined. According to it, the level of influence of competitiveness on production volume (X1, priority value 0.02), production value (X9, 0.05), level of satisfaction of product demand in the domestic market (X10, 0.21), climatic conditions (X12, 0.27), the geopolitical situation (X13, 0.09), and the level of trade liberalization (X14, 0.36) were determined by such factors (Table 3).

Table 3.

Vegetable products grown in greenhouses indicators of competitiveness in the international market

Name of countries	Indicator				
	Xl	Х9	X10	X12	
Netherlands	0,02	0,54	0,62	0,22	
China	0,86	0,14	0,08	0,24	
USA	0,1	0,27	0,09	0,27	
Uzbekistan	0,02	0,05	0,21	0,27	

The calculation is based on the author's research.

Volume of production of vegetable products, the greenhouses of Uzbekistan are much lower than those of industrialized countries. Its volume is 43 times that of China, 5 times smaller than that of the United States, and is on par with the Netherlands.

In terms of price, the highest competitiveness is in the Netherlands, and Uzbekistan has the lowest competitiveness according to this criterion. The remote cost also includes the costs associated with maintaining the appropriate climate conditions, but this factor has been taken into account in the evaluation according to criterion X12. A negative trade balance of vegetables was observed in China and the USA. This means that domestic demand is not fully met by domestic producers, despite the fact that the volume of production and export is significantly higher. Sales revenue is high in the Netherlands, which means meeting domestic demand.

According to the criteria of competitiveness indicators in the foreign market, the main problem of the trade of vegetables grown in the greenhouses of our country is the low level of product export and diversification. The price level of vegetables sold in the market is mainly oriented towards profit. Prices determine the attractiveness of the market. Depending on the price and competitive advantages of greenhouses, it is appropriate to develop a strategy of action in this market (Figure 1).



The calculation is based on the author's research. Figure 1. Competitive indicators of countries in the international vegetable market (2019). As can be seen from the picture, when evaluating the competitiveness of the international vegetable market, according to the integrated evaluation, Uzbekistan occupies the indicator - 0.14. In the Netherlands, the level of competitiveness in the sales market is high, which is equal to 0.42.

Based on the integrated indicator, the quantitative and qualitative aspects of evaluating the competitiveness of countries in the international market for vegetables were determined (Table 4).

Table 4.

Criterion of integrated evaluation of competitiveness level of vegetables grown in the greenhouse in the international market

Quality indicators	K ' indicator level
Low	[0; 0 , 16)
Average	[0, 16; 0, 26)
High	[0, 26; 1]

As can be seen from the table, the level of competitiveness of vegetable products grown in greenhouses in the international market is "low" (0-0.16), "average" (0.16-0.26) and "high" (0.26-1) through the integrated assessment criteria is evaluated.

The price level is determined by the price index. The stable price level corresponds to the value of 1 of the index and its confidence interval, allowing a 5 percent error [0.95; 1.05], taking into account the deflation - [0; 0.95), inflation will be equal to - $(1.05; +\infty)$.

The matrix constructed in this way provides an opportunity to take into account the current market conditions, export volume, potential and the main objective of the greenhouse vegetable market is to increase the income. According to the matrix pricing strategy of countries in the international market for vegetables, China and the Netherlands are leading countries and have strategies to penetrate domestic and international markets for vegetable products. Also, in this direction, these countries started their activities based on the strategy of high income (Figure 2).



Developed by the author.

Figure 2. International market of countries for vegetables matrix pricing strategy

In the conditions of modernization of the economy, the main factors determining the competitiveness of greenhouses in Uzbekistan are the following: volume of production of vegetable products; production costs; level of satisfaction of product demand in the domestic market; climatic conditions; is the country's geopolitical situation and degree of trade liberalization. One of the main reasons for the low level of competitiveness of Uzbekistan's greenhouse vegetable growing in the international market is the high cost of growing and processing vegetables.

The matrix of the pricing strategy of greenhouse vegetables in the export market is characterized by the low level of competitiveness of greenhouse farms in Uzbekistan today. According to scientists, the main risks of greenhouse farms in the international vegetable market as a result of the formation of marketing strategies in our country are unstable profitability of vegetable export, increase in export volume, poorly organized logistics, lack of stable markets, etc. It is necessary to improve the marketing strategy in order to develop the trade of vegetables grown in greenhouses in Uzbekistan in international markets. First of all, special attention should be paid to diversifying the supply of quality products that meet the standards of the European Union, Japan, Korea and China . Because these countries are characterized by high purchasing power. Therefore, the state should support the organization and development of specialized organizations that supply vegetables grown in greenhouses, dried and processed products to countries with high purchasing power.

Special attention should be paid to optimizing the cost of growing, processing, storing and supplying vegetables. First, it is necessary to ensure the targeted orientation of greenhouse farming to the use of coal to ensure that vegetables become cheaper by 36 percent. National transport companies are recommended to optimize the logistics system for the delivery of fruits and vegetables to the international market by establishing their own large transport fleet and multimodal transport services.

Thus, the developed matrix of the pricing strategy in the international trade market made it possible to take into account the main goal of Uzbekistan's greenhouses, taking into account the country's export potential and earning potential. In this case, it is necessary to introduce incentives depending on the export volume, to simplify the process of concluding export contracts, to introduce a mechanism for assessing the customs value of vegetable products and its certification.

According to the results of the research, to develop the markets for the sale of greenhouse products in Uzbekistan, it is necessary to increase the export of vegetables, that is, the supply of products to countries with a high level of consumption. In order to ensure the competitiveness of vegetables grown in greenhouses in the international market, it is necessary to establish production, storage and processing of products based on requirements. This, in turn, leads to a steady development of the level of competitiveness (integral index value [0, 0.16]) of greenhouses in selling vegetable products on the international market in the main exporting countries, such as the USA, the Netherlands, and China. In order to effectively organize the sale of vegetables grown in greenhouses in international markets, it is advisable to develop marketing and logistics systems of production and delivery of products, and to export diversified products to Europe, China, Korea and Japan.

Conclusion. Also, our country has important resources such as favorable climate conditions and protected lands that serve to develop an alternative climate. Therefore, using innovative hydroponics can improve the situation by saving resources, reducing production costs and stabilizing production. It is important to use innovations aimed at saving energy sources, because today they account for 50% of the cost of production. This is the priority direction of introducing innovations to the greenhouses of the Republic of Uzbekistan. The introduction of fifthgeneration greenhouses in our country will help to save 92672300 US dollars annually. In addition, reduction of energy tariffs in agriculture as a result of state support also helps to save energy. All this, along with an increase in the volume of exports, reduces the import of vegetable products and in turn ensures the country's food security. The experience of the world leaders in the field of greenhouse management shows that there are limited areas and not always a favorable climate, but with the help of innovative technologies, it is possible to save various resources necessary for growing products in large quantities and managing smart greenhouses.

References:

1.Decree of the President of the Republic of Uzbekistan dated March 20, 2019 "On measures to further develop horticulture and greenhouses in the Republic of Uzbekistan" i. - www.lex.uz.

2.Makarenko O. Teplichnaya sverkhderjava, nalog na domashnih jivotnyx i rost sprosa na navoz. - Sieve. magazine, Mirovoe obozrenie. - https://oko-planet.su

3.Medvedeva A. _ (2018) Mirovye i rossiyskie perspektivy teplichnogo ovoshchevodstva. APK NEWS, 7 (1): 35-37, https://www.elibrary. ru/item.asp?id=35330779;

4.Durmanov, A. et al. (2021). Development of the Organizational and Economic Mechanisms of Greenhouse Industry in the Republic of Uzbekistan. Journal of Environmental Management and Tourism, (Volume XII, Spring), 2(50): 331 - 340. DOI: 10.14505/jemt. v12.2(50).03 5.Saipov Z., Arifdjanov G. Selskoe hozyaystvo ukhodit pod kryshu. - J.: Ekonomicheskoe obozrenie, 2019. - No. 5 (233). - https://review.uz/ post/selskoe-khozyaystvo-ukhodit-pod-kriyshu

6.Daruich, D., Easterly, W., & Reshef, A., "The surprising instability of export specializations", Journal of Development Economics, Vol 137, pp. 36-65, 2019.

7.Dohse, D., & Niebuhr, A., "How different kinds of innovation affect exporting", Economics Letters, Vol 163, pp. 182-185, 2018
8.Yang, X., Cai, G., Chen, Y.-J., & Yang, S.-J.S., "Competitive Retailer Strategies for New Market Research, Entry and Positioning Decisions", Journal of Retailing, Vol 93, No 2, pp. 172-186, 2017

IMPORTANT ASPECTS OF FOREIGN EXPERIENCE ON IMPROVING THE EFFICIENCY OF LAND RECLAMATION MEASURES

B.Sultanov, Head of the Department of Economics, NRU "TIIAME", Doctor of Economics, Senior Researcher

Abstract

This article gives information about foreign experiences related to land reclamation measures, the formation, and important aspects of foreign experience in land reclamation in agri-culture, etc. In addition, the state of land degradation in the world, regional aspects of improving the efficiency of water resources use, developing infrastructures in the field of land reclamation of the republic are presented in this paper.

Introduction. Changes in the global ecological situation on a large scale, taking place in the subsequent period, in accordance with the growth of the world's population, the possibilities for the development of irrigated agriculture become limited, the priority of the development of industry and other sectors in the world economy is growing from the priority of agricultural production, and the reduction of irrigated lands in the sector has negative impact on agriculture. In this situation, based on the natural and climatic conditions of the regions, the issue of effective organization of land reclamation measures in order to preserve the natural fertility of the soil, and form expanded reproduction has become one of the urgent problems on a global scale.

Observation of the main trends and forecasts in the study of land use and melioration problems in the world economy allows us to draw the following conclusions:

1. In the last century, the consumption of natural resources as a result of economic activity was greater than in the entire history of human civilization. Due to the fact that the development of the world economy is based on extensive factors, and due to a significant increase in resource consumption, environmental problems have become relevant.

2. 11% of the world's land fund (1450 million hectares) are arable lands and orchards. Ecologists estimate that the limited amount of arable land is 1,500 million square meters. should not exceed one hectare. So, practically all stocks of arable land are used by mankind. Otherwise, there will be a sharp increase in the ecological crisis [1].

3. The reduction in land area occurs mainly due to two cases, i.e. processes of urbanization and degradation as a result of increasing world population. According to forecasts, by 2030 the weight of cultivated land per capita in the world will decrease from 0.10 ha to 0.08 ha [2]. As a result of various levels of degradation processes, about 2 billion hectares of fertile lands have been lost in the entire history of the development of civilization [3]. This is more than the total area of agricultural land available today.

Materials and Methods. According to the results of the analysis of scientific and practical sources, in most of them, the process of land degradation on a global scale is interpreted as conditionally divided into four types, and the main directions of ways to eliminate them are presented (Table 1).

It can be seen from the table above that 1/4 or 25% of the land resources used in the world today are severely or completely degraded. The possibilities for their restoration

are practically limited: 42 percent of the land is partially or less degraded, and only 10 percent of the land is in a state of sustainable use.

The state of land degradation in the world [4]

Table 1.

Types of land degradation	Exclusion Optio
1. Severely degraded or fully degraded	Take measures to restore or p
land - 25 percent	consequences in cases where
	as economically feasible.
2. Degraded and partially degraded land -	Elimination of the con
8 percent	degradation based on restoration
3. Lands in a stable state and less	Regular reclamation activities
degraded - 36 percent	
4. Developing, that is, stable lands - 10	Ensuring an enabling enviro
percent	improved sustainable land
	systems

4.In recent times, there is a possibility of observing a dangerous trend of decreasing water resources and increasing the frequency and duration of droughts. Because under the influence of economic activity in many countries of the world, the annual flow of rivers is decreasing.

5.The last century can be considered the century of irrigation and chemicalization. Because over the past century, the consumption of mineral fertilizers in agriculture has increased 10 times, and the area of irrigated land sharply increased from 48 million to 278 million hectares between 1900 and 2000. 35-40 percent of irrigated lands are secondarily saline and waterlogged due to ecological imbalance. For this reason, on average, 10 million hectares of irrigated land are withdrawn from the agricultural cycle every year [5].

6.Global climate change also creates the need for a climate change-adapted agricultural production system in the future. After all, experts recognized that from the middle of the 19th century to the beginning of the 20th century, the temperature on our planet increased by 0.7 degrees [7], and by 2100 this figure is expected to increase by 3.7-4.8 degrees [8]. According to the calculations of climatologists, an increase in air temperature above 2 degrees has serious negative consequences.

In general, in the context of the noted negative trends in the full use of agricultural land, especially in developed countries, arable land loss is achieved through effective reclamation measures, increasing crop yields based on the organization of production on an innovative basis, but the opposite is observed in developing countries. In fact, the purpose of land reclamation in different countries is different. Because in some countries the goal is to maximize profits, in others - to solve the food problem, and in others - to protect the environment.

Also, the growth rate of irrigated land in the countries

of the world also depends on the state of economic development of these countries. According to the analysis, the growth rate of irrigated land in developed countries has decreased since the 1980s. This is explained by the goal of increasing crop yields and processing volumes based on effective land reclamation measures in these countries, and on the other hand, mitigating the impact of production on the environment.

The growth rate of irrigated land in developing countries (with the exception of the Central Asian republics) continued until 2000. This is explained by the need to increase food production, despite the limited water resources and the deterioration of the natural environment. In the countries of Central Asia, this indicator is explained by the reduction of water resources and the deterioration of reclamation of irrigated lands (appendix).

In conclusion, if we characterize the general direction of modern solutions to improve land reclamation, then in recent years the issue of sustainable management of natural resource protection processes has changed preexisting ideas on a global scale. This necessitates an increase in food production while reducing the impact of production technologies on the natural environment. Of course, traditional approaches to environmental management and existing socio-economic conditions in developing countries limit the ability to carry out this task.

Based on the analysis of the data presented above, it should be recognized that the application of land reclamation practices of developed countries to the conditions of Uzbekistan requires a detailed assessment of the natural, socio-economic conditions and characteristics of our country, and most importantly, an analysis of the adopted system of values and goals. According to the results of the analysis, organizational and economic measures for land reclamation and their improvement have sharp differences in the countries of the world, and we will try to analyze some of them within the framework of the goals and objectives of this research work.

Based on the foregoing, the United States of America on the creation and application of advanced high-tech reclamation systems, conservation, restoration and development of irrigated lands in the future, advanced training of industry specialists, retraining of personnel, promising research and development, as well as the creation and implementation of innovative technologies in the field of reclamation are important aspects of his experience are noteworthy.

Discussion and analysis. The US experience in this matter is unique, and land reclamation in the country and their rational use are under constant control of the Ministry of Agriculture. The process of using reclaimed land in the United States is mainly carried out in five directions.

The first direction - the elimination of negative environmental consequences (land degradation, contamination of soil and water resources with chemical and nuclear residues, etc.) is the primary and main task of the US Department of Agriculture. One of such activities is active participation in environmental programs. It is known that in the 70s of the last century, 37 percent of cultivated land in the United States was severely eroded due to intensive use of reclamation lands. That is why the government decided to temporarily stop the use of eroded lands or completely exclude them from agricultural circulation. In this way, in a difficult and lengthy process, measures to restore soil fertility are carried out on the basis of large economic costs.

The second direction includes activities for the inventory of natural (land and water) and other resources (reclamation equipment, irrigation systems). The main objective of these activities is to produce every five years a specific information database on soil fertility issues such as the state of soil erosion, the quality of water resources, soil salinization, etc. The nationwide inventory of natural resources, which is carried out every five years, is considered important not only for solving soil fertility problems of federal significance, but also at the territorial level of states and local agricultural associations. It should also be noted that during the implementation of these activities, specialists from agricultural universities, scientific institutions and colleges specializing in agriculture will conduct their research work together.

The third direction involves the use of resource-saving technologies, such as rain or drip irrigation, to increase the productivity of reclaimed lands. Drip irrigation helps to prevent or reduce soil salinization, which in turn reduces the cost of tillage by 2-2.5 times. It also saves up to 40 percent of water in the irrigation process associated with the irrigation system.

Fourth direction includes the development of measures for the "alternative use of reclamation lands", which were put into practice in the 60s of the twentieth century. Alternative land use is based on a complex of reclamation methods: tillage, crop rotation, changes in the composition and condition of sown areas, biological methods of plant protection, etc.

The fifth direction is advanced training and retraining of personnel. According to American scientists, the main factor in economic growth in the course of human development is not capital or production methods, but knowledge and new ideas aimed at ensuring the production of competitive products, that is, human capital.

One of the attributive elements of the development of innovative mechanisms is the introduction of a knowledge extension service, i.e. information and advisory service, which is an effective function of managing agricultural production and coordinating production volumes in accordance with market requirements. It was first applied in Great Britain in 1840 and made a significant contribution to improving the efficiency of agricultural production and expanding the scope of consumption.

Information and consulting services are a systematized organizational and structural form of multifunctional processes and tasks. The main ones are:

- help farmers analyze achievements and determine the most effective ways for the near future;

- implementation of the results of scientific research in the agricultural sector in the educational process and practice;

- proportional development of intensive and extensive factors of agricultural production, assistance to farmers in the development of resource-saving innovative technologies;

- strengthening the motivation of farmers to implement the options and technological solutions chosen by farmers;

- making decisions and giving advice related to the production of environmentally friendly products, services and other issues by farms

In conclusion, it is appropriate to recognize the following main conclusions that emerged as a result of research on the effective use of reclaimed land in the United States:

- the experience of developed countries shows that the

priority of state administration in improving the efficiency of land reclamation is of particular importance;

- the use and implementation of alternative farming or "organic" farming, increasing productivity and soil fertility is one of the most important factors in the effective use of reclaimed lands;

- one of the main factors for increasing the efficiency of land reclamation is the increase in the level of knowledge and advanced training of personnel and their retraining. It is recognized that the implemented activities are connected with each other in a chain and are implemented in stages. That is, this unity is clearly manifested in fundamental and applied agricultural research, the development of educational institutions, advanced training of personnel, the effective application of new scientific developments, the systematic training of personnel in various areas of the agricultural sector, and the retraining of agricultural personnel.

At present, it is appropriate to recognize China's experience in the efficient use of reclaimed land. The People's Republic of China has repeatedly surprised the world with its achievements in various fields and non-standard solutions to problems. Also in the field of agriculture, they have achieved many successes in the productive use of reclaimed land. Intensive type of agriculture is suitable for this country. Corn, wheat, soybeans, rice and sugar cane are grown on the black soil of the Northeast Plain, corn, wheat, millet, cotton, vegetables and fruits are grown on the black-brown soil of the North China Plain, rice, vegetables, tea and fruits are grown in the Lower Yangtze Plain. Vegetables, rice and wheat are grown several times a year in the brown, moist soil around Lake Sichuan.

With just 9 percent of arable land and 6 percent of the world's resources through land reclamation, the country manages to feed the Chinese, who make up 22 percent of the world's population. However, the lack of water will seriously affect the further development of agriculture. Because every year the number of industrial enterprises using water is increasing. The current situation has required intensive research to find ways to more efficiently use the water used for irrigation in agriculture.

It should be noted that almost all types of highly efficient land reclamation technologies have been used in China over the past twenty years. The effectiveness of land reclamation was achieved through land reclamation, systematic distribution of arable land, distribution of surface and ground waters, prevention of channel filtration, and improvement of various land reclamation works. This brings the per capita income from agriculture to \$316.7.

Comparing the experience of the People's Republic of China in the efficient and economical use of reclaimed lands with the experience of our republic, the following features should be recognized:

- in this country, the role of state administration in the management of land reclamation and the centralization of water management complexes is significant. However, it does not contradict the development of the market mechanism and the interests of private entrepreneurship. All measures implemented by the state are aimed at the production of new land reclamation technologies that save resources. As well as scientific and technical support for land reclamation, management of large irrigation systems with water consumption and collective forms of farms, lease of land use within the framework of the state system of land reclamation; - development of melioration and irrigation in mountainous areas and pasture districts, organization of state funds and financing of the reconstruction of irrigated lands, which saves up to 41% of water used for irrigation;

- the organization of the main reclamation funds and medium-sized irrigation areas is carried out at the expense of state funds. Yard irrigation networks are organized on the basis of joint activities of farmers and communities of agricultural enterprises based on the support of central and local authorities with the help of state subsidies.

It is strictly forbidden to damage ameliorative structures and technical and technological systems. At all levels of government, the state uses administrative methods to attract private investment to develop irrigation systems and improve the efficiency of land reclamation.

Despite the fact that the People's Republic of China occupies the highest place in terms of scientific and technological development, the country pays great attention to improving the skills of personnel based on best practices at the level of international standards. The Institute of Irrigation and Drainage was opened under the Ministry of Water Resources.

Land reclamation research, as well as training of land reclamation engineers, is carried out in the Beijing National Irrigation Technology Center, many special departments of provincial water resources institutes, universities, colleges, 50 polytechnics and 44 higher technical schools.

Scientific research and high-tech work in the field of land reclamation has led to the establishment of relations with a number of international organizations and countries. In cooperation with Japan, the programs "Center for the Study of Irrigation and Drainage Technology in China" and "Research on Water Supply in Large Irrigated Areas in China" are being implemented. Also, with the support of the World Bank, the project of modern China and the UK "Ways to Eliminate Poverty through the Development of Water Supply in the Chinese Agricultural Sector" is being implemented.

Recently, the experience of our republic in improving land reclamation in the conditions of irrigated territories has been recognized, but, despite this, in our opinion, it is advisable to give a wider place in this research work to the experience of Israel. Because even in conditions of scarcity of water sources in our country, there are universally recognized great achievements in the field of rational use of land resources, increasing soil fertility, producing environmentally friendly agricultural products, and their wider research. and introduction into agriculture of our republic is of great importance.

The territory of Israel is not so big, but its achievements in the field of agriculture are remarkable. First, 80 percent of the purified water is used for growing organic products, including cotton fields and several vegetable fields. Secondly, there is a system of wider and continuous introduction of intensive factors into production processes. In accordance with the regulatory legal acts established by the government, an innovative direction called "Organic Agriculture" has become widespread. Therefore, it is important to study the results of scientific research conducted in the State of Israel regarding the development of agriculture based on an innovative model in the conditions of our republic.

It should be noted that there is a drip irrigation system in Israel, which has created 230,000 hectares of irrigated agricultural fields. An irrigation system consisting of plastic pipes allows crops to be supplied with water at the standard level to the roots. Thus, the efficiency of water use has doubled, that is, from 30 percent to 60 percent. This method is widely used, especially in the field of cotton seed and vegetable cultivation. Irrigation rate is 5.0-5.5 thousand cubic meters.

According to the NAAN company in Israel, the drip irrigation method is noteworthy in that it fully covers the costs of cotton raw materials obtained in the second year, and provides an opportunity for additional profits for agricultural production entities. Under the conditions of cotton cultivation, the highest yield was 6.3 t/ha, and the average yield was 5.0-5.5 t/ha.

Due to the scarcity of running water sources, the rational and economical use of water resources in Israel's agriculture is one of the main problems. In this direction, one of the largest scientific and practical achievements of the country is 100% automation of rain, drip (in open ground) and aerosol (in greenhouses, greenhouses and other types of enclosed structures) irrigation technologies.

As a result, firstly, by meeting the needs of each crop in water within the specified norms and terms, cases of under- or over-expenditure of water are completely excluded. Secondly, nitrogen, phosphorus and potassium fertilizers, as well as microelements, are prepared in liquid form, mixed in appropriate quantities (doses) and applied directly under the roots of crops during irrigation. At the same time, the simultaneous implementation of a multitude of agrotechnological works not only makes it possible to drastically reduce the cost of production, but also ensures the complete assimilation of fertilizers and other essential microelements by agricultural crops during the growing season, and absolutely prevents the deterioration of the soil composition and land reclamation.

At the same time, it should be noted that the effectiveness of land reclamation measures should be considered not only as a result of these measures, but also depends on a complex of other agrotechnological measures, as explained above. For example, on lands with good reclamation, agricultural crops can grow healthy and productive, but untimely protection of them from various diseases, pests and weeds will lead to the loss of a certain part of the crop that can be used, and hence to a decrease in the effectiveness of reclamation measures and the costs spent on them. For this reason, in the State of Israel, much attention is paid to this area and sufficient appropriate resources are allocated - materials, technologies, financial resources, intellectual factors, scientific and technical developments and products.

Innovations used and newly created in the system of plant protection against various diseases and pests in the country have made it possible to completely solve this problem. In particular, a number of innovative drugs created by the country's scientists in the field of pest control are widely used not only in the country, but also in the United States, Europe and a number of other countries. This system is mainly based on innovation in three areas, namely:

- crop care facilities (greenhouses, greenhouses, etc.) are surrounded by

newly developed insecticide-impregnated (pesticides, fungicides, and other preparations) films, fine-mesh membranes, and similar materials that prevent the entry of harmful insects. Harmful insects or various diseasecausing bacteria get on these treated materials and die in the environment itself. Therefore, the speed of their spread in the future will be sharply reduced, and as a result, in addition to closed structures where agricultural which are considered natural enemies of harmful insects, is important for the protection of crops, as well as for growing organic products and protecting the environment from various pollution. Therefore, bio-farms are widespread in the country, where wild insects, but useful for plants and the environment, are bred. Today, their products are exported in large quantities even to the industrialized USA and European countries. In addition, the use of new types of bacteria and fungi, which almost completely destroy harmful insects created by Israeli breeders, makes it possible to fully preserve crop yields.

In general, the innovative activity of the State of Israel in the field of agriculture creates a solid foundation for bringing products produced not only in agriculture, but also in the livestock industry, to the leading positions in the world both in terms of quantity and quality. It is noteworthy that a number of companies in this country have created greenhouses and greenhouse facilities suitable for any natural and climatic conditions with the appropriate infrastructure, they can be operated in all regions of the world, and most importantly, conditions have been created for their guaranteed commissioning with noteworthy assistance from the company's specialists and financial resources. The distribution of greenhouses and greenhouses of this type to all regions of our republic, taking into account local conditions and mental needs, is of great importance not only in terms of continuous provision of the population with agricultural products throughout the year, but also in the regular improvement of reclamation conditions.

It is worth noting that in this country it is customary to introduce new agricultural technologies every year for the production of high-quality and cheap agricultural products, and this process is supported by the state through the creation of various preferential mechanisms and conditions.

Assessment of land reclamation and their effectiveness in agriculture strengthening the legal foundations of this activity, this process is one of the factors directly affecting the effectiveness of management . In this regard, the experience of the Russian Federation in this direction is considered important. First of all, the Law "On Land Reclamation" was adopted in our country, and the adoption of this law combined into one system various phrases, terms and concepts used in practice in the field of land reclamation, and the interpretations given to them, and served to form uniform meanings and tariffs for terms, concepts and categories.

Methods have also been developed and implemented for assessing the economic, environmental and social effectiveness of funds spent on land reclamation, determining the amount of damage caused to agriculture when using natural resources, especially due to the deterioration of land reclamation. Most importantly, the adoption of this law and relevant regulatory documents makes it possible to determine the main directions of state policy in the field of land reclamation , to use state resources for these purposes, and to develop effective mechanisms for state financial support for the industry, and economic stimulation of agricultural producers .

In general, the important aspects of the experience of improving the agricultural land reclamation in foreign countries, analyzed in the course of the study, and their significant aspects can be expressed as follows (Table 2).

Table 2. Important aspects of foreign experience in land reclamation in agriculture

Important aspects of forsign experience	Important aspects of use in the economy of the Republic
In the direction of providing regulate	ory documents on land reclamation and assessing their
	effectiveness:
Land Reclamation Law (Russia)	The legal framework for activities related to the control, regulation and use of land reclamation will be improved. It also combines phrases, terms and concepts and the interpretations given to them into a single system and serves to form unform meanings and tanffs for terms, concepts and categories.
Methods for assessing the economic,	It will be possible to manage the effectiveness of land
environmental, social efficiency of land reclamation measures (Russia)	reclamation measures and the investments spent on them, as well as to develop plans for the future.
Methods for determining the amount and extent of damage caused by nature management (Russia)	It will be possible to determine the size and extent of lesses incurred by agricultural enterprises when using natural resources, in particular, from the deterioration of the amehorative state of lands. Thanks to fins, economic incentive mechanisms for agricultural entities will be introduced
In the direction of organizations	al measures aimed at improving land reclamation:
Development and implementation of a conservation program (USA)	It will be possible to implement measures to restore soil fortility based on long-term and high economic costs
natural (land and water) and other	Every five years a specific information database on soil
resources (reclamation equipment, irrigation systems) (USA)	fertility issues is formed. On this basis, it will be possible to control land reclamation.

Conclusion. One of the main conclusions arising from the content and significance of the above foreign experience is that modern advanced technical and technological methods developed in developed countries for the efficient use of reclaimed lands, as well as achievements in the field of economic and financial support of agricultural production entities, and step by step implementation of those measures in our republic should be considered as an important direction.

¹ Developed by the author.

reclaimed land (USA)	Opportunities will be created for soil cultivation, crop rotation, changes in the composition and condition of sown areas, the introduction of biological methods of plant protection, etc.	
Extension Service, i.e. Information and Advisory Services Organization (USA)	Based on the systematization of multifunctional processes and tasks, an effective service for agricultural producers is formed.	
Establishing links with international organizations and countries of scientific research in the field of land reclamation (China)	A base will be created for the creation of an innovative information and analytical center for reclamation control.	
Creation of biofarms (China)	Insect breeding activities that are beneficial to plants and the environment are carried out.	
In the direction of encouraging the economical use of natural resources [6] :		
If consumers use water in excess of the limit, a fine of 10 times the cost of excess water will be charged (Israel).	It will be possible to establish effective penalties or incentives for exceeding water consumption.	
\$0.50 fine for each cubic meter of water discharged by a consumer who takes water for irrigation purposes (Israel).	A basis will be created for the application of financial incentives or, conversely, penalties to a producer that saves water resources.	

References:

1.Odum Yu., Khomyakov P.M. Modeling the development of an ecological system. L., Gidrometeoizdat, 1991, - 207 pages.

2.Halveil B. Reduction of sown areas. Environmental trends that shape our future. WWNorthon & Co. _New York and London, 1999, p. 43. 3.Sustainable development of agriculture and rural areas : Foreign experience and prob-lems in Russia. M. 2005, p. 54-206.

4. The State of the World's Fuel and Water Resources for Food and Agriculture (SOLAW) report . - at l. 46. (p. 22).

5.Degradation of irrigated lands: a global perspective, 2005, p. 150.

6.Sangirova U.R. Improvement of economic relations between water user associations and farms. T.: TIQXMMI, 2018. - 143 p.

7.ttp:/www.unitar.otg/newsletter.

8.http://tass.ru/spec/climate.

PROSPECTS OF OPERATION OF PUMPING STATIONS ON THE BASIS OF PUBLIC-PRIVATE PARTNERSHIP

G.Dusmuratov, Candidate of economic Sciences, Associate Professor of the Department of Economics, "TIIAME" NRU

Abstract

The prospects for the operation and management of pumping stations based on the mechanisms of public-private partnership (hereinafter referred to as PPP) are considered. Based on the analysis of the activities of the Department of Pumping Stations and Energy under the Ministry of Water Resources of the Republic of Karakalpakstan, the effectiveness of the implementation of PPP projects is substantiated. In addition, recommendations and proposals are made to improve the implementation of public-private partnerships in the operation and management of pumping stations, which will reduce the cost of their operation.

Keywords: public-private partnership, pumping stations, development concept, cost savings, water resources, water management.

Introduction. Consistent reforms have been implemented in our country on the effective use of water resources, improvement of their management system, modernization and development of water management facilities in recent years. However, there was no strategic document - Concept, which would define specific goals, directions, medium and long-term perspective of water management development, and would serve as a basis for the development of sector-related programs. In order to find a solution to this issue, Decree of the President of the Republic of Uzbekistan dated July 10, 2020, No. PF-6024 "On approval of the concept of water management development of the Republic of Uzbekistan for 2020-2030" was adopted.

Currently, 10.7 thousand m³ of water from all sources is consumed on average for 1 hectare of cultivated land used in agriculture in our republic. In developed countries, this figure is 6.5-7 thousand m³. In recent years, 298,000 hectares of irrigated land have fallen out of use, and 560,000 hectares have low water supply, 46% of irrigated land has varying levels of salinity. As a result of long years of use, 60% of irrigation canals and 70% of trays are worn out. It is necessary to repair, reconstruct, replace 15-20 percent of them.

70 percent of the total funds allocated from the State budget for water management are spent on electricity. Only 3 percent is directed to repair and restoration works. 32,600 employees work in the industry, their average salary is 1.5 million UZS, compared to the average salary for the country (2.3 million UZS) is 65 percent. Every year, 3-4 thousand employees come to work and write resignation.

According to the World Resources Institute:

Uzbekistan is among the 25 countries prone to water shortages;

By 2030, the total water deficit is expected to increase by 2.3 times (from 3 km³ to 7 km³);

in the next 10-15 years, water supply per capita will decrease by almost 2 times (3-1.6 thousand m³), but the demand for water will increase by 20% (2.3-3 billion m³), water consumption of industry and energy sectors will grow by 84 percent (1.9-3.5 billion m³).

Taking this into account, the decree of the head of state was a timely, extremely relevant and important document.

With the concept, there will be many changes and updates in the field of water management of our country. PPSs and outsourcing will be introduced into the industry. Emphasis is placed on the training of personnel, improvement of their qualifications, implementation of scientific achievements and innovations. Based on the concept, the Ministry of Water Management was assigned the task of implementing 50 projects in water management based on the principles of PPP until 2030. According to the decree, it was allowed to transfer the functions of the Ministry of Water Management in the direction of management of water management facilities located on these lands to agricultural land owners on the basis of public-private partnership. The Ministry of Water Management, together with the PPP Development Agency, submits to the Cabinet of Ministers a list of water management facilities on the Ministry's balance sheet for transfer to the private sector on the basis of PPP within 3 months.

Materials and Methods. It is necessary to deepen reforms in the field of water management in several directions. In particular, improving the management system of the water management complex and adapting it to market relations, strengthening the material and technical base; increase the capacity of existing water reservoirs and build new ones, further improve the condition of land water supply; implementation of measures aimed at reducing water wastage due to the repair of water supply channels and pumping stations; increasing the amount of output per cubic meter of water due to the improvement of irrigation technology, and finally, introducing water fees, incentives for efficient use of water, and applying economic penalties for low water efficiency. In our country, the implementation of activities in the directions indicated above has been started. To implement these measures, it is necessary to improve the mechanism of water resources management and irrigation sector development.

Nowadays, 1,687 pumping stations at the expense of water management organizations are operating. 74% of them have been in service for more than 30 years, 20% for 20 years, 6% for more than 10 years, or 94% of pumping stations have passed the normative service life (16-18 years) and need to be modernized and replaced, 10.3 percentage of a total of 2,887 km of pressure pipelines is required to be replaced first. As a result of the measures not being implemented on time, there are many cases of accidents in their use, and this, in turn, causes the consumption of electricity to remain high. As a result of research, Karakalpakstan pump stations and energy department electricity saved as a result of activities information on the amounts is presented (Table 1). The table shows that the total amount of electricity saved in 2020 is 2,396 million kWh. These savings are the result of measures implemented in 2018-2020 at the expense of electric motors, pumping stations, capacitors, frequency

converters, solar batteries, cables.

About the amounts of electricity saved in 2020 as a result of the activities carried out based on the programs approved by the Karakalpakstan pumping stations and energy department under the Ministry of Water Management of the Republic of Karakalpakstan **INFORMATION**

The total nt o Total talled, p amoun, c. electricity saved in 2020 million kWł Saved in 2020, milli-Saved in 2020, m^{an} Saved in 2020, milli-Event n ballet n Installed no Installed no kWh At the expense of 78 0,505 0,039 37 0,28 33 0,186 At the expens pumps 30 0,187 8 0,052 12 0,106 10 0,029 127 1,134 40 0,311 38 0,325 49 0,498 At the expense of 6 2 2 2 equency converter 12 0,036 0,002 10 0,032 0,002 2,245 0.028 0,095 0.003 0,85 0.008 1,3 0.017 TOTAL 2.396 0.407 0.751 0.732

Currently, the maintenance costs of water management organizations are carried out from the state budget, and 70% of the funds allocated in the following years are directed to cover the electricity costs of pumping stations, so it is important to provide pumping stations on the basis of PPP. For example, 246.5 million UZS of budget funds are being spent on the Madaniyat pumping station in the Republic of Karakalpakstan (Table 2).

Table 2.

Table 1.

Analysis of the operation of the "Madaniyat" pumping station in the Republic of Karakalpakstan

		Used energy					Fuel		
Name of pumping stations	Salary (thousan d UZS)	Quantity (thousan d kW)	Electricity (thousand UZS	Comple te repair (thousa nd UZS)	Current mainten ance (thousan d UZS)	Transp ortatio n costs (thousa nd UZS)	lubric ants expen diture (thou sand UZS)	Releas ed water (thous and m3)	Total costs (thousa nd UZS)
	2017								
Madaniyat	66900	179,909	35046,3	-	1914	38,28		5370	103898
2018									
Madanivat	88500	258,54	57809,5	-	409,8	8,2		6478	146728
2019									
Madanivat	82300	172,64	59847,4	13268	2408	313,52		4475	158137
	237700	611,089	152703,2	13268	4731,8	360		31323	408763

Table 3.

2025

116,6

29,2

114.7

50,6

3

311,2

10

2026

124,8

31,2

122.8

54,2

3

332,9

10

133,5

33,4

131.4

58.0

2.5

356,2

10

2028

142.9

35.7

140.6

62,0

2

381.2

10

2

10

2024

109,0

27.3

107.2

47.3

3.5

290,8

10

2023

101,9

25.5

100.2

44.2

4

271,8

10

Expected cost reduction at the "Madaniyat" pumping station in the Republic of Karakalpakstan, million UZS

2023

95,2

23,8

93.7

41.3

4.5

254,0

10

2021

89,0

22.2

87.5

38.6

5

237,4

20

ē expens

2020

92,4

23.1

90.9

40.1

6

246,5

Measuren unit

million

million

million

million

million

UZS

%

UZS

UZS

UZS

of pcs

UZS

Types of

expenses

[onthly

7.5%) ingle social

ayment

lectricity

0.4%)

6.9%)

cpenses

6.2%)

umber

unds located

ıdget .00%)

nployees

om the total

ercentage of

ecline, %

ther

ilarv

As a result of giving the operation of the pumping station to a private partner for a period of 10 years through a PPP, the amount of funds financed from the budget was reduced to 20% in the first year and from 10% in the following years (Table 3).

The partnership of the state with the private sector is a crucial component of the investment policy of the Republic of Uzbekistan, as it provides a great benefit from the invested funds when it is properly organized.

If we take into account that 60% of the agricultural arable land in our republic is irrigated through pumping stations and irrigation wells, the damage caused to the country's economy by each unit of excess water used by the farmer as a result of raising water using them will increase even more. This, in turn, leads to physical and mental wear and tear of existing pumps. Most of the existing irrigation infrastructure, pumping stations, are in use for more than 30-40 years and need reconstruction or major repairs.

An analysis of the expenditures of the Karakalpakstan pumping stations and energy administration shows that the expenditures in the system have increased dramatically (Table 4). In 2021, wages and allowances are increased 4671.0 million UZS. Cost reduction measures should be implemented.

Table 4.

Analysis of expenditures on Karakalpakstan pumping stations and energy administration (million UZS)

№	Name of expenses	2019	2020	2021	2021 year compared to 2019 (+; -)
1.	Wages and allowances	20603,9	22648,1	25274,6	+4671,0
2.	Allocations to social needs	5213,9	5553,7	6371,0	+1157,1
3.	Expenditure on goods and	26928,1	44824,0	29788,2	+2860,1
	services				
4.	Expenditure on fixed assets	368,7	628,4	789,8	+ 421,1
	Total:	53114,6	73654,2	62223,6	+ 9109.3

Discussion. To implement this, the following proposals and recommendations were developed to improve the implementation of pumping station operation on the basis of PPP:

organization of study of territorial objects jointly > by the ministry and relevant agencies;

to allow the selection of any projects with economic efficiency and social significance, regardless of the scale of the project, the source of financing (out of the state budget or the state budget);

> to explain the mechanism of § PPP to business entities operating in the regions (organization of seminars);

allocation of funds from the > 152,9 state budget to ministries and agencies for the development of project documents ^{38,2} and the implementation of stages in the

projects where the project is planned to be ^{150,4}implemented on the initiative of the state,

66.3 and the establishment of a special fund; reduction of Central Bank loan > rates for the implementation of projects. Establishment of preferential lending by

407,9 banks, first of all, to PPP projects;

organizing > the attraction of funds from international financial organizations and foreign investors to projects;

27

> organizing the attraction of funds from international financial organizations and foreign investors to projects;

> clarify whether the total cost is one million US dollars (whether investment funds are provided by the private partner or the total costs incurred during the project period);

> if the expenses allocated from the state budget in the period used for calculating the project expenses are not sufficiently financed, taking into account the coordination of these expenses in the next financing period and providing sufficient funds.

> development of the procedure for reimbursement of investment funds introduced by the private partner and operating expenses in cases where the project expenses are to be covered from the state budget and clarification of the following cases. Including:

• in case the expenses of the period based on the project are sufficient to cover the costs of the project, to allow the issuing of a financial summary with the signature of the employee responsible for the direction of the Ministry of Finance, or to allow the Ministry of Water Resources to spend the state budget funds independently (in case of saving funds during the implementation of the project, from covering the expenses transfer of the increased funds to other purposes, such as encouraging employees who have made an effective contribution to the implementation of the project, modernization of facilities in the area where the project object is located);

• Allowing additional funds to be allocated from the budget if the period costs based on the project are not sufficient to cover the project costs.;

• To allow the financing of projects of social importance, which have economic efficiency regardless of the scope of the project, the work to be performed, and the size of the critical investment.

In conclusion, in order to successfully apply PPP in the field of water management in our country, it is necessary that not only service users are in favor of attracting a private partner, but also that both state and local authorities realize the need for cooperation with the private sector. Otherwise, it is impossible to implement some project on the basis of PPP. Thus, direct water consumers and the private sector are also involved in the management of pumping stations in the water industry, which allows for the organization of management in accordance with the requirements of this location and has a positive effect on the very efficient and economical consumption of water, unlike the methods of managing the water industry infrastructure that were previously used uniformly for the entire region. shows.

References:

1. Law of the Republic of Uzbekistan dated January 22, 2021, No 669 "On amendments and additions to some legal documents of the Republic of Uzbekistan in connection with the improvement of the legislation on public-private partnership, as well as declaring some legal documents as invalid". https://lex.uz/docs/5235535.

2. Decree of the President of the Republic of Uzbekistan dated July 10, 2020, No. PD-6024 "On approval of the concept of water management development of the Republic of Uzbekistan for 2020-2030". https://lex.uz/docs/4892953.

3. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated April 26, 2020, No. 259 "On improving the procedure for the implementation of public-private partnership projects". https://lex.uz/docs/4798603

Umurzakov U.P., Dusmuratov G.D. "Public-private partnership in agriculture and water management". Textbook. – T: 2019. - 288 page
 Djumaniyazov U.I. "Some theoretical and methodological issues of corporate management development based on public-private

partnership" "Economics and innovative technologies" scientific electronic journal. No. 3, May-June, 2017, www.iqtisodiyot.uz. 12 page. 6. Oblomurodov N.N. "Attracting foreign direct investments on the basis of public-private partnership" "International Finance and Accounting" scientific electronic journal. No. 6, December, 2018. 6 pages.

7. Bekimbetova G.M. "Public-private partnership - the potential for the development of investment projects in Uzbekistan" "International Finance and Accounting" Scientific electronic journal, No. 4-5, August-October, 2018. 9 page.

8. Shafkarov F.Kh. "Public-private partnership in water management" Journal "Agroiqtisodiyot" No. 2, Tashkent. 2018 B. 45-48.

9. Kamaletdinov U. "Ways of developing PPP mechanisms in the energy sector of Uzbekistan". https://finance.uz/index.php/ru/fuz-menu-economy-ru/4501.

10. Muminov Sh. "Economic models of public-private partnership in water management" "The collection of materials of the republican scientific-practical conference on priority directions and implementation mechanisms for the development of public-private partnership in agriculture and water management" May 1-2, 2019. Tashkent 2019 p. 517-521.

11. Dusmuratov R.D. "Justification of payback periods of investments involved in public-private partnership" "Collection of materials of the republican scientific-practical conference on the priority directions and implementation mechanisms of the development of public-private partnership in agriculture and water management", May 1-2, 2019. Tashkent 2019 p. 350-354.

12. Rashidov J., Shoibekov T. "Development of water management infrastructures on the basis of public-private partnership" "Collection of materials of the republican scientific-practical conference on the priority directions and implementation mechanisms of the development of public-private partnership in agriculture and water management" May 1-2, 2019. Tashkent 2019 p. 251-253.

13. Asian Development Bank, 2008, "Public-Private Partnership Guidelines", Available online at: http://www.adb.org/documents/public-private-partnership-ppp-handbook-ru.

14. UNECE "Practical guidance on the issue of effective management in the field of public-private partnership", [Electron. resource], Geneva, 2008 - Access mode: https://www.unece.org/fileadmin/DAM/ceci/ publications/ppp_r.pdf

15. Margolina E. V., Spitsyna T. A. "Mechanisms for stimulating and financial support for the development of water management" Monograph - M. : Megapolis LLC, 2018. - 113 p.

16. V.F. Stukach, E.V. Shevchenko "Water management infrastructure of the agro-industrial complex" Monograph - Omsk: LLC IPC "Sphere", 2009. - 172 p.

WAYS TO INCREASE THE EFFICIENCY OF INNOVATIVE ACTIVITIES IN THE POULTRY INDUSTRY

S.R.Umarov, M.E.Raxmataliev "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

Abstract

The aim of the study is to develop scientific recommendations and practical proposals for ways to improve the efficiency of innovation in the poultry industry in the context of economic modernization. Keywords: **poultry production, efficiency of innovation, government support, food supply.**

Introduction. The development of the poultry industry plays an important role in providing food in proportion to the growth of the world's population in terms of quantity and quality. Since poultry meat occupies a special place as a source of high-quality proteins and fats in the food supply system. It is the main contributor to the world's meat production. According to the FAO, "... by 2026, the annual production of poultry meat will increase by 13 percent", this trend will continue in the future. This, of course, is due to the increase in the range of poultry products, the availability of mechanisms for effective support for the supply of environmentally friendly and natural products based on the use of productive feed.

Many different research projects have been carried out in such areas as preserving and increasing the gene pool of birds in the context of global climate change and the global pandemic, optimizing diets and feed components, and increasing competitiveness in the poultry products market. Along with this, special attention is paid to scientific research aimed at solving problems to prevent the rise in food prices through the widespread introduction of innovative technologies and developments in the poultry industry and the expansion of poultry production.

The expansion of poultry production in the country's agriculture and the strengthening of the industry's economy primarily directly depend on the state of promoting the achievements of the scientific and technological development of the industry. Increasing innovation in the poultry industry will improve product quality, production efficiency and competitiveness of poultry products. In this regard, "stimulating research and innovation activities, creating effective mechanisms for the widespread introduction of scientific and innovative achievements into practice", in the future, were identified as issues of a strategic task in the development of the poultry industry. In this context, the industry needs to develop evidence-based proposals and recommendations for improving innovation.

This dissertation research, to a certain extent, serves to implement the tasks specified in the Decree of the President of the Republic of Uzbekistan № PD-5853 dated October 23, 2019 "On approval of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030", Resolutions of the President of the Republic of Uzbekistan № PR-4576 dated October 23, 2019 January 29, 2020 "On additional measures of state support for the livestock industry", № PR 4015 of November 13, 2018 "On additional measures for the further development of poultry farming", № PR120 of February 8, 2022 "On the development of livestock and its industries in Republic of Uzbekistan for 2022-2026" and other legal documents related to this activity.

Literature review. The level of knowledge of the problem. On the problems of improving the efficiency of the poultry industry in the context of economic modernization, the development of innovative activities at the enterprises of the industry, scientists-economists of our country and foreign countries conducted research work in various areas.

In particular, in the studies of scientists from the CIS countries, Krylov E.I., Zhurovkova M.V., Vlasova V.M., Fatkhuddinov R.A., Khuchek M., Sandu I.S., Bautina V.M., Golubev A.V. and others were raised multi-level problems created the basis for deepening the theory and expanding the practice of innovative development. Bobileva G.A., Zhigalin M.M., Karyukina K.I., Klochkov K.N., Matykin Yu.P. and other scientific practitioners, much attention is paid to the study of various aspects of the scientific and technological development of poultry farming.

Scientific works of agricultural economists of our country such as K.A. Chorieva, R.R. Radzhapova, R. Khusanova, T.Kh. Yuldashev, S. Abdullayeva, S. Khamrayeva, I. Rustamova and others, are mainly devoted to the problems of development and management of agriculture and improving the efficiency of the livestock industry. Therefore, the attraction of modern equipment and technologies, the creation of a new generation of feed in the poultry industry, helps to increase the innovative potential of the industry. Therefore, an in-depth research work is required to improve the efficiency of innovation in the poultry industry.

Materials and Methods. The aim of the study is to develop scientific recommendations and practical proposals for ways to improve the efficiency of innovation in the poultry industry in the context of economic modernization. The objectives of the study are: theoretical substantiation of the main directions of innovative development and evaluation of the effectiveness of the poultry industry; development of scientific and practical proposals based on the study of the experience of foreign countries to improve the efficiency of innovation for implementation in the country's industry; development of proposals for identifying and eliminating existing problems based on the current state of development and analysis of the activities of poultry enterprises.

Results and Discussion. The theoretical foundations of innovative development, the main directions for evaluating the effectiveness of innovative activities and foreign experience in improving the efficiency of innovative activities in the poultry industry are highlighted.

The state and prospects for the economic development of the country's poultry industry largely depend on the level of development of innovative ways of developing poultry enterprises. Based on world practice, we can say that the competition is dominated by organizations that regularly engage in various forms of innovation.

In our opinion, innovation is an innovation that is the result of the development of science and technology, has been repeatedly tested in production, and is also ready for active participation in the innovation market. A distinctive feature of innovation as a commodity is the ability to commercialize an idea, since not all ideas become innovations.

The process of introducing innovation in a poultry enterprise includes the following steps:

1. Collection of data on introduced innovations. The Bank of Innovations is regularly replenished with specialists.

2. Analysis of novelty and its features. The capabilities of the enterprise are assessed, substantiating the expediency of the decision to introduce this innovation and its effectiveness in production.

3. Determination of the place of the poultry enterprise based on the study of an innovative project.

4. The implementation of measures to introduce novelty will allow customers to get an idea of innovation.

5. Mass introduction of innovations in poultry enterprises. At the same time, an analysis of the innovation market is carried out and, on its basis, new ideas for the modernization of production are born, and their appropriate compliance with implementation is also assessed.

The development of innovative activity requires the following conditions in the poultry industry of our country:

- state innovation policy - development and definition of mechanisms for supporting priority innovation programs and projects for the purpose of the country's innovation strategy by the state authorities of the Republic of Uzbekistan;

- investment potential - states, industries, enterprises and organizations, including material, financial, intellectual, scientific, technical and economic;

- innovative activity - areas of activity for the creation and implementation of innovative developments, including consumers and manufacturers of innovative products;

- innovative infrastructure - institutions that promote the implementation of innovative activities (innovation and technology centers, technology incubators, technology parks, consulting companies and other specialized institutions);

- innovation program - a complex of enterprises, industries, territories, states, regions, interstate innovation projects and activities that provide an effective solution to the problems of development and deployment of resources, performers and deadlines for the implementation of innovative projects and new types of products.

Technical and technological, organizational, economic, socio-psychological, natural-climatic and environmentalepidemiological factors influence the increase in the efficiency of innovative activities of poultry enterprises.

The technical and technological efficiency of innovation activity reflects the degree of intensity of resource use in the process of production, processing, transportation and storage of poultry feed products. The factors of this group include: the degree of modernization of buildings and structures, new machinery and equipment for the production and processing of poultry products; availability of capital funds, productivity and safety of birds, cross-country level; optimization of the order of feeding, equipment with computer facilities; compliance with the requirements for the quality and safety of poultry products, etc.

Organizational efficiency reflects a complex of microeconomic factors that ensure the effective organization of the activities of poultry enterprises. It also regulates labor relations within enterprises, defines formal and informal relations related to the activities of the enterprise.

The level of organization of production determines the orderliness and correspondence of the constituent parts of the mechanism of activity of enterprises in the industry. The economic efficiency of innovation determines the efficiency of resources spent on a new product or technology (cash, material and technical, information, labor, etc.). This determines the investment attractiveness of the enterprise, the level and concentration of specialization, the proportional organization of production, the interaction of departments and the effective implementation of the pricing policy at enterprises.

Socio-psychological efficiency includes the level of desire of the staff of the poultry enterprise to introduce innovations and the conditions created for highly efficient working conditions and the production of quality products. Social efficiency will be reflected in the standard of living of the population, the system of education, health and culture, and the satisfaction of aesthetic needs. Increasing the intellectual potential of personnel, computerization of production is the determining factor in solving complex production and economic issues.

Natural and climatic efficiency factors include natural and climatic (precipitation volume, temperature level, atmospheric pressure, seasonal changes, etc.) factors that affect the bird's body on average.

Ecological and epidemiological factors provide for the maximum satisfaction of the needs of the population in environmentally friendly poultry products. To do this, it is advisable to implement the following measures: the effective use of the quality management system, the use of environmentally friendly feed in poultry diets, compliance with sanitary and veterinary requirements, the organization of waste-free production, the improvement of the system for the use of poultry manure (processing) and the preservation of the environment.

Scientific and innovative activity in world practice is supported by the state in various manifestations. In particular, direct financing of innovation activities, the provision of interest-free bank loans to inventive and innovative enterprises, the creation of innovative venture funds using tax incentives, the reduction of the state duty on patents for individual inventors, the use of accelerated depreciation, the creation of technopolis systems, technology parks, business incubators, etc.

In general, based on foreign experience, it is advisable to organize state support for the poultry industry in our country in the following areas:

- allocation of funds for long-term research of leading branches of science and technology, to improve the reputation of the government in the innovation sector (Germany);

- allocation of long-term loans by commercial banks, as well as government funding to stimulate research and development in the poultry industry (Canada);

- allocation of preferential loans and state subsidies for research centers, as well as for state organizations engaged in scientific research together with poultry enterprises;

- providing access to domestic products that can

replace imported products in the poultry market, as well as expanding export opportunities (Japan);

- reduction of the tax base, based on the cost of research equipment provided to companies, universities and non-profit organizations (USA);

- exemption of poultry enterprises from taxation of research costs (Sweden, Finland).

In our country, there is a tendency to increase the number of birds in all categories of farms. In particular, as of January 1, 2022, there are 89,734.4 thousand birds in our country, which is 2.1 percent more than in 2019. During this period, this indicator had an upward trend in all regions, except for Jizzakh, Namangan and Tashkent regions.

Due to the increase in the number of birds in the republic, the volume of egg production also increased. The analysis showed that the volume of egg production in all categories of farms in 2021 increased by 3.6% compared to 2019. That is, in our country in 2019, 7,771.2 million eggs were produced, and by 2021 it will be 8,053.1 million eggs; in 2021, 281.9 thousand more eggs were produced than in 2019. In our country, in 2019-2021, egg production increased in all regions, except for Samarkand and Tashkent regions. In terms of egg production, Tashkent and Samarkand regions are leading. These regions account for 34.7 percent of the eggs produced (2798.8 million pieces).

In accordance with the established medical standards of the Ministry of Health of the Republic of Uzbekistan, it is established that 1 person should consume an average of 208 eggs during the year. According to an analysis based on this medical norm, the volume of eggs produced per capita in the republic during 2019-2021 exceeds the norm. So, in the republic in 2019, an average of 253 pieces were produced per capita, and in 2021 - 255 pieces. This indicator in 2021 compared to 2019 increased by an average of 0.8% in the republic, in Kashakadarya, Namangan, Samarkand, Tashkent and Khorezm regions there is a decrease compared to 2019 (table 1).

Table 1.

The volume of eggs per capita in the republic, pieces

No.	Regions	2019	2021	2021 to 2019
1.	Republic of Karakalpakstan	172	211	123
2.	Andijan region	223	211	95
3.	Bukhara region	251	246	98
4.	Jizzakh region	232	223	96
5.	Kashkadarya region	157	168	107
б.	Navoi region	341	432	127
7.	Namangan region	217	230	106
8.	Samarkand region	357	315	88
9.	Surkhandarya region	200	203	102
10.	Syrdarya region	207	193	93
11.	Tashkent region	518	518	100
12.	Fergana region	140	161	115
13.	Khorezm region	261	342	131
	Total:	253	260	103

Developed by the author.

As follows from the table, in 2021, fewer eggs per capita were produced in the Republic of Karakalpakstan, Kashkadarya, Surkhandarya, Syrdarya and Fergana regions in accordance with medical standards. According to this indicator, the leaders are Tashkent, Navoi and Samarkand regions. In these regions, the volume of eggs produced per capita is 300 eggs and more.

Monographic studies were carried out at the enterprises for the production of eggs and poultry meat in the Uzun and Zharkurgan districts of the Surkhandarya region. In particular, the economic efficiency of egg production at the Bekzod-Zokir-Sarkor enterprise in the Uzun district of the Surkhandarya region was analyzed. According to it, the average cost of eggs produced by the enterprise in 2018 amounted to 521 soums, and in 2020 it increased by 27.4 percent and amounted to 664 soums (table 2).

According to the table, the cost of 1 kg of feed increased by 25.4 percent over this period. The share of feed in egg production is on average 67-70 percent of total costs. There is also an increase in the average selling price for eggs. In particular, we see an increase in the average price of eggs in 2020 compared to 2018 by 24.5%. The cost of an egg in 2018 was 620 soums, in 2019 - 701 soums and in 2020 - 772 soums. Due to the sold eggs, the enterprise in 2020 received a profit in the amount of 1373.0 million soums, which is 83.5 percent more than in 2018. The profit of the enterprise is mainly observed due to the increase in the number of chickens and the number of eggs obtained from them. However, during these periods, the level of profitability of the enterprise due to the production of eggs decreased. In particular, in 2020, the level of profitability of the enterprise decreased compared to 2018 and amounted to 16.2 percent.

Therefore, in the conditions of the country's poultry enterprises, the period of use of chickens should be from 9 months to 22 months. And in some poultry farms, chickens will be operated up to 92-94 weeks. The shelf life of eggs should not exceed 12 months (from 22 weeks to 74 weeks). The values of the poultry turnover ratio vary from 0.8 to 1.4 at a rate of 1.05-1.1. Therefore, the intensity of egg supply in poultry enterprises is 73.5 percent. Thus, if the egg hardness rate is below 73.5 percent, the further preservation of these birds at the enterprise will not bring economic benefits.

The poultry farms that are members of the association "Parrandasanoat" import the main part of the food components necessary for feeding the birds.

Table 2.

Economic efficiency of egg production at the enterprise

No.	Indicators	2018	2019	2020	2020 to 2018,%
1.	Laying hen (loman), day	25000	3 5000	4 2000	168.0
2.	Laying time , day	370	370	370	-
3.	Average daily feed intake of 1 head of chicken, kg	0.094	0.094	0.094	-
4.	Feed consumption per 1 head of chicken for the entire period content, kg	34.78	34.78	34.78	-
5.	Price for 1 kg of feed, sum	3150	3550	3950	125.4
б.	The cost of feed per 1 head of chickens for the entire period content, thousand soums	109.6	123.5	137.4	125.4
7.	Feed costs per day for keeping chickens, million soums	2738 9	4321.4	5770 0	2.1
8.	The number of eggs from 1 chicken head, pieces for the entire period of keeping	303	303	303	-
9.	Feed consumption per 1 egg, kg	0.115	0.115	0.115	-
10.	consumption per 1 egg, soum	361,6	407.49	453.40	125.4
11.	The number of eggs obtained from a laying hen for the entire period of keeping, thousand pieces	7575	10605.0	12726.0	168.0
12.	Cost of production of one egg, sum	521	601	664	127.4
13.	Total expenses, million soums	3948	6378,3	8451.5	2.1
14.	Selling price of 1 egg, soum	620	701	772	124.5
15.	Proceeds from the sale of eggs, million soums	4696.5	7434.1	9824.5	2.1
16.	Profit from eggs, million soums	748.4	1055.8	1373.0	183.5
17.	Profitability level,%	18.9	16.5	16.2	-

The main components of the bird feed balance - wheat, corn, soybean meal, sunflower meal, vegetable oil and salt, soda, fodder lime are supplied by local enterprises. In particular, annual demand is generally met by components produced by domestic enterprises: grain - 66 percent, corn - 30 percent, soybean meal - 7 percent, sunflower meal -6 percent and vegetable oil - 5 percent. Only components such as salt, soda, fodder lime are 100 percent provided by domestic enterprises. The remaining components are 100 percent satisfied through imports.

Based on the high cost of feed in the production of eggs, it is advisable to use innovative feed at poultry enterprises. "Natresorb" is a feed additive. To assess the effectiveness of the use of "Natresorb" in the feed of birds, an experiment was carried out at "PARRANDA KOMPLEKS SAVDO LLC". The duration of this experiment was 60 days, 1.5 kg of Natresorb feed was added to the diet of birds aged 8-9 months and the number of 34270 heads of the Loman cross. Its economic efficiency due to the addition of "Natresorb" to the poultry feed was carried out at the expense of the produced eggs. According to him, the feed consumption per egg for an experimental chicken was 99.1 percent compared to the control base, 449.3 soums were spent on feed.

According to the table, the average cost of one egg on the experimental base is 660 soums, which is 99.4 percent compared to the control base. On the experimental base, income from eggs amounted to 4935.8 million soums, which is one percent more than in the control base. The level of profitability also amounted to 16.3 and 17.0 percent, respectively. As a result of the application of "Natresorb" in "Parranda kompleks savdo" LLC, one can see an increase in the total number of birds by 0.7 percent, and poultry productivity - by 1.1 percent. Therefore, the use of this feed additive in other poultry farms helps to increase the economic efficiency of enterprises.

It is also advisable that the stages of development of innovative activity will be implemented through the emergence of ideas, innovative marketing, evaluation of the implementation of an innovative project, research and development work, development of innovations, production of innovative products and consumers.

In the course of the study, using the results of the application of the Natresorb feed additive and historical trend data until 2021, the volumes of growing poultry products in our country for the future were calculated.

Conclusion. Innovation is an innovation that has become the result of the achievements of scientific and technological development and has been repeatedly tested in production, ready for mass use and active participation in the innovation market. A distinctive feature of innovation as a commodity is the ability to commercialize an idea, since not all ideas become innovations.

Innovative activity should be studied as a system

References:

1. https://www.fao.org/3/i7465e/i7465e.pdf.

32

2. Decree of the President of the Republic of Uzbekistan dated February 7, 2017 PD-4947 "On the Action Strategy for the Further Development of the Republic of Uzbekistan": 2017. - art. 112.

3. Rakhmataliyev M. Innovative development at poultry enterprises in conditions of globalization of agricultural markets in Uzbekistan . // Bulletin of science and practice, 2018. - No7.

4. Rakhmataliyev M. Current status and investment power of investment in poultry development in Uzbekistan. – International Journal for Innovative Engineering and Management Research. – Volume 10, Issue 03, 2021. – p. 483-485.

5. Rakhmataliyev M. Development of the poultry industry on the basis of innovative activities // Modern scientific challenges and trends: a collection of scientific works of the International scientific conference (7-9 April, 2021) - Warsaw: Sp. z oo "iScience", 2021. Part 2 - 230 p. 6. Umarov S.R., Rakhmataliev M.E. Problems and ways of development of quail farming in the poultry industry of Uzbekistan. - Journal of "Sustainable agriculture", 2021. – № 2(10).

of measures in relation to poultry enterprises aimed at improving the quality indicators of poultry products for the future, creating, implementing, mastering and commercializing inventions aimed at expanding volumes and economic indicators.

The process of introducing innovation into a poultry enterprise is the stage of obtaining information about the novelty being introduced, analyzing the novelty and its features, determining the place of the poultry enterprise in market competition during the implementation of an innovative project, implementing measures to introduce the novelty and mass introduction of innovations at poultry enterprises.

The effectiveness of innovative activities at poultry enterprises should be assessed in the technical, technological, organizational, economic, sociopsychological, natural-climatic and environmentalepidemiological directions. The effectiveness of the innovative development of a poultry enterprise is assessed through technical, economic, social, resource and environmental efficiency.

Evaluation of the efficiency of poultry enterprises in such areas as production resources, economic and financial condition of the enterprise, market and marketing activities, social and environmental.

CREATING OPPORTUNITIES FOR THE DEVELOPMENT OF PUBLIC-PRIVATE PARTNERSHIPS FOR IRRIGATION IN UZBEKISTAN

G.D.Dusmuratov Candidate of economic Sciences, associate Professor of the Department of Economics, "TIIAME" NRU

Q.Utegenov Assistant, Karakalpakstan Institute of Agriculture and Agro technologies

Abstract

The Republic of Uzbekistan has set an ambitious goal of developing PPPs in the irrigation sector. This article examines the various PPPs and the advantages and disadvantages of each for a specific purpose. It reflects the international experiences of PPPs in the field of irrigation and relevant recommendations that can be drawn from them for Uzbekistan.

Keywords: public-private partnership, irrigation sector, public partner, private partner, PPP agreement, potential investors, clusters.

Introduction. In order to successfully apply Public-Private Partnership (PPP) in the field of water management of our country, it is necessary that not only service users are in favor of attracting a private partner, but also that both state and local authorities realize the need for cooperation with the private sector. Otherwise, it is impossible to implement some project on the basis of PPP. Because water consumers and the private sector are directly involved in the management of water infrastructure facilities. This allows management to be organized in accordance with the requirements of the site and it has a positive effect on the very efficient and economical use of water, unlike the methods of managing the water infrastructure that were previously applied uniformly for the entire region.

Therefore, the use of various mechanisms of PPP in water management allows, on the one hand, to increase the efficiency of the use of water resources in agriculture, and on the other hand, to strengthen the trust between business and the state. This is an important condition for the formation of objective opportunities for the sustainable development of the economic activity in question. From this point of view, the PPP implementation process approach has five main elements (Figure 1):



Figure 1. The process of implementing PPP projects

agree on the type(s) of PPP. Review the government's goals for PPPs, consider what challenges they pose to the country, and assess the appropriate form of PPP contracts based on these factors;

- identifying opportunities for PPPs in the irrigation sector of Uzbekistan, taking into account different situations and needs;

defining project selection criteria and starting

project preparation;

actively work to identify potential private partners that meet project criteria and ensure their interests;

in addition to the above, making sure that the key elements of creating a favorable environment for PPPs are in place and making necessary efforts to create a positive environment for private sector participation.

These processes can be done sequentially. However, they should be integrally related to each other and not free of some repetitions. For example, consideration should be given to ensuring that each is compatible with the other and how to adapt each to other processes as they develop. Creating a comfortable environment should be started sooner, because it is likely to take the longest time. But in creating this investment environment, it is important to be aware of what kind of projects and partners are intended for.

Choosing a PPP contract. Different types of I. outsourcing and PPP contracts can be evaluated based on how well they align with each of the government's key objectives for PPP initiatives.

Identify opportunities for PPPs. Opportunities II. and options of PPP should be suitable for conditions in Uzbekistan. The table below (Figure 2) summarizes the different situations.

Discussion. In summary, the best current opportunities for PPPs in irrigation can be found in the following 5 categories:

management а Service and contracts for rehabilitation and partial modernization of existing state irrigation systems, should aim to improve the efficiency and financial sustainability of existing irrigation systems in order to lay the groundwork for later introduction of more advanced forms of PPPs (lease, concession, full nationalization). There may be a case for this among cotton textile clusters and other such agro-processing companies interested in improving the management and facilities of public irrigated areas supplying water to their industries. Another option is that cluster companies can lease public irrigation systems in their areas. Service and management contracts may also apply to multi-crop farms.

Enhanced procurement engineering/design, b. and construction or ready contracts for accelerated modernization of existing public irrigation systems to cover joint contractor-government activities and study period for the upgraded system.

Figure 2. Analysis of opportunities for PPPs in the irrigation sector of Uzbekistan

8	International	Comments on accentability in the conditions
Category	examples for PPPs	of Uzbekistan
1. Component of the multi-purpose water management project	Few	Could be a transboundary upstream project (hydropower, drought water storage, flood control, urban, irrigation, etc.). It provides a large amount of "public benefit" that essentially requires state funding.
2. Creation of new irrigation systems	Peru's Diamond Project	From the identification of new economically irrigable land and, more importantly, the availability of water supplies (e.g. water saved from existing systems)
 Creation of new independent water sources and water transportation facilities (including pumping facilities) to supply water to existing irrigated areas 	Morocco's Gerdan, Egypt's West Delta projects. Most examples of PPPs are in the renewable energy and wastewater treatment sectors (e.g. small hydro in India, Nepal).	It is unlikely that new large water sources and water transportation facilities will exist in Uzbekistan, only existing water can be diverted from economically unproductive areas. Possible options: i) Build more efficient pumping stations, including solar-powered pumps or small hydroelectric systems where electricity is sold to irrigation agencies;
		ii) Treatment and transportation of treated wastewater for agricultural use m pen-taban areas
Improvement of existing infrastmetures, modernization and reconstruction and automation, operation and minimutenance (O&M) and integration services in existing farm areas S Private agro-industrial companies are undertaking to build new mingation systems on	Ethiopia: Megech Scraha Mukhuri project of Banglačesh Judva: Karnataka (Naruyanpur) Pern's Diamond Project	Unless special measures are taken to mitiggine demand, water supply and other trednical roles they create unarractive profileloss ratios that make PPPs less attractive to leases or concessions. However, there are opportunities to ende into initial service contracts for specially targeted capital invastments and management contracts for operation and maintenance to restore failed systems before leasing or establishing concessions. Traditional project engineering/design, procuement and construction contracts and off- he-shelf construction construction contracts and off- he-shelf construction construction contracts. Any PPP in this category mode financial support from the government and/or development and horiculture) under special PP-type contracts and horiculture) under special PP-type contracts and horiculture) under special PP-type contracts with acceptable legal condutors that method
manage existing ones to expand or protect their value chains.		relations with water user associations (WUA), non cluster farmers and other users (for example, villages) relying on the common water source, may be internating for Water rights and service levels should be clearly defined for the cluster and other water consumers.
 Restoration of irrigated lands in very poor condition (for example, saline). 		There are two possible options: Provision of recovery, exploitation and return contracts and generations substitles in view of high cost reoutiensents. Olice engineering/design, producement and construction of the project contracts and service or management arrangements until land productivity; is restored.
7. Renoval of local irrigation systems transforred to water user associations	The experience and obligations of Turkey, Mexico and other countries show that mcreasing the financial espacity of associations is effective in cases where water consumors are transforred to associations.	The transfer of supply, rights and obligations in agricultural irrigation systems to WUA may have the same effect as the privatization (exprepriation) of local state irrigation facilities. There may be a need to change the legal status of WUA, for example, to convert them into farming cooperatives.

c. Restoration, exploitation, and return contracts are contracts that can be offered to restore the productivity of irrigated land that has fallen into a very poor condition (eg, salinity).

d. Provision of recovery, exploitation and return contracts are needed to provide ancillary irrigation services (such as replacing pumps in main systems, solar-powered or small hydro pumping units;) or to deliver treated and treated wastewater to peri-urban agriculture.

e. Transfer of state irrigation facilities to WUA in farms growing diversified crops.

To attract private partners, the above-mentioned opportunities should be identified and effective measures should be implemented.

IV. Choosing a project and preparing it. As a result of the processes presented in sections I and II above, it is necessary to determine the current situations that can be offered to outsourcing and other types of PPPs in the irrigation sector of Uzbekistan, and to make decisions about the most suitable types of contracts for them. The next step is to identify and prepare specific projects in which private partners can be invited to participate.

V. Attracting potential private partners. The

"market" for irrigation PPPs is not large, and companies with sufficient experience, capacity, and especially the desire to invest in this specialized and risk-based asset class are relatively rare. Several planned PPPs have failed at the last stage due to insufficient interest from bidders.

The following constitute the target group of potential investors or partners for PPPs:

> Consultants and service companies specializing in management and problem solving in: situations like those in Uzbekistan. Such firms should be prepared to implement a hands-on approach;

> Agricultural/food processing companies willing to "re-integrate" into irrigation to secure their value chain. This includes cotton textiles and other "clusters".

> There may also be larger agricultural and food processing companies willing to invest in new irrigation systems in a joint venture with the state.

> Irrigation technology and equipment suppliers with system-wide experience under engineering/design, procurement and construction contracts or ready contracts (eg from Israel, Australia, India and elsewhere) are extended to include technical assistance, training and other support for several years after project completion.

> Suppliers and operators of acceptable scale conventional and renewable electricity sources (including small hydro or solar power) operating on the basis of provision of recovery, exploitation and return contracts.

> Provision of recovery, exploitation and return contracts for the treatment and recycling of wastewater to peri-urban rural irrigation systems for agricultural use (using biogas as a potential by-product).

VI. Creating a favorable environment for PPPs in the field of irrigation. Supporting an enabling environment for PPPs has implications for many aspects of national government.

Conclusion and suggestions. Studying the above program based on the existing investment climate for PPPs in Uzbekistan and special reference to the following:

- Adapt existing legislation on PPPs to meet the needs of the irrigation sector, including developing regulatory and legal processes appropriate to the potential role of clusters.

- Establishment of Single Window Unit for PPPs in order to ensure effective implementation of legislation on PPPs.

- Develop templates for irrigation PPP contracts that can be adapted for specific situations.

- In order to maintain the confidence of investors, the general public and the end users of PPP services, PPP contracts are required to have an independent system of monitoring and regulation. Alternatively, both parties may apply to the court to resolve disputes arising from the performance of the terms of the contract. These provisions and jurisdictions are required to be part of the PPP agreement.

- Special relaxations of land ownership and land use rights may be required to cover PPPs involving the temporary lease or ownership of land or irrigation infrastructure, and may also affect the transfer of facilities to WUAs and other forms of full privatization.

- In order to provide certainty and certainty to PPP contractors involved in public surface irrigation, regulations regarding the withdrawal and use of seepage water may need to be revised.

- It is particularly important to prepare specific contract templates for irrigation PPPs that include the scope of the contract (eg, infrastructure boundaries, water

used for desalination, extent of drains) and ownership of the water it provides. Allocation of responsibilities for undertaking and mitigating individual risks should also be included as standard. In order to protect the position of "third-party" farmers who depend on the irrigation system, but do not sell products to the cluster, assuming that the cluster companies are among the target group of potential partners, the contract projects should also include clauses regarding the establishment of a close relationship between the cluster companies and the project organization.

- Clarification is required on the future development of rates and charges for Water Tax and Irrigation Services.

- Private contractors and investors should have access to suitable sources of financing for their enterprises. Local currency financing is required from either state or commercial banks (or both), while longerterm and larger loans from international development partners must be supported by the government providing the necessary guarantees. The state budget should provide for the allocation of the same amount of funds for the expenses of operation and maintenance and PPP contracting partners of the irrigation sector.

Ongoing agricultural policy reforms should be continued to promote market relationships that make irrigated agriculture more profitable and improve water productivity.

References:

1. Resolution of the Republic of Uzbekistan dated February 24, 2021, No PR-5005 "On approval of the strategy for the management of water resources and development of the irrigation sector in the Republic of Uzbekistan for 2021-2023". https://lex.uz/docs/5307918 .

2. Umurzakov U.P., Dusmuratov G.D. "Public-private partnership in agriculture and water management". Textbook. - T: 2019. - 288 page

3. Tokhirov J.R. "Principles of organization and development of public-private partnership and their specific features in the educational system", "Economics and innovative technologies" scientific electronic journal. No. 4, July-August, 2021. 4/2021 (No. 00054) http://iqtisodiyot. tsue.uz 211.

4. "What is being done in the implementation of public-private partnership projects in water management facilities?" // https://xs.uz/uzkr/post .

5. Imomov N. (2018). "Legal bases of public-private partnership. Uzbekistan Legislation Review", (4), 23–26. retrieved from https://inlibrary.uz/ index.php/uzbek_law_review/article/view/12893.

6. Land for rent. https://urmon.uz/uz/3780.

7. E. Yescomb "Public-private partnership. Basic principles of financing" M.: Alpina Publisher, 2015. - 411 p.

8. Guidelines of the United Nations Development Program "Toolkit on Pro-poor Municipal PPP". [Electronic resource]. - Access mode: http://pppue.undp.org/toolkit .

9. "Public-Private Partnership: Theory and Practice", Tutorial. (V.G. Varnavsky, A.V. Klimenko, V.A. Korolev). https://economics.vstu.by/wp-content/uploads/2020/03/GCHP varn.pd.

10. Shokhin A.N., Oganisyan S.O. "Public-private partnership as a tool for the development of interaction between business and the state" JOURNAL "BUSINESS. SOCIETY. POWER". September 2020. No. 2-3 (36-37) https://www.hse.ru/data/2020/09/15/1583184300.

11. Borshchevsky, G. A. "Public-private partnership: textbook and workshop for undergraduate and graduate students" 2nd ed., revised and supplementary. – M.: Yurayt Publishing House, 2018. - 412 p. — (Series: Bachelor and Master. Academic course).

12 L.A. Tolstolesova "Public-private partnership in the context of digitalization of the economy": - Monograph; [ed.]. - Novosibirsk: Ed. SibAK LLC, 2020. - 216 p. https://sibac.info/sites/default/files/files/ mono/GPUCE.pdf?ysclid=lbzbj3l3ts289412111 .

13. UNECE "Practical guidance on the issue of effective management in the field of public-private partnership" [Electron. resource], Geneva, 2008 - Access mode: https://www.unece.org/fileadmin/DAM/ceci/ publications/ppp r.pdf.

14. A.G. Zeldner, I.I. Smotritskaya "Public-private partnership in the conditions of innovative development of the economy" [Monograph] / Ed. M.: IE RAN, 2012. S. 212.

15. Fadyushin I.S. "International experience in the development of PPP", International research journal. No. 4 (82). Part 2. April. 2019/04/25. https://research-journal.org/archive/4-82-2019-april/mezhdunarodnyj-opyt-razvitiya-gch.

AN INNOVATIVE APPROACH TO AGRICULTURAL DIVERSIFICATION

Sukhrob Umarov, Akmaljon Berdimurodov – "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

Abstract

The purpose of the study is to substantiate the theoretical and methodological provisions and develop practical recommendations for the development of agricultural diversification. In accordance with the goal, the following tasks were set and solved: - to explore the economic essence and content of the diversification category; explore the multifunctionality of rural areas; identify the features of the development of rural diversification; substantiate the conceptual approach to the formation and development of diversification. Keywords:**diversification, agriculture, development, innovative approach.**

Introduction. One of the priority strategic tasks aimed at reducing the high spatial differentiation of agriculture is their diversification, carried out through the involvement of unused resource reserves in the turnover and the development on this basis of industries whose products have a steady demand in the market.

In recent decades, rural areas, despite the progress made in agricultural production, are facing new socio-economic and environmental problems. Agriculture is, in its essence, a life-supporting sector of the national economy and contributes to the improvement of the country's food security, but its role has noticeably decreased over the years of reforms in the economy of Uzbekistan.

The general structural crisis has led to a decrease in the number of jobs not only in agriculture, but also in industry, and the service sector is not developing so dynamically as to provide rural residents with places for the released workforce. At the same time, agriculture continues to be a backbone sector of the rural economy.

In this regard, in solving the identified problems, the transition of rural areas to the path of diversified development and the creation in the countryside of the maximum possible variety of economic forms and activities, the integrated use of the resources of the territory and the employment of the rural population are of particular importance.

Materials and Methods. The theoretical and methodological basis of the study was the works of foreign scientists, legislative and regulatory acts of the Republic of Uzbekistan; policy documents of state, regional and local authorities in the field of diversified development of rural areas. In the process of research, general scientific methods of theoretical and empirical knowledge were used: the dialectical method of economic and social processes, deduction, decomposition, calculation-constructive, monographic, formal-logical; as well as economic and statistical methods, including system analysis and economic comparison.

Literary review. The economy of sustainable development is a modern economy that requires not only investments or new technologies, but also innovations that allow expanding methodological and social approaches when changing priorities and goals for the development of society, i.e. diversified direction of development. The effective use of this area by the authorities is, first of all, connected with the solution of a number of practical problems linking the analysis of the conditions and factors of diversification and the dynamics of economic development, as well as the identification and systematization of the advantages and resource potential of the regions. First of all, this is relevant for the branches of the agro-industrial complex, on the one hand, having large untapped resource reserves, and on the other hand, characterized by a stable market demand for manufactured products. Along with this, the ongoing negative processes in the demographic and labor spheres of rural areas have to a large extent influenced the creation of a new, socially oriented, diversified model for the development of rural areas, contributing to the integrated use of resources and improving the living conditions of rural residents.

It should be noted that when studying the processes of rural diversification, neither domestic economic theory nor empirical research provides us with the necessary, reliable and complete information, therefore, we will, first of all, be based on the world experience known in Uzbekistan. And this is not accidental, since in foreign and domestic literature there are no sufficiently clear definitions of the process of diversification itself.

The idea of diversification, according to B. Karloff, has a long history, starting its formation in the late 60s - early 70s, after which, due to the globalization of economic processes, it was replaced by ideas and judgments about the importance and necessity of developing the main areas of business. If R. Pits and H. Hopkins consider diversification as a process of simultaneous functioning of several types of business [1], then Alain, Booz and Hamilton define it, first of all, as a way to expand a business, the main purpose of which is its growth and (or) risk reduction [2].

Economic Research by A. Thompson Jr. and A. Strickland are devoted to a deeper understanding of diversification, in which its purpose is associated not only with reducing risks depending on one industry, but also with obtaining additional profit due to the fact that the main industries of the company do not bring the necessary profit for its further development [3]. Therefore, in general, the works of these scientists associate diversification with the process of firm penetration into other industries. Economic literature in its arsenal also has many definitions of the concept of "diversification", which in the process of historical development has changed and been detailed. This can be explained by the fact that diversification, by its very nature, represents various processes, and therefore it is necessary to recognize and interpret their purpose in accordance with their studies related to rural development. Let us turn to the etymology of the word "diversification". Its Latin basis includes different semantic content: on the one hand, "diversificatio" literally means "change, diversity", and on the other hand, its main components "diversus" – "different" and "facio" – "I do" emphasize the plurality of activity, actions, classes. If we consider the concept of "diversification" at the most general level, then
it essentially means "going beyond the usual", some form of improvement. In this interpretation, the meaning of the concept close in essence to the content of the concept of "comprehensive development", which is widely used in classical political economy and modern economic theory. Considering diversification from an economic point of view, one can notice a general direction associated with the expansion of economic activity into new areas. It can include a wide range: from increasing the range of products and services to various fields of activity [4]. Most scientists define diversification as the spread of activity of various organizations and entire industries beyond the core business, which, in the process of producing goods and services, has the maximum shares in net sales along with other types of manufactured products [5].

In the economic literature, diversification is defined as:

- diversification of loans - the distribution of capital invested in the economy between various objects to reduce risk and obtain high incomes;

- material diversification - the development of new forms and areas of activity;

- diversification of production - the development of new types of production and expansion of the range of products to obtain economic benefits and increase efficiency, as well as to prevent bankruptcy [6].

Despite the fact that there are various interpretations in the literature based on studies of the purpose of diversification of the regional economy, they mainly associate the development of diversification with an increase in the competitiveness of the region.

So, in most publications that deal with diversification issues, the term itself for the most part characterizes the measure of diversity in the aggregate: diversification increases with greater diversity. As a result, the category "diversification" is ambiguous and its interpretation can be both in a broad and narrow sense. In both cases, the main content of diversification is its connection with a change in the range of goods produced and services provided, the expansion of economic activities and the development of new industries, the improvement of product quality, which ultimately leads to an increase in competitiveness, efficiency and strategic sustainability of the economy, the development of human capital.

Results and analysis

Based on the variety of approaches to the interpretation of diversification, it is clear that it is a combination of various phenomena and processes aimed at using the existing potential and achieving the goals (Fig. 1).

EXISTING APPROACHES TO THE INTERPRETATION OF THE CATEGORY "DIVERSIFICATION"
 State policy related to the creation of a modern structure of the national economic complex; expanding the spheres of economic activity in order to increase the contribution of new types of industries and services to the socio-economic development of the territory, accelerate economic growth and improve the quality of life of the population on this basis; diversified development, distribution of invested monetary capital between various investment objects in order to reduce the risk of possible losses of capital or income from it; process and form of social organization of production; a way to expand the range of products and services provided, and change the organizational structure of the enterprise; complex diversified development; a way to cover new territorial markets; expanding the range and modifications of the same products to increase interest in them among traditional buyers.
Figure 1 - Systematization of approaches to the
study of the category "diversification" *
* Source: compiled by the author according to [11]

12; 13; 14; 15;16] With regard to our research topic, the main approaches are: expanding the spheres of economic activity in order to increase the contribution of new types of industries and servants to the socio-economic development of the territory, stabilizing and increasing economic growth and improving the quality of life of the population on this basis, and integrated diversified development [14; 15; 16].

The main reasons for the emergence and development of diversification can be considered as follows: uneven development of economic sectors; falling profit margins in traditional production; development of scientific and technological progress; acquisition of economic stability and competitiveness; gaining a larger share of the market of their own product and other markets; improving the welfare of the population. The diversification of the economy in its historical development has gone through several stages: horizontal diversification (a set of activities within one production cycle); product diversification (a set of similar products, when a minor modification is made to an old product to obtain a new product, without significantly affecting production processes); vertical integration, industry diversification (a set of industries), diversified diversification (a set of industries and fields of activity); geographic diversification (set of countries, local entities); international diversification with its various stages depending on the coverage of the world market, internationalization of production; global diversification.

Diversification can be carried out by creating a new production in another industry, that is, developing from closely related activities to less related types. There are two main types of diversification: related - the emergence of a new area of activity associated with existing business areas (less risky) and unrelated - the emergence of a new area of activity that does not have obvious connections (more risky) [7].

The first type of diversification is associated with a change in market conditions and the industry where the enterprise operates. In this case, the connectedness manifests itself when focusing on a certain type of final product in the chain "supplier - consumer". Some experts call this type of diversification synergistic because of the synergistic effect [8].

In related diversification, vertical and horizontal integration are distinguished, the first is due to the technology of production and sales, and the second is the release of new products.

In the process of developing related diversification, questions arise about the method of diversification: to develop new areas of activity at the expense of internal resources (internal expansion); or acquire a readymade company (merger and acquisition). Unrelated diversification (conglomerate) is a transition to an area that is not directly related to the firm's business, new technologies or market needs [9].



Figure 2 - Various forms of links, including the main types: horizontal, vertical and cyclical diversification. The basic regulations that establish the goals and principles of rural development in Uzbekistan are various legal acts, among which we note concepts, strategies and state programs.

In these documents, diversification is aimed at ensuring sustainable socio-economic development of regions and smoothing their differentiation. Rural diversification aimed at satisfying the needs of the rural community through the organization of various economic forms and activities in the countryside was named among the main target areas that contribute to ensuring employment of the rural population and improving the quality of their life.

In order to improve the efficiency of managing diversification processes in rural areas, it is important to take into account that diversification is associated with the organization of diversified production and the dispersal of capital, the ultimate goal of which is to meet the constantly changing needs of society in the goods produced and services provided. In this regard, the features of the diversified development of rural areas are determined, based on an integrated and interconnected approach that considers development in three dimensions: formation (resources), development (change) and use (opportunities). As a result of summarizing the opinions of scientists, we conclude that the category "rural territories" is primarily spatial, but it still needs to be considered in various aspects according to the emerging need - in geographical, economic, social, cultural, etc.

Discussion. When studying diversification, we considered various theories (concepts), stages, conceptual apparatus, which were systematized and, in fact, were the main elements in substantiating the theoretical basis of the study, which made it possible to clarify the concept of "diversification of territories" as an expansion of economic activities and an increase in the contribution of new types to its socio-economic development in order to increase competitiveness and improve, as a result, the well-being of the population (Fig. 3).

Theories (concepts):

- spatial development;

- regulation of spatial development;

- sustainable development;

- social development;
- economic growth and development;
- territorial development;
- territorial development;
- comparative and competitive advantages;
- public theory of self-management and social
- service.

Stages of diversification:

- horizontal diversification;
- commodity diversification;
- vertical diversification;
- diversified diversification;
- geographical diversification;
 international diversification;
- integration diversification;
- global diversification.
- Broom diversification.

Conceptual apparatus:

Approaches to the interpretation of the category "diversification": - as a state policy aimed at creating a

as a state policy aimed at creating a modern structure of the national economic complex;

- as an expansion of the spheres of economic activity in order to increase the contribution of new types of industries and services to the socioeconomic development of the territory, accelerate economic growth and improve the quality of life of the population on this basis;

- as a way to expand the range of products and services provided, as well as modify the same product to increase interest in it among buyers.

the quality of life of the rural population, we have defined the goal, objectives and identified features, prerequisites and constraints that determine the content of the diversification of rural areas.

The main goal of the diversified development of rural areas is to achieve their economic sustainability and stability, as well as to improve the quality of life of the villagers, and the prerequisites are a decrease in the number of the rural population and its level of income, a deterioration in the demographic situation, an increase in unemployment, a low level of development of social and market infrastructure; uncontrolled spending of natural resources available on the territory, depopulation of territories.

Ireland and Finland can be considered as an alternative model for economic diversification. Ireland was not among the industrialized countries of Western Europe, developing the branches of the agro-industrial complex to a greater extent. For 10 years, as a result of the ongoing economic policy, carried out in three areas: fiscal stabilization; openness of trade and investment regimes; active structural policy, there was a significant change in the structure of the economy.

According to the subsidiarity principle, the policy of diversifying rural areas in the USA, France and other countries is being built to support organic agriculture [10] . It is well known that the production of environmentally friendly products involves high costs, which is reflected in its final cost. Therefore, in developed countries, agricultural policy is gradually becoming environmentally oriented. State support for agricultural producers includes various instruments: subsidies, soft loans, the complete abolition of taxation of entrepreneurial activities in rural areas.

In Norway, the priority care of the state for dehkans, which is considered an absolute value, is carried out. This country takes into account the difficult working

conditions in harsh climatic zones, supports active life in rural areas, and produces environmentally friendly and safe products.

As in many European countries, in the UK, the standards for providing the rural population with public services are applied, the achievement of which is controlled by British ministries and departments. If they are violated, then any villager can go to court with a complaint against the government.

In Sweden, the development of rural areas is directly related to cooperation in the countryside, which has become a form of cooperation between producers, primarily farmers. In world practice, during the restructuring of the rural economy, agritourism is actively spreading, which allows you to transfer labor resources to another industry and create new rural jobs. If we look at the statistics, in Austria, agritourists

Figure 3. Block diagram of the theoretical foundations of diversification Source: compiled by the author [14; 15; 16].

Based on the principles of system analysis, which allow us to consider the rural area as a complex hierarchical structure, the functioning of which is aimed at improving accounted for 16% of the total number of rural tourists in the EU, in France - 15%, in Italy - 13% and Spain - 8%. Spain has over 5,000 different rural holiday options and hosts almost 27,000 agritourists at any one time. In France, monasteries, inns, historical castles, and estates have been given over to rural hotels.

Italy is characterized by the specialization of wine and gastronomic tourism. The owners of agrocottages offer guests a variety of products from cheeses, meat products, olive oil, asparagus and homemade noodles with porcini mushrooms to entire wine cellars.

Important in the development of agritourism in Germany is the support at all levels of management, provided in the form of direct financing of entrepreneurs involved in the industry. Along with direct support for agro -tourism , indirect support is widespread - in the form of various programs for the development of rural areas and agriculture, economic and socio-engineering infrastructures.

In Poland, those wishing to engage in rural tourism are registered with local governments (without licensing) and if the farm provides guests with at least five rooms, they do not pay taxes. Rural tourism in Polish legislation is given a significant place and the basic concepts and principles of its management are clearly defined among other types of tourism services and entrepreneurial activities in the countryside. International practice shows that rural diversification is gaining momentum more and more, and each country has its own specifics and directions, determined by the diversity of the structure of the economy.

Summarizing the above, we present the main theoretical provisions of the diversification of rural areas, based on the following postulates:

1. For the development of rural areas (their multifunctionality and new types of activities), it is important, on the one hand, to take into account large untapped resource reserves (nature, land, labor), and, on the other hand, a steady demand in the market (food, various services, including and social).

2. Studying the organizational and economic foundations of the diversification of rural areas, it

is necessary to substantiate the prerequisites for the transition from a one-sided structure of the rural economy to a diversified one through the development of new types of activities and a more rational use of available resources.

3. In modern conditions, the social sphere affects the reproduction of the labor force and has a significant diversification potential for the development of new types of economic activity - as social services for the rural population and focused on meeting their needs.

4. Diversification, along with a change in activities, requires appropriate changes in organization and management, as well as information and infrastructure support, including consulting, business planning, marketing research.

5. There is a need for a unified mechanism for the diversification of rural areas, which will ensure a real multiplier effect from the use of the economic resources of the territory, competitive advantages, and, ultimately, improve the standard of living of the population.

Conclusion. Thus, concretizing the above, it is possible to define the diversification of rural areas as a continuous process aimed at creating various forms and types of economic activities in rural areas, the integrated use of the natural resource potential of the territory, which, in turn, determines the possibility of restructuring the rural economy, providing employment rural population and improving their quality of life.

References:

2. Abramov, L.A. Theoretical approaches to the diversification of economic systems / L.A. Abramov // Economic analysis: theory and practice. - 2009. - No. 28. - P.37-42

3. Thompson, A.A. ml., Strickland, A. J. Strategic management. The art of developing and implementing strategies / transl. from English. ed. L. G. Zaitseva, M. I. Sokolova. Moscow: Banks and exchanges; UNITY, 1998 4. Markova, V.D. Strategic management / V.D. Markova, S.A. Kuznetsova. - M.: INFRA-M, 1999. - S. 153.

- 5. Nemchenko, G. Diversification of production: goals and directions of activity / G. Nemchenko, S. Donetskaya, K. Dyakonov // International journal "Problems of theory and practice of management". 1998. - No. 1. - S. 81-85.

6. Kundius, V.A. Development of methodology and calculations of household income, microcluster of rural areas / V.A. Kundius , N.I. Petsukh, E.Yu. Domnikova, A.N. Kharchenko //Bulletin of Altai science. - 2014. - No. 1. - P. 80.

7. Gorshkov, V.G. Diversification at an industrial enterprise / V.G. Gorshkov, A.D. Markova and others. Barnaul: Ed. Alt. GTU, 2000. - 191 p. 8. Japanese economy on the eve of the XXI century. M.: Nauka, 1991. - 397 p.

9. Polidi, A.A. Diversification as the dominant basic strategy for the development of Russian industry in the context of globalization of economic relations / Abstract of the dissertation for the degree of Doctor of Economics. Vladikavkaz, 2006.

10. Petsukh, N.I. Increasing the organizational and economic potential of sustainable development of rural areas (on the materials of the Altai Territory): dis. ... cand. economy. Sciences. - Barnaul, 2016. - 162 p.

11. Abramov, L.A. Theoretical approaches to the diversification of economic systems / L.A. Abramov // Economic analysis: theory and practice. - 2009. - No. 28. - P.37-42

12. Dondokov, B.B. Formation of a tourist and recreational cluster as a way to diversify the regional economy // B.B. Dondokov // Problems of modern economics. - 2010. - No. 3 (35). Access mode: http://www.m-economy.ru/art.php?nArtId=3280

13. Uskova, T.V. Diversification of the regional economy is the most important condition for increasing its competitiveness / T.V. Uskova, S.S. Kopasova. – Access mode: http://journal.vscc.ac.ru/php/jou/40/art40 03.php

14. Chub, A.A. Reflection of the imbalance of the social and economic components of the development of the regional system in modern statistical indicators / A.A. Chub, A.A. Miroedov // Questions of statistics. - 2009. - No. 10. - S. 62-66.

15. Shakirov, N.Sh. Diversification of the Russian economy: some aspects of theory and practice / N.Sh. Shakirov [Electronic resource]. -Access mode: http://tisbi.ru/science/ vestnik /2004/issue3/ Econom14.html

16. Shniper, R.A. Region: economic methods of management / R.A. Schniper . - Novosibirsk: Nauka, 1991. - 81 p.

^{1.} Pitts RA, Hoprins HD Firm diversity: conceptualization and measurement // Academy of Management Review. 1982. No. 7

DIRECTIONS OF STATE SUPPORT FOR THE DEVELOPMENT OF THE CULTIVATION SYSTEM OF HORTICULTURE PRODUCTS

U.Alimov - PhD student of "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

M.Kholikulov - PhD student of "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

Abstract

This article explores using digital technologies in the horticulture network, the creation of trading platforms, the construction of a closed system and the layered subsidization mechanisms for the production of horticulture products. This article presents proposals for the introduction of market mechanisms of support in the development of the horticulture network.

Keywords: agricultural enterprises, sustainable development, horticulture industry, state support, economic efficiency, agribusiness environment.

Introduction. Based on the specific characteristics of the agrarian sector, it should be noted that support is sometimes required for agrarian entrepreneurs to start their own business, for poor agricultural enterprises to "stand on their feet" and to enter new export markets. This will eventually lead to the creation of new job places and an increase in the income of the population. For this purpose, a number of benefits have been introduced in our country in recent years. In 2021, the total volume of the revised benefits was 51 trillion soums. As a result, 170,000 new business entities were opened last year, and more than 500,000 job places were created.

It is known that the comprehensive reforms of state support for agriculture have been carried out in recent years, and in 2017-2022, a system of providing more than 84 types of subsidies, as well as tax, credit and customs benefits, was created in the areas and branches of the agricultural sector. In order to simplify the procedures for allocating subsidies, create a favorable environment for their use, reduce administrative and documentationrelated obstacles, and cover all layers of producers, emphasis is placed on the distribution of subsidies to 18 ministries and agencies based on the proposal of their regional departments. At the same time, in order to ensure the transparency of the state support system, a special platform was established under the Ministry of Finance, as well as special platforms in relevant ministries and agencies. It has provided facilities such as fast, transparent, open and real-time operation for the benefit users.

In general, the market mechanisms of state support of the agricultural sector are slowly being fully implemented, and at the current stage, it is being improved in certain directions, in particular, in the section of products. According to researches, today the main directions of state support for agriculture are as follows. In particular:

In the direction of production organization:

- support for the equipment of warehouses, drying, sorting, packaging for business entities that have established work on the basis of cooperation with landowners ;

- preparation of technical and economic feasibility study of newly established promising projects for the production of food products ;

- compensation of a part of transportation costs when exporting products ;

- compensating part of the costs of marketing research in foreign markets ;

- to cover part of the costs related to the

establishment of gardens and vineyards, new modern plantations ;

- creation of a free service system for paid services provided by various government agencies (water resources, meteorological, hydrological and agrometeorological data, registration, approval, licensing, etc.).

The state support of the agricultural sector in the above directions is having its positive effect, it serves to create an attractive investment environment in the sector, the formation of enterprising entrepreneurship, the introduction of new business directions, and the formation of the entrepreneurial culture of the population.

In particular, encouraging the cultivation of horticulture products as ways of ecologically supporting the sustainable development of the horticulture industry in the future; constant monitoring of changes in soil composition, level of pollution and level (volume) of underground water; directions such as optimizing the supply of resources (water, fertilizer, seeds) in adapting to climate changes are proposed.

The experience of developed countries shows that the creation of a favorable agribusiness environment leads to an increase in the flow of investments into this industry. In turn, the investor feels the need for qualified personnel, specialists with the ability to use new technologies. The integration of labor resources leads to the neglect of the labor force with relatively low local skills in the context of free interstate migration. In this case, the social effectiveness of the network development programs will not be evident. Therefore, state support in social directions such as providing the horticulture network with a narrow range of specialists, constantly improving knowledge and skills related to the use of new technologies, and improving social infrastructure facilities is becoming a need of the hour.

Methods. In the research, together with literature analysis, monographic research was conducted in Zomin and Zarbdar districts of Jizzakh region by the method of "face to face survey".

Result and discussion. Economic levers and mechanisms were studied in the studies, with a wider emphasis on the economic directions of state support for the cultivation of horticulture products. Based on the results of surveys and monographic studies conducted in the regions, attention was paid to coordination of problems in the areas of crediting, taxation, subsidization and customs administration, taking into account the practice, researching the scientific basis of the negative situations

40

that afflict producers.

In particular, research conducted in the Zomin district of the Jizzakh region shows that one of the problems that plagues the growers of horticulture products is the lack of working capital and the high impact of natural disasters and force majeure (Figure 1).



Figure 1. Problems related to financing in production of the horticulture products (percentage of total respondents)

Circumstances such as the above do not ensure the sustainable development of the network, creating the ground for agribusiness built on the basis of short-term business plans. Therefore, in our opinion, it is suggested that the state's targeted programs should treat the producers separately, provide them with a 3-month grace period by providing 6-month revolving loans for working capital regardless of the form of business management and the method of production organization, and by increasing the bank loan by the state.

At the same time, one of the main risks in the cultivation of horticulture products is natural disasters (floods, pests, drought, etc.) and negative signals in the foreign market create a high risk. In today's undeveloped agricultural insurance market, non-repayment of loans for working capital endangers normal reproduction in the economy. Researches have shown that in the conditions of high-risk situations in horticulture farms, an average loss of 7-10 percent does not pose a threat to normal reproduction (Figure 2).



Figure 2. What is the highest risk level (percentage of total respondents) for simple replication in production of the horticulture products?

As a result of supporting these cases by covering the part that exceeds the refinancing rate, but not more than 10 points, when the effects of natural disasters, pests, and interventions in foreign markets are observed, it is possible to achieve the organization of production on the basis of medium and long-term business plans of producers.

Land and water tax payment procedures in our country were changed several times during the reforms. In particular, in the early years of independence, there were taxes for using land and water resources, but since 1999, a single land tax has been introduced, which includes 11 types of taxes.

It is known that in developed countries, risks in agriculture are mainly insured through agricultural insurance companies and are covered in the event of an insurance event. In our country, the agro-insurance market is not sufficiently developed, and only "Uzagrosugarta" JSC operates. According to the researches, this insurance company has a very small share of funds allocated directly for crop insurance, and is mainly engaged in the insurance of non-return risks of loans allocated to cotton and grain farms, insurance of agricultural machinery, as well as providing a number of other types of non-agricultural insurance services. There are specific scientific reasons for this, and the fact that farms do not keep indicators such as cost calculations and statistics has a negative effect on mutual cooperation. In such conditions, the only way to encourage the farms that provide agro-insurance services and produce crops is to cover a part of the insurance premium by the state.

A new and popular method of state support for the production of agricultural products is related to the allocation of subsidies, which has been one of the methods that have received the most attention in recent years. However, the allocation of subsidies focuses mainly on introducing new technologies and covering some of their costs.

In developed countries, state subsidies are viewed from the perspective of supporting competition and creating a level playing field for market participants. In our case, on the other hand, a financially stable economy continues to have a stronger segment in the market with the introduction of new technology.

In our opinion, in order to create healthy competition between producers, to ensure equal conditions between them, it is proposed to introduce subsidizing mechanisms based on the location of farms in relation to infrastructure facilities. With the aid of this method, firstly, the ground is created for the efficiently using land in remote areas, and secondly, it allows to operate in a healthy competitive environment due to the reduction of transport costs. Therefore, it is appropriate to subsidize the transport costs (based on the price of diesel fuel) of farms growing products at a distance of more than 50 km from infrastructure facilities.

In turn, one of the main functions of the state is to create a transparent information system for producers and to open the way to the world market by conducting a pragmatic foreign policy. Thanks to the pragmatic foreign policy conducted in our country, the European Commission granted Uzbekistan the status of a beneficiary country under the General System of Preferences (GSP+).

It should be noted that this regime allows national producers to enter the markets of European Union (EU) countries under favorable conditions. Here we are talking about the market of the region with more than 513 million inhabitants. Now the number of goods positions that Uzbek producers can export to EU countries will increase to 6,200. Generally, 0 or reduced tariff is applied under the GSP+ system. Therefore, it is important that each beneficiary country can take full advantage of the opportunity provided by this regime .

Based on the above, there are all conditions for gaining a new segment in the EU markets, taking into account the high potential for growing horticulture products in our country and the high possibility of growing organic products in mountain and sub-mountain regions. For this, it is necessary to encourage the producers of products.

The Law of the Republic of Uzbekistan "On Organic Products" was adopted in our country on April 25, 2022, and Article 12 of it specifies the ways of state support for the organic products sector . Accordingly, the state supports producers of organic products in areas such as certification, introduction of innovative methods and technologies, and service provision. However, in our opinion, specific economic mechanisms are required to encourage producers.

In today's conditions, it is considered one of the acceptable ways to allocate a subsidy corresponding to the positive difference between the domestic market and the EU market prices to farms that grow organic products and export to EU markets. It is based on the average price of one kilogram of horticulture products.

When it comes to the EU, its markets differ sharply from the eastern market, especially the markets of our country. In particular, separate European standards have been established for product sales methods, terms, composition and agrotechnologies. Also, the technologies of providing horticulture products at any time of the year have been effectively put into practice. In this case, the technology of cultivation of horticulture products on protected lands is considered one of the most common methods. The opening of the EU markets to the entrepreneurs of our country under the GSP+ program encourages the introduction of a system of continuous production throughout the year. In turn, the energy crisis observed in the EU in recent years creates problems in the protected land using system. This creates a gap in the market segment and creates a basis for strengthening the position of new participants.

That is why the issue of state support for the continuous cultivation of horticulture products on protected lands throughout the year is considered one of the urgent directions in our country.

In our opinion, organizational, economic, social and environmental incentives can be widely used in the state support for the cultivation of horticulture products in Protected Land Areas (PLA). In particular, as levers of economic stimulation:

- providing tax holidays and credit guarantees for farms that grow horticulture products in the winter and spring seasons;

- In order to encourage the use of alternative energy in PLA, incentives can be given in such directions as covering a part of their costs.

Also, the following levers can be used in the state organizational support for the cultivation of horticulture products in this technology. In particular:

- development of horticulture products cultivation, construction of "In vitro" laboratories;

- to increase the research related to cultivation of horticulture products and train qualified specialists in PLA;

- introduction and guarantee of market mechanisms in providing PLA with continuous energy;

- export of horticulture products in the autumnwinter season, provision of services such as marketing research in foreign markets, etc.

On the basis of the research, it can be noted that the costs associated with the organization of the cultivation of horticulture products on one hectare of protected land area in agriculture, if it is directed to effective export, can

42

fully cover the expenses spent in 5 years, and approximate calculations show that it can slowly enter the profit from the fifth year (Table 1).

Table 1.

Indicators of economic	efficiency	of growing
horticulture products on t	he protecte	ed land area

Ind	icators	Units of measure	Cultivation of horticulture products in PLA
Protected land area		hectares	1
Field planted with hortic	culture products	hectares	1
Average productivity		centner/hectares	400
Gross yield		tonn	40
	First year	million UZS	1212,3
Average annual cost	Third year	million UZS	164,7
	Fifth year	million UZS	178,1
Average annual income		million UZS	355,2
Average annual profit		million UZS	190,3
Cost recovery period		year	5

However, it is known that in the winter and early spring seasons, cold weather is observed in our country and requires additional heating systems and energy consumption. In practice, as a result of interruptions in gas supply to greenhouses in the winter season, "entrepreneurs' hands get cold from work". The only solution to this is to create a system of guaranteed supply of PLA with continuous energy at the market price (at gas export prices) and to create a system of compensating the damage caused by energy interruption.

In turn, the promotion of farms that have organized the use of alternative energy resources contributes not only to the development of the industry, but also to social development, reducing the pressure on the national energy system. Therefore, based on the resolution of the President of the Republic of Uzbekistan № PR-4422 dated August 22, 2019 "On the rapid measures to increase the energy efficiency of economic sectors and the social sphere, introduce energy-saving technologies and develop renewable energy sources" a number of benefits have been provided.

In conclusion, there is an opportunity for the rapid development of the horticulture network in our country, the potential of the regions, which can be achieved only with the introduction of modern management methods, market mechanisms of incentives and innovative technologies. Therefore, on the basis of research, directions and mechanisms of state support of the horticulture network are proposed, which are suitable for the interests of the parties and provide healthy competition, which are the basis for creating a favorable agribusiness environment, and which serve to increase the rural population's additional source of income, employment, and entrepreneurial ability.

References:

1. Resolution No. 81 of the Cabinet of Ministers of the Republic of Uzbekistan dated February 21, 2022

2. Resolution No. 37 of the Cabinet of Ministers of the Republic of Uzbekistan dated January 20, 2022

3. Resolution No. 306 of the Cabinet of Ministers of the Republic of Uzbekistan dated June 07, 2022

4. Resolution No. 167 of the Cabinet of Ministers of the Republic of Uzbekistan dated January 20, 2022

5. Resolution No. 95 of the Cabinet of Ministers of the Republic of Uzbekistan dated February 23, 2021.

6. Bloch, Peter C. and Andrei Kutuzov, editors. 2001. Rural Factor Market Issues in the Context of Economic Reform. Land Tenure Center, BASIS Project. Statistical Compendium

7. Annual reports of the Statistics Committee, Tashkent, 2021;

8. U.Alimov Analysis of socio-economic factors affecting the cultivation of melon crops: in case of Zaamin and Zarbdor districts of Jizzakh region, Journal "Sustainable Agriculture" №3(11) 2021 p. 12

9. U.Alimov "Reforms in the melon growing sector: results and trends" Journal "Sustainable Agriculture" Nº4(12) 2021 p. 9

10. U.Alimov "Status and importance of melon growing products production" Scientifc and practical agro-economic journal 2 (16), Tashkent, 2020, 54 p.;

11. "Reforms in the melon growing sector: results and trends" EPRA International Journal of Agriculture and Rural Economic Research (ARER) Volume: 10 | Issue: 9| September 2022 p. 15

 $12.\ https://xs.uz/uzkr/post/ozbekistonga-gsp-tizimining-taqdim-etilishi-qandaj-imkoniyatlarni-taqdim-etadi index and the second seco$

13. https://lex.uz/uz/pdfs/5980334

14. https://www.agros.uz/

№4(16).2022 Journal of "Sustainable Agriculture"

43

REFORMS IN THE FIELD OF SCIENCE AND INNOVATION: FACTORS AND RESULTS

A.Berdimurodov, PhD Student, Department of Economics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers - National Research University

Abstract

In the 21st century, the problem of management, organization of innovative activities, selection of methods and mechanisms for innovative development of various sectors of the economy has been in the focus of attention of economists. Innovative activity, innovative process and similar concepts are firmly established in various aspects of daily life, enterprise activity and economic sectors. In developed countries, innovation is one of the important factors in increasing the competitiveness of enterprises, strengthening their position in the market and producing consumer goods. The need to move the economy of Uzbekistan to the path of innovative development is also due to the fact that the world economy is developing based on the achievements of science. In this article, we analyze the main results of the focus on science and innovation and the reforms and focus on future priorities. We express the results of practical work in numbers and present conclusions.

Keywords: innovation, global innovation index, infrastructure, science, projects, grants, startups, international relations, prospective main directions

Introduction. Uzbekistan pays close attention to the issues of strategy and prospects for innovative development, which is relevant in connection with the globalization of world economic connections. As the President of the Republic of Uzbekistan Sh.M. Mirziyoyev "An important condition for the dynamic development of the Republic of Uzbekistan is the accelerated introduction of modern innovative technologies in the economy, social and other spheres with the widespread use of science and technology". In Uzbekistan, the introduction of modern innovative ideas, developments and technologies is identified as one of the main sources for ensuring a quick and high-quality breakthrough for the country and joining the ranks of developed countries in the world economy.

The priority areas for the development of the social sphere of the Republic of Uzbekistan in 2017–2021, approved by Presidential Decree UP-4947 of February 7, 2017 "On the Action Strategy for the Further Development of the Republic of Uzbekistan", also included the development of education and science. At the same time, the task was set to stimulate research and innovation activities, create effective mechanisms for the introduction of scientific and innovative achievements into practice, the creation of scientific and experimental specialized laboratories, centers at higher educational institutions and research institutes high technologies, technology parks.

In pursuance of the Action Strategy, as well as in order to implement the tasks defined in the Message of the President of the Republic of Uzbekistan to the Oliy Majlis of December 22, 2017 by Decree of the President of the Republic of Uzbekistan No. UP-5308 of January 22 2018, the State Program for the implementation of the Action Strategy in five priority areas of development of the Republic of Uzbekistan in 2017-2021 was approved years (hereinafter referred to as the Action Strategy) in the "Year of Support for Active Entrepreneurship, Innovative Ideas and Technologies". This State Program provided, in particular, in the field of economic development and support for active entrepreneurship - creation of favorable legal, organizational conditions for the development of active entrepreneurship, the introduction of innovative ideas and technologies, further improvement of legal guarantees of protection and mechanisms to prevent illegal interference in the activities of business entities, tax and customs policy, banking and financial sector, development of a strategy for reforming the agricultural sector, refusal to provide individual benefits with the provision of benefits to industries and sectors of the economy, active development of regions.

Thus, in order to accelerate the development of the country on the basis of modern achievements of world science, innovative ideas, developments and technologies, as well as the consistent implementation of the tasks defined by the Action Strategy by Decree The President of the Republic of Uzbekistan No. UP-5544 dated September 21,2018 approved the "Strategy for Innovative Development of the Republic of Uzbekistan for 2019-2021".

The document also approved the "Roadmap" for the implementation of the strategy and targets for the innovative development of the Republic of Uzbekistan until 2030.

The main goal of the Strategy for Innovative Development of the Republic of Uzbekistan for 2019-2021 is the development of human capital as the main factor determining the level of competitiveness of the country on the world stage and its innovative progress.

The main objectives of the Strategy are: the entry of the Republic of Uzbekistan by 2030 into the 50 leading countries of the world according to the rating of the Global Innovation Index; improving the quality and coverage of education at all levels, developing a system of continuous education, ensuring the flexibility of the system of training personnel, based on the needs of the economy; strengthening the scientific potential and efficiency of scientific research and development, creating effective mechanisms for integrating education, science and entrepreneurship for the wide implementation of the results of research, development and technological work; increasing the investment of public and private funds in innovation, research, development and technological work, the introduction of modern and efficient forms of financing activities in these areas; improving the efficiency of public authorities through the introduction of modern methods and management tools; ensuring the protection of property rights, creating competitive markets and equal conditions for doing business, developing public-private partnerships; creation of a sustainable socio-economic infrastructure.

Materials and methods

In order to clarify the problems that clearly affect the promotion of innovations and ways to solve them, a methodology was applied to identify scientific problems based on the analysis and generalization of scientific research on the research issues, as well as factor and content analysis, the task of which included the selection, interpretation and systematization of the identified factors.

Data analysis.

Innovative activity of networks is the acquisition of methods and tools for the implementation of specific processes, including the results of research and development that increase the efficiency of the development of new products and technologies in production. It should be noted that innovation includes the entire innovation process, from the emergence of an idea to the distribution of a product based on it on the market. An innovative process occurs when the results of scientific research are applied to production and the results of this process affect_ consumers, that is, when the processes of relations

between scientific research, production and consumers are implemented. Each of its components performs a clearly defined task in the overall process: innovation is created in the field of research and development, in production – it is repeated and then passes into the sphere of production or non-production consumption, where its properties are realized. It should be noted that several practical works related to the implementation of innovative processes have been carried out in Uzbekistan in recent years.

As you know, recently in November 2022, 5 years have passed since the establishment of the Ministry of Innovative Development of the Republic of Uzbekistan. As a result of the implementation of the «Innovative Development Strategy of the Republic of Uzbekistan for 2019-2021» adopted in 2018, great progress was made in ensuring and encouraging the introduction of technological development and innovations in the fields of agriculture, energy, construction, education and healthcare. Importantly, a number of works on the development of human capital have been carried out, and the coverage of higher education and post-higher education has been significantly expanded. During 2018-2022, the number of quotas allocated for doctoral studies increased by 7.1 times and reached 3600 in 2022. Internresearch institute was introduced as a preparatory stage for post-higher education and 1200 young scientists were trained. (Fig. 2)

Compared to 2015, our republic has risen by 40 places in the Global Innovation Index (GII) ranking. Ranked 82nd in the Global Innovation Index in 2022. For information: Our country was included in the index for the first time in 2015 and ranked 122 out of 141 countries. In 2021, our republic rose to 86th place (+36) among 132 countries of the world. Ranked 4th among 10 countries in Central and South Asia. This achievement, of course, confirms the effectiveness of the reforms implemented in our country and the correctness of the directions of economic development determined by the head of our state. (Fig. 1). According to the Decree of the President of the Republic of Uzbekistan No. PF-5544 of September 21, 2018, the priority goal of the Republic of Uzbekistan is to enter the ranks of the 50 advanced countries of the world according to the Global Innovation Index rating by 2030. The main direction of the implementation of this goal is to adapt the field of science to modern economic conditions, which, in turn, will lead to fundamental changes in the structural, organizational, personnel, infrastructure and financial development of science, regulated by a strong regulatory



Figure 1. Results of Uzbekistan in the Global Innovation Index (GII) rating 2012-2022.

The Global Innovation Index (GII) is an annual rating and analytical review of more than 130 countries in the field of innovative activity, on the basis of which countries are sorted by performance, and ultimately serves as a barometer of the country's socio-economic and innovative development for the world community.

The Global Innovation Index (GII) rating consists of 7 main areas:

- 1. Management institutions;
- 2. Human capital and research;
- 3. Infrastructure
- 4. Market development;
- 5. Business development;
- 6. Results in the field of knowledge and technology;
- 7. Creative results.

All directions are based on 21 structural sub-blocks and 80 indicators that directly cover the socio-economic development and institutional foundations of the country. The rating is compiled every year and the analysis of the achieved results allows to assess the competitiveness of the newly formed innovative economy and the effectiveness of these reforms in general. Currently, media coverage of these results remains relevant. If we are lagging behind in the main areas of the global innovation index, we consider it appropriate to introduce effective mechanisms based on these indicators, hold contests, carry out promotion work among young people and the general public, and organize educational seminars. In order to implement these tasks, the Law "On Science and Scientific Activity" and the Law "On Innovative Activity" were adopted. In 2017-2022, a total of 88 normative legal documents related to science and innovative activities were adopted - 3 Laws, 6 Presidential Decrees and 28 decisions, 40 decisions and 12 orders of the Cabinet of Ministers, as a result of which competition in the field, interests an atmosphere of responsibility and responsibility was formed. Also, two important documents were signed by our President. The first document is the "Concept of Development of Science until 2030", approved by Decree No. PF-6097 of the President of the Republic of Uzbekistan dated October 29, 2020. The second document, "Innovative development strategy of the Republic of Uzbekistan in 2022-2030". The main purpose of adopting these documents is to create a solution for all scientific and practical work that provides for the development of the process of forming the creative economy of the continuous (cyclical) "innovation-capitalinnovation" ecosystem, which includes all the main stages from the creation of new jobs to the creation of economic value.



Figure 2. Post-tertiary coverage. Quotas allocated for doctoral studies from the state budget 2017-2022

At the same time, the level of commercialization of scientific and innovative developments in the real sector of the economy, cooperation between science, education and industry in the real sector remains relatively low. The amount of annual funds allocated from the state budget to the fields of innovation and science was increased by 3 times and the amount of project financing was increased by 3.5 times, in particular, 40 percent of the funds were directed to the purchase of necessary equipment, reagents and materials; The management system in the field of science has been improved, in particular, a national rating

system aimed at evaluating the effectiveness and innovative activities of scientific organizations has been introduced; The number of young scientists was increased by 1.5 times, in particular, from 6.5 thousand people (indicator in 2018) to 10.8 thousand people (indicator in 2022); In higher education and scientific-research institutions, the basic salaries of employees with scientific degrees were increased by 3.2 times, and the procedure for paying employees additional fees based on target indicators was introduced; The material and technical base of scientific

research institutes has been fundamentally renewed, and a total of 160.16 billion was provided to them over the course of 5 years. 272 types of laboratory equipment worth soums were supplied; The system of financing science and scientific activities has been diversified, the funds allocated to science and innovation from industrial enterprises and the private sector have increased threefold in 2018-2022, in 2022 (954 billion soums were spent) from state funding (allocated 591 billion soums) 1 increased by 6 times; Deputy heads of all ministries and agencies, business associations, large organizations with a state share of 50 percent or more in the charter fund were assigned the task of introducing innovations (Chief Innovation Officer), and also established departments responsible for innovative activities; Modern infrastructures for the development of innovative activities were created, in particular, 19 new innovative infrastructures were established in the republic's territories (9 technological parks, 4 innovation centers, 3 business accelerators, 3 co-working centers, 1 landfill);455.1 bln. scientific developments in the amount of soums were commercialized, of which 366.8 billion soums worth of products were produced (324.8 billion soums worth of products were sold and 88.3 billion soums

worth of services were provided); At the same time, there are still problems, for example, we believe that it is appropriate to completely abandon the current theoretical methodological course at the stage of the basic doctoral studies, and instead of it, in the field of specializations, the subjects and courses that the doctoral students need to master must be mastered in the credit-module system or other systems.

For the innovative development of the regions, from 2021, regional departments of the ministry were established, and 28 innovative districts were designated throughout the Republic, and 214 scientific, 102 startup and 128 commercialization projects are being implemented in the regions. 205 innovative projects worth 199.4 billion soums have been implemented and 122 new enterprises have been established for the innovative development of

regions. (Table 1).

Basedontheprinciples of deep science and digitalization, priority projects are being implemented in the fields of robotics and mechatronics, artificial intelligence, biotechnology, soil science, geology, viticulture and winemaking, hydrogen energy, development of the copper industry, telemedicine, development of foreign languages. In order to develop scientific and innovative activities in the regions, innovative development departments of the Republic of Karakalpakstan and regions were established in the ministerial system.

Table 1. Results on the innovative development of regions

2			
t services			
6			
v			
cies			
10,5 %			
Science			
English			
For			
Science			

Karakalpakstan in order to improve the living standards of the residents of this region, create new high-tech jobs, improve social infrastructure, and implement projects with price and quality advantages and innovation elements in the areas of comprehensive innovative development of the region based on the introduction of highly effective innovations in selected districts. 28 districts that are being transformed into innovative regions in the republic and regions have been approved. Deputies on innovation issues of 28 innovative districts were appointed to be responsible for the direct implementation of these issues. As of 2017, there were no unified areas for the implementation of the results of scientific developments in the regions of the republic, for the effective use of the existing scientific, technical and innovative potential. In order to create a favorable environment for the development of high technologies, the sustainable development of scientifictechnological and innovation entrepreneurship, the establishment of small innovation enterprises, the production and supply of competitive, scientific-volume

products in national and foreign markets, 19 innovative enterprises have been established in our republic over the past 5 years. Infrastructures (technological park, business incubator, business accelerator, co-working center, etc.) were established (Fig. 3).



Figure 3. Organization of innovative infrastructures in the Republic of Uzbekistan.

Analyzing the above data, there are many problems here. In particular, the number of fundamental and practical projects remains small. Of course, the fact that there are many practical projects is a good indicator. However, in developed countries, the place of innovative projects is in the first place. In order to solve these problems, we believe that it is necessary to fundamentally improve the conditions for the announcement, holding, commission consideration and discussion of state grants and other scientific competitions. A number of works are being done on the basis of foreign experiences. In particular, 12 foreign companies («Yemmak» (Turkey), «Fasso» (Italy), «Lumeks» (Russia), «Hastovuk» (Turkey), «VDL agrotes» (Netherlands), "Pas reform " (Netherlands), "Main" (Netherlands), "Biotrof" (Russia), "Agrofeed" (Hungary), "Sobb" (USA), "JamesWay" (Canada), "Pitersime" (Belgium) experiences were studied. Based on experiences, the role of innovations in the agricultural sector is expanding. (Table. 2).

Table 2.

Expenditures directed to scientific and innovative from the state budget in 2019-2021 (in billion soums). Source: Ministry of Innovative Development of the Republic of Uzbekistan

Commercialization of Scientific Developments	22.7 billion soums	79 pr	ojects
Week of Innovative Technologies in agricultural sector	1.67 billion soums	16 contracts	25 agreement
Innovative Technologies in	12 foreign companies	16	25

An innovative energy-saving greenhouse based on modern technologies of South Korea worth 109,000 US dollars was established in the Andijan experimental exhibition area for the purpose of growing seedlings of medicinal plants. Cultivation of amaranth, stevia, rastaropsha, helba medicinal plants was started on the 8.0 hectares of cultivated area belonging to Andijan experimental exhibition area. In the first year, more than 4.3 tons of amaranth grain, 600 kg of rastaropsha grain, more than 300 kg of helba grain, 500 kg of stevia leaves were obtained and 10,000 stevia seedlings were grown.

In terms of assisting in the commercialization and introduction of new developments into production and the implementation of start-up projects, the formation of a state order for scientific research projects was launched based on the needs of the industrial sectors for scientific development and innovation and existing technological problems. As a result of the formation of the system created by the Ministry, the amount of funds allocated by the economic sectors for research and experimental work is 57.8 billion in 2019. 96.6 billion soums in 2021. To soums, the growth rate was 160 percent. 170 bln. 197 million soums. Was delivered to soum. In 31 ministries, offices and chartered funds operating in the economic spheres, one of the deputy leaders of business associations with a state share of 50% and above was assigned the task of introducing innovations - Chief Innovation Officer, and specialized departments for carrying out innovative activities were opened in each of these organizations. The Regulation on short-term contract employment of scientific staff in interested organizations in the real sector of the economy, including the procedure for providing employment while retaining the main job at a scientific-research institute - «internship» internships, was developed and approved. In addition, the «Innovative products» section, which is not linked to the TIF code, has been established on the Cooperation.uz electronic cooperation portal, and contracts with state bodies and large state organizations on the development, implementation and technical support of local scientific organizations and enterprises with innovative goods and software products have been established through the portal. Authorized to sign directly. From August 1, 2022, the Regulation on the organization of scientific research based on the chain of «networkterritory-scientific/higher education organization» in the organization of the production of innovative products was approved. As a result, on the basis of the «1+1» principle, scientific projects are financed together with network organizations on a competitive basis. Industrial clusters and large innovative enterprises are regularly carrying out certain activities in order to form the skills to invest in «radically innovative» innovations aimed at solving their needs and problems. In the last five years, a number of practical and effective new mechanisms have been introduced in the rapid development of the economy, the integration of science and production, the introduction and commercialization of scientific and technical developments in all spheres of state and public life. As a result, in 2018-2022 scientific and research institutions will spend 455.1 billion. Scientific developments in the amount of soums were commercialized, of which 366.8 bln. Produced products worth 324.8 billion soums and provided services worth 88.3 billion soums. In order to develop the "Scientific-scientific organization-region" and «Scientificscientific organization-network" systems, the spring and autumn stages of the new effective "Commercialization Forum" have been launched regularly. In the spring stages of the commercialization forum, within the framework of the "Scientific-scientific organization-territory" system, the Republic of Karakalpakstan and regional governments will allocate 6.48 billion to 37 developments in 2021. 8.93 billion soums for 44 developments in 2022. Soum funds were directed. 17.1 billion within the autumn stage of the 2022 commercialization forum. Soum contracts, as well as 2.78 bln. Practical work has been started within the framework of export contracts in the amount of US dollars. For information: the farm "IPAK KOCHAT KLASTER" has a 5-year contract with the private enterprise "ASVS Oyl" of the Republic of Kazakhstan for the supply of seedlings of the new "Uzbekistan" and "Marhamat-2017" varieties

of mulberry, the total cost of which is 2.5 million. The US dollar export contract was signed. Within the framework of 66 projects presented under the "Scientific-Scientific Organization-Network" system, new types of innovative and import-substituting products were created, including:

a) The production of dental implants with bioactive coating based on high technologies has been launched;

b) the production of environmentally friendly, resourcesaving and economically effective new generation "TERIA" series bacterial biofertilizer was launched;

c) the production of 4 types of superplasticizers that increase the strength of concrete products has been launched;

d) the production of reverse osmosis water filters, which purify water at the molecular level, has been launched.

Starting from 2022, 17 new innovative (spin-off) enterprises specializing in the production of scientific and innovative products (goods and services) operating in the fields of agriculture, food industry, construction, health care, automotive industry will be launched. An additional one-time reward system was introduced to the authors of patented intellectual property objects in the amount of ten times the base calculation amount. As a result, in 2018-2022, one-time awards of 1115.63 million soums were paid to the authors of scientific development and scientific teams. Spending on science and innovation has increased significantly since 2017. A total of 1488.3 billion from the state budget for the implementation of programs and projects on scientific and innovative activities. Soums (in 2018 - 198 billion soums, in 2019 - 347.7 billion soums, in 2020 – 428.6 billion soums, in 2021 – 514 billion soums). Interest in science among the young generation has increased, and since 2017, a lot of work has been done to create favorable conditions for the development of scientific and innovative activities in our country. (Figure 7).





In this regard, a strong legal framework has been created, reforms have been implemented that allow for a significant increase in state spending on science and innovation, work is being actively conducted to improve the potential of personnel and launch new infrastructure facilities. But at the same time, some small problems are causing the big problems mentioned above. In particular, we believe that it is in accordance with the goal to implement the procedure for the implementation of the procedure for state financing of 25 to 50 percent of the expenses of leading scientists of foreign scientific centers and institutes and universities, which are involved in the educational and experimental and scientific activities of scientific research institutions and higher educational institutions. In this, the main task is to ensure access to the world market through the full use of local scientific potential and the transfer and commercialization of modern technologies, including scientific and innovative developments, and the basis for such high goals is created.

Conclusion and recommendations.

The results of the study proved that in the conditions of economic integration, the system of innovation processes should be institutionalized as a social institution for the interaction of science, economics and education to solve the problems of modernization and development of a new formation of human resources capable of working in modern conditions. The formation of a social institution of innovation in universities is hampered by the combination of factors of an objective and subjective nature that we have identified. The research hypothesis was confirmed that the identification, systematization and formulation of factors and trends in the development of innovative processes in universities is an urgent scientific problem that requires research and formulation of priority trends. The purpose of the study was achieved: the systematization of factors made it possible to formulate a number of major problems and trends in the development of innovations at universities that need to be addressed: 1) accelerating the diffusion of knowledge from universities, i.e. from the field of development to the real economy - involves the efforts and increase in the efficiency of commercialization departments, which should be in close connection with production; scientific developments of the departments often remain without implementation and this reduces the motivation of scientists for research; 2) the development of the paradigm of entrepreneurial education, combining academic and entrepreneurial culture - involves the convergence of the paradigms of the functioning of universities (priority of intellectual capital) and economic spheres (priority of innovative growth of the economy); the development of this trend implies not only the strengthening of the applied nature of research by scientists, but also an increase in the volume of investments in the education system by the economic sector; 3) the need for a more effective and intensive development of the strategy of the higher education system, which involves updating the content, changing the forms of education from classroom to dual practical forms of education, and intensifying the development of innovative project interdisciplinary technologies. In this direction, scientific research should be both fundamental and applied. The goal of all transformations in the system should be the position that new knowledge and research results should be converted into a real productive force for production. Our study has a perspective in studying the content and tools for implementing the scientific trends formulated in this article.

In conclusion, our main and ongoing goals are to create conditions for the effective and stable operation of scientific and technological products market based on supply and demand. It is also necessary to improve the protection of intellectual property, to ensure the rights of producers of goods to produce products and receive income. In addition, the other main and ongoing goals are the introduction of the principles of integration and cooperation in the development of innovative processes, the attraction of investments in the development of infrastructure, the expansion of opportunities for the motivation of quality labor and the promotion of production, the "new" of the economy of commodity producers (organic products, environmental restrictions, the quality and certification system and other systems) and "intelligent, smart" (introduction of Internet technologies, electronic tools, etc.) to increase the demand for innovative services (new technology and high-performance equipment, selective varieties, development of innovative infrastructure, etc.). Currently, biotechnology, renewable energy, increasing soil fertility, mining and metallurgical industry, development of animal husbandry, and artificial intelligence are identified as priority directions in the field of science and innovation in the Republic of Uzbekistan. At the same time, it is necessary to develop specific mechanisms regarding the insufficient implementation of resource-saving technologies, taking into account its competitiveness in the foreign market, in the development of export-oriented priority sectors, relatively limited measures of state support for price parity, and the level of labor incentives.

References:

1. The main results of the Ministry of Innovative Development of the Republic of Uzbekistan for 2018-2022. Tashkent – "Innovative development publishing house" – 2022

2. National Report on Science and Innovation of the Republic of Uzbekistan for 2017-2021 - Tashkent, 2022.

3. Y.E.Aliyev Innovative economy. Study guide. Tashkent. 2019.

4. A. Taniyev Innovative economy. Textbook. Samarkand. 2021.

5. Law of the Republic of Uzbekistan "On Science and Scientific Activity" No. LRU-576 on 29.10.2019. // https://www.lex.uz/docs/4571492 6. Law of the Republic of Uzbekistan "On Innovative Activity" No. LRU-630 on 24.07.2020. // https://lex.uz/docs/4910448

7. Resolution of the President of the Republic of Uzbekistan, No. PR-3365 "Comprehensive measures for strengthening the infrastructure of research institutions and development of innovation activities" on 01.11.2017. // https://lex.uz/docs/3398526

8. Resolution of the President of the Republic of Uzbekistan, No. PR-3698 "On additional measures to improve the mechanisms for introducing innovations in the industry and the economy" on 05/07/2018. // https://lex.uz/docs/3723559

9. Resolution of the President of the Republic of Uzbekistan No. PR-4546 "Measures to further reduce bureaucratic barriers and the introduction of modern management principles in the activities of state bodies and organizations" on 09.12.2019. //https://lex.uz/docs/4634625

10. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. RCM-133 "On measures to further improve the regulatory framework for the development of scientific research and innovative activities" on 09.03.2020. //https://lex.uz/ru/docs/4759202

11. Decision of the President of the Republic of Uzbekistan No. PD-5544 "On approval of the Strategy of innovative development of the Republic of. Uzbekistan for 2019-2021", https://lex.uz/ru/docs/3913186

12. Resolution of the Republic of Uzbekistan PR-5853 "On approval of the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030" on 23.10.2019. // https://lex.uz/ru/docs/4567337

13. Science and innovation. Information from the official website of the State Statistics Committee of the Republic of Uzbekistan // https:// stat.uz/ru/

14. The official website of the Ministry of Innovative Development of the Republic of Uzbekistan // www.mininnovation.uz

15. The main results of the Ministry of Innovative Development of the Republic of Uzbekistan for 2018-2022. Tashkent – "Innovative development publishing house" – 2022

16. OECD/FAO (2019), OECD-FAO Agricultural Outlook 2019-2028, OECD Publishing, Paris/Food and Agriculture Organization of the United Nations, Rome. https://doi.org/10.1787/agr_outlook-2019-en.

17. Food and Agriculture Organization of the United Nation.s Agricultural productivity and Innovation http://www.fao.org/3/a-i6583e.pdf

18. The main indicators of the socio-economic development of the Republic of Uzbekistan in 2014-2022. http://www.stat.uz .

19. https://www.wipo.int/ - "Global innovation index" official website.

RISKS OF AGRICULTURAL PRODUCTS AND THE NEED FOR INSURANCE IN DEVELOPING COUNTRIES

K.A.Nosurullaev - PhD student of National research university "Tashkent institute of irrigation and agricultural mechanization engineers

Abstract

The system of agricultural insurance is a key sector of the state economy and the development of agricultural sector in developing countries. As we may see now developing countries as China, Brazil, India, Ukraine and Russian Federation are the most leading agricultural countries showing good indicators of agricultural products export. By the aid of this insurance program farmers have become secure and make a significant contribution to the development of rural economy and, as a result, world economy. This article is aimed at the risks of agricultural products and agricultural insurance market, its success and failures. The article analyzes the risks of production of agricultural products, the structure of agricultural insurance systems, focuses on the sustainable development of the agricultural sector. Keywords: Agricultural insurance, developing countries, agricultural risks, risk management, crop insurance, insurance premiums.

Introduction. Risk management is critical to the investment and financial decisions of farmers in developing and transition economies. The main risk management measures in agriculture include the selection of plant and animal varieties, methods of growing crops and animals, the diversification of agricultural enterprises, as well as the adoption of precautionary measures against adverse weather events, such as the use of mulching and shelter belts, and possibly most important of all, providing access to additional irrigation facilities.

Agricultural insurance, although one of the most frequently cited risk management tools, can only play a limited role in managing agricultural risks. The applicability of insurance in any particular situation is based on a consideration of whether it is a cost-effective means of addressing a given risk. In practice, agricultural insurance is almost always a complement to a whole range of risk management measures, of which good farm management practices are an important element. Serious testing of the design and implementation of an insurance program, in addition to other risk management measures, depends on the balance of costs and benefits for both the farmer and potential insurance providers.

However, agricultural insurance is a growing business driven by the growing commercialization of agriculture, international trade and foreign direct investment, and the development of new insurance products. The changing economic environment has also sparked renewed interest in crop and crop insurance programs and products among governments and development professionals.

Materials and Methods. Natural disasters have dealt a major blow to agricultural production. They can cause great damage to farmers and forest owners. Insurance can help manage these losses, and crop insurance is that part of this financial mechanism that is specifically designed to cover losses from adverse weather conditions and similar events beyond the control of producers.

First, and this is the basis of understanding insurance, is the fact that insurance does not and cannot eliminate risk. It spreads the risk. This distribution has two aspects. The first dimension is the distribution by industry or economy, extended in the case of international reinsurance to the international sphere. The second dimension of propagation is through time. Most insurance programs work in both dimensions. It is important to note that insurance does not directly increase the producer's income. It just helps to manage the risks for that income.

Second, insurance is a business. Insurance indemnity is payable only in the event of a claim under the policy. The policy must be in force with the premium paid by the time the insured event occurs. Most policies include an element of risk-sharing through a franchise (also known as a "franchise"). This amount is a percentage of the loss, which is fully covered by the insured person.

Third, insurance premiums should cover several areas of costs in addition to covering reimbursement costs in accordance with applicable policies.

Many attempts have been made in developing countries to establish crop insurance programs. Some of them have succeeded in laying the foundation for sustainable risk management. But there were also many failures. Most of these programs, which have not been proven to be reliable, were created based on unrealistic expectations.

In any business agreement, both parties to the transaction must expect benefits. Crop insurance deals are no different. This defines the first frontier: crop insurance is bought and sold on the market. Buyers should be aware that premiums and expected benefits are valuable; sellers should see the opportunity to generate a positive actuarial result over time and make a profit. The consequences of this condition will be detailed later in this publication.

Crop insurance is not a one-size-fits-all solution to the risks and uncertainties that are inherent in agriculture. Rather, insurance can cover part of the losses caused by certain hazards. The second boundary is that insurance plays a limited role in risk management in agriculture. Again, the implications of this will be discussed below.

The third frontier is that any limitations to effective and economical crop insurance, while real at any given moment, may change over time. Agricultural enterprises and systems are dynamic. They change over time and in doing so represent different patterns of risk and new ways in which agricultural technologies and farm management practices can cope with production and other risks. The design of insurance solutions is an equally dynamic area of research and development. New methods for identifying the existence of risks that have resulted in losses, together with more efficient and cost-effective methods for measuring losses, mean that new types of insurance products can be developed. When companies see a business opportunity here with obvious demand, then these products will be refined, financed and sold. This dynamism will be reflected later in this brochure.

Before looking into the future, it is helpful to take a detailed view of the crop insurance business in today's world. While this brochure is primarily about crop insurance, which accounts for the majority of agricultural product insurance, some data will include livestock and aquaculture insurance. These areas of insurance will be the subject of the FAO brochure accompanying this publication.

As a measure of the size and distribution of the global agricultural insurance market, Swiss Re (2019) has estimated that total agricultural insurance premiums collected in 2017 (including premium subsidies) were worth about USD 30 billion (see Table 1 for regional distribution). Europe and North America accounted for 53 per cent of all premiums collected while the Asia Pacific region accounted for much of the rest (42 per cent). Africa and Latin America and the Caribbean (LAC) represented a small share, collecting one per cent and four per cent of total premiums, respectively.

Table 1.

Estimated Agricultural Insurance Premiums Collected and Level of Coverage in 2007 And 2017, **By Region**

Asia Pacifi

REGION	AGRICULTURAL				
	INSURANCE	PREMIUMS			
	COLLEC	TED (USD			
	BILLION, 2	017 PRICES)			
	2007*	2017**			
Africa	0.09	0.3			
Asia Pacific	3.73	12.6			
Europe	4.0	3.9			
Latin America	0.77	1.2			
and the					
Caribbean					
(LAC)					
North America	15.07	12.0			
Total	23.6	30.0			

Europe	0.64	1.19
Latin America	0.24	0.45
and the		
Caribbean		
(LAC)		
North America	5.01	5.52
Total	0.92	0.91

** Insurance penetration rates were calculated by th

2007

0.31

PENETRATION (PREMIUM

2017

0.08

0.60

AS A PERCENTAGE OF AGRICULTURAL GDP)**

* The 2007 data only covered 65 countries, which together accounted for 75 per cent of estimated global premiums collected that year (Matoul and Stutley, 2010). The data in this column has therefore been scaled up and adjusted for inflation.
** 2017 data are taken from Swiss Re (2019).

using the "FAO Statistical Yearbook: W Food and Agricult

The Swiss Re data shows there has been considerable growth in agricultural insurance in LMICs since a 2007 World Bank survey (Mahul and Stutley, 2010) estimated total global premiums at \$20 billion (\$23.6 billion in 2017 prices) – a 30 per cent increase and a real growth rate of 2.4 per cent per annum. As shown in Table 1, nearly all this growth was in the Asia Pacific region where premiums increased from an estimated \$3.73 billion in 2007 to \$12.6 billion in 2017 - an annual growth rate of nearly 13 per cent. Africa experienced similar growth, but because it started from a very low base in 2007 (\$90 million), the region only accounted for \$300 million in 2017. LAC was also a minor player in 2017 despite a 50 per cent increase in collected premiums between 2007 and 2017.

It is the opposite story in high-income countries. Between 2007 and 2017, total agricultural insurance premiums collected in Europe and North America actually declined. Despite recent growth in agricultural insurance, penetration rates (as measured by the ratio of total agricultural premiums collected, an approximate measure of the value of coverage)8 to agricultural GDP remain small in Asia, Africa and LAC compared to North America and Europe (Table 1). The penetration rate was only 0.08 per cent, 0.45 per cent and 0.6 per cent, respectively, in Africa, LAC and Asia Pacific in 2017, compared to 5.5 per cent and 1.2 per cent in North America and Europe (Table 1).



Figure 1. Regional share of agricultural insurance premiums collected in 2007 and 2017 (%)

These figures present a snapshot view of agricultural and crop insurance. A dynamic rather than static view indicates a changing situation. Agricultural insurance is a growth business area. This growth is driven not only by the increasing commercialism of agriculture and the availability of new types of insurance products, but also by international trade policy developments. These points are covered in greater detail in Section 2, Growth in Demand for Crop Insurance Products.

Globally, about 83 per cent of agricultural insurance in 2017 was for crops (Swiss Re, 2019), down from about 90 per cent in 2007 (Mahul and Stutley, 2010), while insurance for livestock, horticulture (including greenhouses), aquaculture/fisheries, and forestry has been growing.



Discussion and Results. The expected growth in demand has its origins in changes in the farming sector.

• Evidence is accumulating of connections between climate change, and the increasing incidence of crop damaging weather events of extreme severity.

• Farming is becoming steadily more commercialized, with greater levels of financial investment. Farmer/ investors and their banks will frequently examine the feasibility of using a financial mechanism i.e. insurance, in order to address part of the risk to their financial investment. As a part of this trend to commercialization greater use is now being made of contract farming arrangements, where insurance is one of many services provided, along with inputs, to growers. In summary, there is a trend to formalize risk management in farming, with insurance being one obvious mechanism which can be harnessed for this task.

• The World Trade Organization (WTO) regulations generally forbid governments from subsidizing agriculture directly; however, they permit the subsidization of agricultural insurance premiums. For those countries wanting and able to effect transfer payments into their farming sectors, insurance provides a convenient channel for doing so. In the face of this WTO regulation, it is clear that demand for crop insurance will increase in those economies that wish to implement a policy of permitted subsidization of their farmers.

• The dynamism of the farming sector, and its environment, is reflected in developments in the design of new insurance products. In the last decade two types of new products have been introduced. In some cases these have partially displaced existing covers; in others they have resulted in demand from new clients. The products are firstly, Crop Revenue products, secondly, Index or Derivative products.

• Accidental introduction of exotic pests/diseases is something which concerns all countries where agriculture is an important part of the economy. Insurance can address the risk of a breakdown of these measures.

• Insurance can also assist in managing the onfarm production risks consequent to changes in pest management practices. Such changes are increasingly required in order to address environmental protection and food safety concerns.

Many of these apparently diverse influences have a major common theme. This is that any insurance arrangement will involve not only the farmer and the insurer, but also important third parties. Consideration is now given to these changes to the business of farming, and to how they have increased demand for crop insurance, or might be expected to do so in the future.

The scientific community is not unanimous in attributing the increases in extreme weather events to global warming. However, there is a strong body of opinion which holds that this is the case. Their thesis is that global warming means more energy in the system. A consequence of this is a rise in the frequency and magnitude of extreme weather events.9 This is considered one of the causes of the increases in losses noted in the previous paragraph. The other major cause is linked to socio-economic factors such as increasing wealth (so there is more to be lost), and movements of populations to coastal areas which, although more productive in some senses, are more vulnerable to windstorm, storm (tidal) surges and flood damage.

The increasing incidence of crop damaging weather events is likely to continue to push demand for insurance coverage of losses. At the same time the insurance industry is mindful of increasing exposures, and is exploring new financial instruments to assist in managing this exposure.

A listing of key risks for agriculture across the world would be long. For the present purposes it is useful to focus on those which are of major concern to developing countries. Further, they can be clustered into a number of groups. One such clustering would produce a list as follows:

• Production risks;

- natural resource risks;
- financial risks;
- marketing and price risks.

Production and natural resource risks are relevant to this discussion of crop insurance, and are discussed in greater detail below. Financial and marketing/price risks fall outside the scope of the present publication, except in the case of crop/revenue insurance products, as discussed above.

Production Risk Perils are the main category of insurable risks. Both quantity and quality losses can result. Perils included are:

• Adverse climate conditions: drought, excessive rain, flood, windstorm, frost, hail, sunburn, snow;

pest and disease attack;

• fire.

Drought. Drought is both a major concern of many developing countries, and the natural weather event which causes most problems for insurers. The reasons for this are many. Firstly, insurers feel most confidence when an adverse event has a clearly defined time of impact, coupled with a clearly defined geographical area. The classic example is hail, which may do its damage in a matter of a few minutes, or even seconds, and will typically impact an area confined to a few hundred square meters up to a few square kilometers. Hail damage is clearly attributable to the adverse weather event, and is readily verified as such provided that a field inspection is undertaken.

By contrast drought has a vague beginning, its effects linger for a very long time, and can extend over more than one growing season. Moreover, it typically impacts a very wide land area. Production loss caused by drought can be aggravated by the incidence of other problems, e.g. diseases attacking plants weakened by water stress.

From a purely underwriting point of view drought poses great difficulties for a standard crop insurer offering what is in effect a yield guarantee. Firstly, because drought affects a large number of growers in the same season - perhaps the whole of a country - the production losses are very large. This systemic or catastrophe exposure means there are problems in mobilizing sufficient insurance capacity to cover the sum at risk, even with recourse to substantial reinsurance. Secondly, droughts in recent years, at least in many parts of Africa, have tended to extend over more than one year. This experience means that it is extremely hard for insurance companies to obtain reinsurance for crop insurance portfolios which carry drought risk. Thirdly, the magnitude of the risk in most developing countries means that actuarially calculated premiums would be very high too high perhaps to attract all but the most at-risk growers. No insurer wants to build a portfolio based entirely on such a clientele.

For these reasons insurers are very wary of covering drought as an inclusion in standard crop insurance policies. This is particularly the case in those parts of the developing world where drought is the major weather constraint to crop production: Southern and Eastern Africa, Sahelian Africa, Horn of Africa, North Africa/Near East, Eastern Europe, Central and East Asia, South Asia, Central and South America. The list illustrates the key role which drought plays in the lives of much of the developing world's rural population.

Given the almost insurmountable problems involved in including drought in standard crop insurance policies for developing areas, attention in recent years has turned to examining whether index (coupon) policies could provide a useful measure of security. Initial developmental work in this field is promising.

Excessive rain. Crops need water, and much of the developing world's arable and horticultural production relies on rainfall. Too much rain at any time can damage a crop, but there are periods of special vulnerability, described below.

The first danger point is excessive rain just after germination and emergence. Entire crops can be washed out of the ground, necessitating resewing. This is an insurable risk, where the indemnity which would be written into the policy would be the costs of re-sowing, plus a possible additional amount in those cropping situations (common in tropical, rain fed agriculture) where a delay in sowing means that the eventual harvested crop is smaller than would have been the case had the crop been able to take advantage of the whole of the normal growing season. The next common point of vulnerability is at or near to harvest. Maize and other grains can sprout prematurely while still growing in the field. Various fruits (e.g. cherries) can be damaged by excessive rain or even any rain just prior to harvest. Other crops can be lost when excessive rain prevents harvest. An example is a crop such as tomatoes grown for processing. The processing factory schedule of crops for harvesting means that the date of harvest is fixed. Moreover, it is now common practice with commercial tomato crops to spray with ethrel (ethephon) in order to accelerate the ripening (reddening) of fruit which are still green, in order to allow once-over harvesting. If excessive rainfall is experienced just when the critical readiness for harvest is achieved, then harvest may be prevented, and the crop lost.

Flood. Flood damage may be due to on-site excessive rainfall, but it can also be caused by excessive precipitation elsewhere, and the subsequent rise of river and lake levels, to cause flooding of crop land. The risk is usually insurable. Exceptions would be crop land which is insufficiently drained or where existing drains are not maintained, and also flood plains exposed to a very high risk of flooding.

Flood is sometimes one of the results of severe storms. Examples are the frequent tropical cyclones experienced in the Bay of Bengal. These usually cause flooding of lowlying farmland along the affected coastal zone. Records indicate that although the fundamental peril is windstorm, the actual losses on farms – to livestock as well as to crops, have been due to flood damage resulting in turn from wind-induced high sea levels, which are known as storm surges.

Windstorm. Crop insurance programs in the Windward Islands (bananas) and in Mauritius (sugar cane) have already been mentioned. Both were set up to assist in managing the losses from excessive wind – cyclones in Mauritius and hurricanes in the Caribbean. High wind speeds affects nearly all crops – and can cause serious damage in forests.

As with other weather perils, the first move in risk management lies in appropriate farm management – correct attention to plant density (for mutual support), to the provision of shelter belts for those crops highly sensitive to wind (e.g. kiwifruit), and care with harvesting in the case of forests. It is not uncommon for problems to arise when partial harvesting takes place in forests.

Frost. Although not at all common in developing countries generally, there are some regions where this is an occasional risk, especially to vegetable and fruit crops. This applies especially to Eastern Europe and the Middle East.

Frost causes damage by the freezing of the water content of plant cells, and their subsequent rupture. It will be evident that it is not only the temperature which matters; it is also the time when the temperature is below a certain minimum level which causes a damaging event. Crop insurers write policies accordingly, sometimes constructing a damage point (i.e. insurance trigger) curve which plots temperature against time.

Frost conditions can impact a wide area, causing extensive damage. However, the micro-climate in a given site can increase the likelihood of frost damage. For example, fruit and vegetable production often takes place in valleys because of the presence of deep topsoil, washed down from surrounding hills, together with the availability of water from surface or groundwater sources. These same valleys can also be 'frost-pockets' because freezing, still air accumulates readily in this type of topography.

Hail. Hail holds a special place in the history and also the current practice of crop insurance. It was the first crop peril to be insured by a modern insurance company – the first policies being issued, in Germany, in 1791. It is also the simplest of weather perils to handle from an insurance point of view. Its incidence is readily confirmed by observation of damage, and compensatory growth factors are reasonably well understood for most major insured crops (see also under Loss Assessment below).

Moreover, over time, the likelihood of hail events in any given agricultural area can be estimated in a manner that permits actuaries to confidently set premium levels at values which both sides, insured and insurer, find reasonable. This is due also to its long history, and the manner by which records of damage have been prepared and retained over the years. This means that there is a wealth of data on the incidence of the peril, and of the crop damage which has been caused as a result.

Sunburn (sunscald): Sunscald, under exceptionally adverse conditions, causes damage to fruits such as pip and stone fruit, grapes and nuts. It is associated with the premature loss of foliage from the plant. The risk is insurable, often as an extra-cost option under multi-risk policies.

Snow. Snow can damage all types of crops, including fruit trees and it also a peril of note in forests, where excessive weight loading can cause breakage of parts of trees, or even toppling of the whole tree. Developing countries vulnerable include those in Central Asia, Eastern Europe and the Middle East regions. Snow is an insurable peril in many circumstances. In forests damaged by breakage through snow loading, the presence of broken tree parts can facilitate the buildup of pest and disease organisms.

Pest and disease attack. Insurance cannot substitute for sound management of the risk of pests, parasites and diseases. Indeed, this is a significant area of modern farm and forest management, with very substantial losses resulting from failures in this area.

Moreover, the growing importance of international trade in agricultural commodities impacts on the pest and disease issue in developing country farming in several ways:

• Phytosanitary regulations mean that any evidence of pest or disease in a consignment may disqualify produce from entry to the country of destination;

• similarly, pesticide residues are subject to very tight limits under the standards for international trade;

• competition in the market is fierce, and even if produce is allowed to enter, blemishes on fruit etc. mean the produce is unlikely to find a buyer.

Fire. One of the oldest perils to be covered in property insurance, fire is a major peril for many crops (especially broad field crops such as grains) and for virtually all forests. It is commonly included in multi-peril crop insurance, and is frequently the key peril under forestry covers (which may also include wind and snow damage).

Fires are caused by human action (and carelessness) and also by lightning strikes during electrical storms. Whatever the cause, there are control measures to reduce any losses. These may be through early detection and the subsequent means to take action and/or through the use of cleared firebreaks.

Insurance policies will normally state the expectations under the policy of the means to control fire losses. Again this is an example of insurance being just a part of a cluster of measures used to control risk.

Natural Resource Risks. These include:

• Adverse soil conditions, e.g. salinity, erosion of topsoil and loss of soil nutrients;

• deterioration in water quality e.g. due to pollution of the water table or natural water courses;

• lack of water from the irrigation source.

In the main these risks are best addressed by farm management practices. However, some of the underlying causes of these problems may themselves be insurable. For example, soil erosion may follow excessive rainfall and/or wind. Pollution of water may be beyond the control of the farmer drawing from wells or rivers.

Related to this is the risk that a water source used for irrigation may fail. Prolonged drought means that water tables fall, necessitating the boring of deeper wells. Similarly, rivers and streams can dry up, due again to drought, or to an increase in uptake of water upstream. Where this involves another country then this falls into the political risk zone, something that many insurance policies specifically exclude.

Conclusion. Risk management is an important task in the sustainable development of the agricultural sector. Foreign practice shows that the mechanism of risk management in agriculture is unique in each country, formed and developed in accordance with the culture of agricultural management. Many years of experience in agricultural insurance have been accumulated in developed countries. Effective mechanisms have been introduced to financially support agricultural producers and insure them against various risks. Agricultural crop insurance, income insurance and income stabilization are recognized as the most common areas of insurance.

Agricultural insurance is a confident supporting tool for financial resources of agricultural producers and investors. It is an effective tool for risk management in agriculture and its adoption by farmers as a new technology is dependent on many factors.

References:

1. Agriculture Financial Services Corporation (AFSC) [Electronic resource].

2. Insurance of crops in developing countries. FAO Ágricultural services bulletin 159 by R.A.J. Roberts. Food and agriculture organization of the united nations Rome, 2005.

3. Survey of effective factors on adoption of crop insurance among farmers: A case study of Behbahan County. Abolhasan Sadati, Farahnaz Rostami, Yaser Mohammadi, Omid Sharifi – Article in African Journal of Agricultural Research August 2010.

4. Empirical Analysis Agricultural Insurance Coverage Levels from Demand Perspective. Adnan Rayit. Conference Paper CSAE2018, October 2018, Hohhot, China. DOI: 10.1145/3207677.3277964.

5. 2021 Insurance Fact Book published by the Insurance Information Institute. www.iii.org- The online source.

6. www.AgroInsurance.com - Specialized informational and analytical resource featuring a broad array of issues related to agricultural insurance and risk management in the agrarian sector.

7. https://www.fao.org/home/en/ - Food and agriculture organization of the United Nations.

8. www.WorldData.info - Ministry of Finance of Uzbekistan.

9. https://www.iii.org/ - Insurance Information Institute.

FOREIGN EXPERIENCES ON EFFECTIVE USE OF INFORMATION SYSTEMS IN SMALL BUSINESS AND ENTREPRENEURSHIP

J.B.Hasanov Researcher of the State Statistical Committee of the Republic of Uzbekistan, Institute of Personnel Training and Statistical Research

Abstract

. In this article theoretical, scientific-methodical suggestions are given on foreign experiences of effective use of information systems in small business and entrepreneurial activities and the possibilities of their use. Keywords: : information systems, foreign experiences, small business and entrepreneurship

Introduction. The search for ways to eliminate existing obstacles in the development of entrepreneurship, the solution of problems related to financial support, the quality of the tool of business development has pushed the relevance of information to the second level.

At the same time, the information system is not only one of the main priorities of the state's socio-economic policy, but also the most important for business entities themselves in the market economy. It is known that, in the conditions of digitalization of the economy, the information communication system (ICT) has become one of the sufficiently important factors in production and service provision, even in relation to material and labor resources.

The introduction of ICT made it possible to reach a fundamentally new level of doing business for enterprises of economically developed countries. Leading companies in the information communication system in our republic, as well as those who have realized the need to change approaches to business management, are actively engaged. However, there are many barriers of financial, human resources and organizational nature in the field in which informationization is relevant even for small and mediumsized business entities. One of the important factors on the way to improve the management of business processes is that the specific features of the informatization of business activities in the small and medium business sector are not sufficiently studied.

Accordingly, the research of the organizational and economic aspects of the informatization of business activities has become very important, and these have been studied without attention until today, therefore, the development and justification of scientific, methodological and practical proposals for the development of small business and entrepreneurship on the basis of the informatization of business processes is one of the most urgent issues. means one.

Many Uzbek and foreign scientists have been engaged in studying the problems of small and medium entrepreneurship development. On effective use of information systems in small business and entrepreneurial activities R.A. Alimov, A.N. Aripov, B.A. Begalov, T.M. Butkeeva, R.Ya. Dosumov, O.I. Zhuravleva, M.A. Ikramov, T.K. Iminov, O.T. Kenjaev, Research by M.A. Mahkamova, M.M. Maksudov, X.A. Muhitdinov, S.S. Gulomov, M.Sh. Sharifkho'jaev, Sh.A. Tursunov, L.I. Shibarshova, T.Z. Teshaboev and others his works are widely known.

Studying the basics of the use of information technologies in Beznees management G.A. Titorenko, A.M. Mishenin, A.M. Karminsky, B.V. Chernikov, E.P. Bocharov, G.N. Smirnova, Dj. Kanter et al. also mentioned in the scientific works of Solutions to a set of issues on improving

business management systems based on a process approach Dj.Champi, E.Deming, M.Robson, B.3.Milner, V.G.Eliferov, A.A.Boyko, V.V.Kalyanov, E.V .Popova, E.G. Oikhman, V.V. Repin, A.G. Kuryan and others. reflected in the scientific works of the theoretical, practical and scientific-methodological aspects of effective use of information systems in small business and entrepreneurial activities have not been sufficiently studied. In particular, it is necessary to clarify issues related to optimization of business processes of small and medium-sized enterprises, increasing the efficiency of business management with the help of modern information technologies, and supporting small and medium-sized businesses in terms of comprehensive information provision at the republican level. The lack of scientific developments on the solution of these problems created the conditions for choosing the topic of the dissertation, its goals, tasks, and setting the issue, and determined the priority of its content and form.

Materials and Method. The purpose of the research is to develop a conceptual-practical model of business information based on the development of the theoretical and methodological conditions, laws, rules and regulations reflecting the specific features of the effective use of information systems in small business and entrepreneurial activities, and the formation of the appropriate instrumental and methodological apparatus.

In order to achieve the goals of the research, the following tasks were defined: conducting an analysis of the role of small business and private entrepreneurship in the development of the economy of the Republic of Uzbekistan; study of small business and entrepreneurship environment and factors affecting it; introduction of foreign experience in stimulating the development of small business and private entrepreneurship.

Results and Discussion. The experience of leading countries on the effective use of information systems in small business and entrepreneurial activity shows the high socio-economic importance of small business and the importance of developing criteria for distinguishing small business entities from other business entities in market economy countries.

There are different criteria for classifying small business entities abroad. India's experience is particularly interesting because it shows the results of the efforts of a state that makes a break in its development and enters the group of leading countries of the world in a number of indicators. Small business (SME) is given a leading role in the implementation of modern technologies, solving socio-economic and other important problems. Each of the CIS countries adopted its own legislation on the support of small business at different times, and they differ in their characteristics. There are also differences in the classification of small enterprises by types of economic activity. In a number of countries, restrictions on the amount of annual turnover of small enterprises have been strengthened by law. Russia limits the composition of the authorized capital. In Armenia and Uzbekistan, the concept of "micro-firm" was introduced with a difference in the number of employees.

The ease of starting a business activity is one of the main factors of the increase in the number of entrepreneurs, therefore, the economic growth of the country. In countries where it is easier to start a business, the economy is growing faster than in countries where it is necessary to collect many certificates and permits to open a business. A peculiarity is that the poorest countries in the world have the most difficult procedures for starting a business. Due to the urgency of this problem, the World Economic Forum annually includes a separate study in its major report "Global Competitiveness Report", in which countries are compared with each other in terms of the number of days required to open a legal entity (time to start a business). We decided to take this list out of the scope of the report and consider it not as one of dozens of factors affecting the attractiveness of the country's economy, but as a separate object. So, below you can see the list of countries of the world according to the time it takes to open a business. In front of each country, it is indicated how many days you need to spend to open a legal entity. As you can see, in some countries it takes only one day to register an enterprise, while others have to spend more than 100 days to open their business.

Table 1.

Analysis of the ranking of countries on the day to the opening of business entities, ICT development, level of internet freedom

lea o:	Rating of the day ding to the opening f business entities	The n coun	tost convenient for business try ranking (GDP growth %)	T int	'he cheapest ernet network	Ra acco I	nking of countries rding to the level of CT development	Ran	king of countries ac of Internet i	cording to	o the level
No	Country	No	Country	No	Country	No	Country	No	Country	Access proble ms	Content Restricti on- lari
1	New Zealand	1	England	1	Israel	1	Iceland	1	Iceland	25	34
2	Canada	2	Sweden	2	Kyrgyz-ton	2	South Korea	2	Estonia	25	32
3	Hong Kong	3	Hong Kong	3	Fiji	3	Tsarina Shwe	3	Canada	23	32
4	Singapore	4	Netherlands	4	Italy	4	Denmark	4	Costa Rica	20	33
5	Georgia	5	New Zealand	5	Sudan	5	England	5	Taiwan	24	31
86	China	49	China	17	China	80	China	70	China	8	2
90	India	63	India	28	India	134	India	41	India	11	21
23	Kazakhstan	65	Kazakhstan	20	Kazakhstan	52	Kazakhstan	54	Kazakhstan	11	11
-	Turkmenistan	-	Turkmenistan	223	Ethnic group		Turkmenistan	-	Turkmenistan		
59	Kvrgyzstan	108	Kvrgvzstan			109	Kvrgvzstan	37	Kyrgyzstan	13	23
62	Russia	55	Russia	6	Russia	45	Russia	58	Russia	12	10
-	Uzbekistan	105	Uzbekistan	21	Uzbekistan	95	Uzbekistan	59	Uzbekistan	9	12
65	Tajikistan	124	Tajikistan	132	Tajikistan	111	Tajikistan	195	Tajikistan		
	Developed by the a	uthor.				-					

According to Forbes.com (Best Countries for Business) (Best Countries for Business) the most convenient countries in the world to do business. Forbes.com has been ranking the world's worst and best countries to do business every year since 2006. The ranking is led by European countries, which make up two-thirds of the list of TOP-25 countries. About 70 percent of the countries on the bottom list (the most unsuitable for business) are African countries, which are characterized by a high level of corruption, high taxes, difficult mechanisms for obtaining a license to operate, and long procedures for registering a legal entity.

All countries are evaluated on 11 indicators, including the level of corruption, technology development, property rights, government tax policy, investor protection, insurance market development, freedom of speech and entrepreneurial activity. The Forbes rating helps to assess the business environment in the country and the conditions for maximum profit. A 100-point system was used to evaluate the freedom of use of the Internet for business entities in the world . All countries are divided into three conditional groups - "free", "partially free" and "countries with expensive and free Internet" have Internet.

Table 2.

Criterion of integrated assessment of factors affecting the effective use of ICT in small business and entrepreneurial activities in the CIS countries

Quality indicators	Indicator level					
countries with free internet	[0 to 30 points]					
countries with partially free internet	[31 to 60 points]					
countries without expensive and free internet [61 to 100 points]						
Developed by the author.						

The ranking system shows the position of each country in the overall ranking. The higher the overall score, the more unsatisfactory the country's position, correspondingly, the lower the ranking. A detailed description of the rating methodology and the data sources for it were determined based on the factors presented in the Freedom House annual report based on the results of other comparative studies.

In addition, we decided to present the results of the survey conducted by the International Communication Informatization Union in 2020-2021 regarding global scores and country rankings in the field of communication informatization. The table below shows the scores and rankings for each country that participated in the survey. Including the indicator of MDX countries.

Table 3.

Territorial indicators of countries in the direction of the quality of communication information

Name of countries	General indicator	Territorial level
Russia	98.06	1
Kazakhstan	93.15	2
Azerbaijan	89.31	3
Uzbekistan	71.11	4
Belarus	50.57	5
Armenia	50.47	6
Kyrgyzstan	49.47	7
Tajikistan	17.1	8
Turkmenistan	14.48	9
Developed by the author.		

Based on the evaluation indicators shown in the table, "countries with free internet (from 0 to 30 points)" Tajikistan 17.1, Turkmenistan 14.48; "countries with partially free internet (from 31 to 60 points)" Belarus 50.57, Armenia 50.47, Kyrgyzstan 49.47; it was determined that countries without free internet (from 61 to 100 points) have Russia 98.06, Kazakhstan 93.15, Azerbaijan 89.31, Uzbekistan 71.11.

Legal, technical, organizational, opportunities, and cooperative factors were evaluated taking into account measures in the countries mentioned above.

It should be noted that according to the World Bank's report "Doing Business 2018: Reforms to Create Jobs", published on October 31, 2018, Uzbekistan ranked 74th among 190 countries of the world and improved by 13 places.

Our country managed to enter the top ten reforming countries in terms of creating the most favorable conditions for doing business. Table 4. Evaluation indicators of factors influencing the effective use of ICT in small business and entrepreneurial activities in the CIS countries

Countries name	Total score	Legal	Technician	Organizational	Opportunities	Cooperative		
Russia	98.06	20.00	19.08	18.98	20.00	20.00		
Uzbekistan	71.11	19.27	12.56	10.05	15.68	13.56		
Tajikistan	17.10	10.22	0.00	5.63	1.25	0.00		
Turkmenistan	14.48	10.22	0.00	0.00	0.00	4.26		
Developed 1	Developed by the author.							

According to the decision of the President of the Republic of Uzbekistan dated August 13, 2019 №. PR-4417 "On the establishment of the activities of the Small Business and Entrepreneurship Development Agency under the Ministry of Economy and Industry of the Republic of Uzbekistan", it is established that applications for receiving financial assistance from the funds of the "support state fund" will be considered on the basis of electronic documents.

Table 5. Criteria for identifying small business entities in foreign countries

States	Criteria	Micro- firms	Small enterprises	Medium enterprises
	Number of workers	Up to 50 people	From 100 to 1500 people	
USA	Annual income	0.75 mln.dollar up to	10 million _ d o 1 138 mln.dollar up to	1 <u>mird</u> , dollar up to
	Number of workers	up to 10	up to 50	Up to 250
Europe	Merchandise	2 mln.	10 mln. to the	50 mln.
union	turnover	to the euro	euro	to the euro
	Main	2 mln.	10 mln. to the	43 mln.
	tools	to the euro	euro	Up to Euro
	Number of	15	16-100	101-250
Russia	workers	Up to the person	up to a person	up to a person
Federation	Annual income	120 mln. Up to the ruble	800 mln. up to rubles	2 billion Up to the ruble
	Number of workers	100 people	101-250 people	from 250 a lot
Kazakhstan	Annual income EKXK-2269 tenge	up to 30 thousand ECSC	3 min. to the ECSC	from 3 mln many ECSC
Uzbekistan	Annual average number of workers	5-20 up to a person	From 25 to 200 people	-

Developed by the author.

A significant increase in 6 out of 10 indicators of the World Bank experts' report also indicates the scope and effectiveness of the measures implemented to improve the business environment (Figure 2).

If we consider the number of small businesses and private entrepreneurs per thousand people, then we can see that the United States (74 enterprises) is in the leading position according to this indicator.

Table 6.

The role of small business and private entrepreneurship in the economy of some countries of the world

Countries	Small business subjects number (thousand)	Per 1000 people small business the number	In small business of clauses share of total employment (%)	Small of business in GDP percentage (%)				
Great Britain	2930	46	56	50-53				
Germany	2290	37	69.5	50-54				
Italy	3920	68	71	57-60				
France	1980	35	54	55-62				
USA	19300	74	54	50-52				
Japan	6450	50	78	52-55				
Developed by the author based on data.								

In the USA, small businesses and private enterprises ¬make up 99% of all enterprises. The majority of these enterprises are very small, small enterprises, based on family labor. In 80% of all small enterprises, the number of employees does not exceed 10 people.

Italy (68 enterprises) and Japan (49.6 enterprises)

take the next places according to these indicators. The low number of small and medium-sized blind facilities per thousand people in Germany (37 establishments) is due to the unification of East and West Germany. ¬It is known that small business did not develop in East Germany after the Second World War. Currently, a number of measures are implemented by the government to develop small business and private entrepreneurship in Germany.

As we mentioned above, small business and private entrepreneurship perform important socio-economic tasks in the economy \neg . One of the most important of these tasks is that small business and private entrepreneurship lead to the formation of a middle class that provides political and economic stability in society. In any society, the middle class of owners has a special place in the development of the economy.

In the system of state support for small businesses and private entrepreneurship, it is of particular importance to provide them with management, technical and informational assistance. Today, all developed countries have consulting services, various courses, and a network of information centers.

In Great Britain, ¬serious attention is paid to the training of specialists in the field of small business and private entrepreneurship. Here are 5 university business schools that are the most prestigious: London, Manchester, Glasgow, Durham and Warwick. 200,000 people graduate from these schools every year.

Is carried out through the system of chambers of commerce and industry. \neg

The annual publication of the World Bank Group "Doing Business" report has been compiled since 2003. It is in the countries of the world:

1) business activity;

2) features of conducting business;

3) evaluates existing restrictions in countries for business.

Evaluates the regulatory standards of private enterprises in the field of business activities during their operation. ¬The conditions and opportunities at the level of doing business of private sector entities were implemented in 108 countries according to five indicators in the initial period. Now the report is being prepared for 189 countries of the world.

When calculating the rating, this criterion was not included as a separate indicator. However, this criterion is taken into account in the rating. Among the remaining 10 evaluation indicators ¬are:

- 1. Registration of enterprises;
- 2. Obtaining construction permits;
- 3. Connection to the electricity supply network;
- 4. Property registration;
- 5. Obtaining loans;
- 6. Protection of minority investors;
- 7. Taxation;
- 8. International trade;
- 9. Ensuring the execution of contracts;

10. Resolution of Insolvency.

Impact on the social development along with the economic assessment of the country. ¬In the last two years of reporting, the priority indicators and their accounting procedure were completely revised. In this, the main attention was focused on: obtaining a construction permit, electricity supply, property registration, contract execution. Labor market regulation took into account the quality of work, sick leave, work without separation

from studies and unemployment factors. The trading methodology has also been revised.

Thus, the 2016 report ¬noted 231 reforms aimed at improving the business environment around the world during 2014-2015. 25 percent of the total number of these reforms correspond to the countries of Europe and Central Asia. Also, Uzbekistan is included in the list of the first ten countries with the highest indicators in the field of improving the business environment of this region. These countries (rest nine of them (Costa Rica, Uganda, Kenya, Cyprus, Mauritania, Kazakhstan, Jamaica, Senegal, and Benin) are the countries that have in any case implemented at least three reforms and risen to the top of the global ranking.

In the early years of independence, ¬private entrepreneurship was almost non-existent in Uzbekistan, but today more than 90 percent of business entities are small businesses and private entrepreneurship entities. More than 56 percent of the gross domestic product, one third of manufactured industrial products, and almost all agricultural products are accounted for by small businesses. It is the private sector that is considered the main source of income growth in our country.

Thus, the results of the generalization of the world experience of state support of entrepreneurship -show that they can be used in Uzbekistan in the following directions: increasing the practical importance of antimonopoly legislation, reducing monopolistic structures, and developing practical measures for the enforcement of monopoly legislation; in the regulation of tax rates applied to small business and private business entities and improvement of the system of tax benefits; in developing proposals and recommendations for financing small business and private entrepreneurship activities; in the improvement and development of the mechanism for providing management, technical and informational assistance to small businesses and private enterprises, etc. According to the information of the ICT company dealing with the global internet network, in 2022 approx. 5.3 billion people, or 66% of the world's population, use the Internet. That's a 24 percent increase since 2019, when an estimated 1.1 billion people went online during that period. However, that still leaves 2.7 billion people offline. The percentage and number of indicators of Internet service users in the world are shown in the following figure 1.



Number of Internet users, billion

Share of Internet users

https://www.itu.int/en/ITU-D/Statistics/Pages/stat/ default.aspx

Figure 1. Indicators of internet service users in the world

All but three countries in the region have improved their ICT Development Index (IDI) scores over the years, which is above the global average of 0.18 points.

The most dynamic countries in the region by IDI rating and value are presented in the table.

The biggest improvements were observed in Uzbekistan (by 0.42 points), Kyrgyzstan and Ukraine (both by 0.31 points). Azerbaijan, which fell by 0.05 points, overtook Moldova and became the only country to drop in the regional ranking. E ng big improvements we can see Uzbekistan and Moldova according to the index, and Uzbekistan and Kyrgyzstan according to the usage index.

As in many other regions, the most significant improvement of any individual indicator in the CIS region was in mobile broadband, which grew by an average of 31.9% over the year.

Table 7.

Analysis of the countries with the most dynamic indicators in terms of IDI rating and IDI value in the CIS region in 2020-2021

		IDI rating		IDI value (absolute)				
IDI level 20 21 Region rating indicator		State name	IDI level	IDI level 20 21	Region rating indicator	State name	IDI level	
95	9	Uzbekistan	8	95	9	Uzbekistan	0.42	
59	4	Moldova	4	109	10	Kyrgyzstan	0.31	
109	10	Kyrgyzstan	1	79	8	Ukraine	0.31	
32	1	Belarus	0	59	1	Belarus	0.26	
				59	4	Moldova	0.25	

Source: International Telecommunication Union (ITU).

Belarus is the only country that shows the characteristic rounded shape of countries at the top of the overall distribution, scoring relatively high across the board.

Figure 2 shows the relative uniformity of IDI indicators in the CIS region. Belarus is the only country near the top of the overall distribution, showing the characteristic rounded pattern of countries with relatively high scores on all indicators, although its scores are significantly lower than those of the top-ranked countries in Asia and the world. This figure increased significantly in Kyrgyzstan and Armenia. In Uzbekistan, there has been a significant increase in the indicators of connection to broadband and mobile cellular communication, as well as in the indicators of international Internet bandwidth per Internet user. Figure 2 shows spider diagrams showing the top, middle, and bottom countries of the regional distribution, and the top, bottom, the most dynamic countries in the region in terms of IDI value. In Figure 2, the spider diagram shows the relative uniformity of IDI indicators in the CIS region.











subscriptions

subscriptions









Developed by the author based on data.

Figure 2. 2020-2021 analysis of changes in ICT quality indicators in some CIS countries.

Belarus has the largest fixed broadband connection in the region, with 33 subscriptions per 100 inhabitants. The fixed broadband market in Belarus is highly concentrated, with more than 75 percent of subscriptions to the stateowned incumbent Beltelekom.

Belarus is also characterized by a high penetration of landline phones (49 subscriptions per 100 inhabitants), which has been stable in recent years.

Moldova, in the upper middle quartile, shows the same characteristics, but has significantly lower rates of landline and fixed broadband subscriptions and higher education enrolment.

Its weaker performance in terms of fixed connections is also shown in the graphs for Georgia and Ukraine, which are below the upper middle quartile, and especially for Uzbekistan and Kyrgyzstan, which are in the lower middle quartile. However, these two countries exhibit significantly higher IDI values than countries in the L CC quartile.

Among these countries, Belarus shows a significant improvement in all penetration and usage indicators, except for fixed-line phone subscriptions, where it saw a significant decline and a small increase in mobile cellular subscriptions. The biggest improvements in Moldova came from the indicators for Internet users and households with Internet access. In the other four countries illustrated, mobile broadband subscriptions are contributed by other indicators.

Uzbekistan was among the most dynamic countries in the region both in terms of IDI value and rating.

Like most of the dynamic countries in other regions, it improved its performance on the utilization sub-index significantly (by 22 percent) compared to its performance on the access sub-index. These improvements, in turn, were driven by significant improvements in mobile broadband and mobile cellular subscriptions, but the country's ratio of broadband to fixed phone subscriptions and internet users improved significantly. Five MNOs are competing in Uzbekistan's mobile market and their focus is shifting from regular mobile service to mobile broadband. In fact, five MNOs have launched LTE services and are expanding 3G and LTE coverage in the country, covering 45 and 17 percent of the population, respectively. The reallocation of the 900/1800 MHz radio frequency bands in the first half of 2017 is expected to further strengthen the deployment of the LTE network.

2020

2020

Conclusion. As a result of the study of the theoretical, scientific-practical and methodological issues of effective use of information systems in small business and entrepreneurial activities and organizational-economic mechanisms of system development, the following conclusions were reached:

-researching, analyzing and dividing the data into groups related to the issues of effective use of information systems in small business and entrepreneurial activities, allowing to clarify the concepts and essence of entrepreneurship being analyzed in terms of researching the problems of applying the information communication system in the formation of the entrepreneurial environment;

foreign experience of effective use of information systems in small business and entrepreneurial activities and methods of evaluating the level of ICT competitiveness including quantitative and qualitative indicators and criteria at the international level were proposed;

- the ability to effectively use information systems and the structural and organizational-economic mechanism of business management in small business and entrepreneurial activities, the possibility of achieving the expected goals is created by justifying the possibilities, means, goals, planning stages and parameters of rational solutions and measures.

Summarizing the theoretical and methodological characteristics and aspects of the comprehensive study of the effective use of information systems in small business and entrepreneurial activity, the means of state regulation of the conditions necessary for the development of ICT in entrepreneurial activity require the use of organizational, production, marketing and socio-economic factors.

References:

1.https://data.worldbank.org

2.https://sdgs.un.org/un-system-sdg-implementation/international-telecom munication - union-itu-24522 International Telecommunication Union

3. Perovic, V., Nerandzic, B., Bojanic, R., Živkov, E., & Bulatovic, B. (2013). Influence of controlling the investment projects in ERP(M) with primary focus on the cash flow in the company. Metalurgia International, 18(SPEC.4), 145-151

4.Scherer, M. (2017). Management of reverse logistics processes with Microsoft Dynamics NAV. Production Engineering Archives, 15(15), 11-14. https://doi.org/10.30657/pea.2017.15.03

5.Scherer, M. (2017). Management of reverse logistics processes with Microsoft Dynamics NAV. Production Engineering Archives, 15(15), 11–14. https://doi.org/10.30657/pea.2017.15.03 6.Schwade, F., & Schubert, P. (2018). The ERP challenge: Developing an integrated platform and course concept for teaching erp skills in

universities. International Journal of Human Capital and Information Technology Professionals, 9(1), 53–69. 7.Daske, H. (2006, April). Economic benefits of adopting IFRS or US-GAAP - Have the expected cost of equity capital really decreased. Journal of Business Finance and Accounting. https://doi.org/10.1111/j.1468-5957.2006.00611.x

8.Laguna, M. A., Marqués, J. M., & García, F. J. (2003). DocFlow: Workflow based requirements elicitation. Information and Software Technology, 45(6), 357–369. https://doi.org/10.1016/S0950-5849(03)00031-4

9. Cready, W. M. (2008). Discussion of "Accounting Premium" for IAS/IFRS and U.S. GAAP Vis-à-vis German GAAP". International

Journal of Accounting. Elsevier Ltd. https://doi.org/10.1016/j.intacc.2008.09.006 10.Petrochenkov, A. B., Khudorozhkova, M. A., & Lyakhomskii, A. V. (2017). Technological docflow for vendors of energy and automated products: Information system and study case. In Proceedings of 2017 IEEE 6th Forum Strategic Partnership of Universities and Enterprises of Hi-Tech Branches (Science. Education. Innovations), SPUE 2017 (Vol. 2018-January, pp. 44-47). Institute of Electrical and Electronics Engineers Inc. https://doi.org/10.1109/IVForum.2017.8246046

11. Jalal, A. N., Bahari, M., & Tarofder, A. K. (2021). Transforming traditional CRM into social CRM: An empirical investigation in Iraqi healthcare industry. Heliyon, 7(5). https://doi.org/10.1016/j.heliyon.2021.e06913

12.Lawson, J. D. (2003). Putting another "E" in ERP? EDUCAUSE Review, 38(2), 56-57.

CURRENT TRENDS IN THE DEVELOPMENT OF ELECTRONIC COMMERCE AND DIGITAL ECONOMICS

M.Li, PhD in Economics, Head of Management Department, NRU Tashkent Institute of Irrigation and Agricultural Mechanization Engineers,

M.Rakhimova, Assistant of Management Department, NRU Tashkent Institute of Irrigation and Agricultural Mechanization Engineers

R.Romashkin, PhD in Economics, Deputy Director of ECFS, Lomonosov Moscow State University 119991, Russia, Moscow

Abstract

Article dedicated to the modern trends of e -commerce development in the digital economy. The article was written in order to study the e-commerce market at the global level, to identify the problems and prospects of e-commerce development. The theoretical aspects of the e-commerce market were revealed, the world of e-commerce market was analyzed, and the problems and prospects of the e-commerce market development at the current stage were analyzed.

Keywords: : digital economy, e-commerce, e-business, internet, information, e - payments.

Introduction. In the modern world economy, electronic business and electronic commerce based on the use of information and ICT have developed.

Electronic commerce refers to any transaction over an interconnected computer network that, upon completion, involves a relinquishment and transfer of ownership or use of a physical good or service.

E-business, in addition to the use of e-commerce, is the process by which a business organization conducts itself through a network of interconnected computers, which allows connecting individual transactions to a single network to interact with the business environment with the help of navigation software. Information marketing on the Internet creates such an interaction between suppliers and customers, in which the latter takes an active position. Today, the development of electronic commerce is an integral part of large-scale economic reforms implemented in our country. Therefore, due to the adopted laws on the development of e-commerce and the adaptation of the economy to the process of informatization, the decisions of the President and the government, and the created technological foundations, the e-commerce market has been formed in recent years, and the mechanisms serving it are being systematically improved.

In particular, the laws "On Information", "On Electronic Payments", "On Electronic Digital Signature" serve as an important basis for the implementation of reforms in this direction. The current stage of development of electronic commerce is directly related to the adoption of the new version of the Law "On Electronic Commerce" in 2015 at the initiative of the head of our country. This law had a positive impact on the technological and telecommunication development of electronic commerce, and led to the improvement of systematic work on creating favorable conditions for the effective operation of local economic entities.

With the adoption of the law, a number of practical measures were implemented to improve the legal framework related to the future prospects of electronic commerce.

In this regard, the head of our state, Sh.M. Mirziyoev, in the Decree "Strategy of Actions on Five Priority Areas of Development of the Republic of Uzbekistan in 2017-2021", under the third priority area of economic development and liberalization, "Further development of road transport infrastructure, economy, social sphere, management systems" he noted the introduction of information and communication technologies.

Also, in the Decree of the President of the Republic of Uzbekistan "On the development strategy of the new Uzbekistan for 2022-2026" it was determined that "rapid development of the national economy and ensuring high growth rates" are urgent tasks.

Based on this, the development and efficiency of the e-commerce industry in our country, first of all, to familiarize the general public with the laws, requirements and opportunities created in the field, to strengthen the relevant promotion and campaign activities, and to establish effective cooperation between the state, business and non-governmental sectors. We believe that strengthening is important.

Literature review. Economists of the Republic of Uzbekistan and foreign economists contributed to the e-commerce development in the digital economy.

It should be noted that, based on the government's decision, a concept was adopted that defines the main directions of e-commerce development, expansion of the competitive environment, new infrastructure growth and creation of additional jobs, as well as further improvement of e-commerce legislation.

In this sense, studying the implementation of the new law "On Electronic Commerce", identifying and eliminating the existing obstacles in its implementation, and filling the gaps in the legal documents related to the field are among the most urgent issues today.

Russian scientist K.S. Kholodkova gives the following definition of e-commerce: "business processes based on information technologies or sales activities on the Internet". As a narrower concept, the author cites the term "electronic commerce", which defines the process of remote purchase of goods and services through telecommunication networks.

E.S. Kubkina's work "Electronic commerce: role, concept, direction of development" also pays great attention to the term "Electronic commerce". Based on the definitions of a number of foreign and domestic economists, the author gives his views: "in a broad sense, electronic commerce is any economic activity that involves the use of electronic information technologies. In a narrow sense, it is a trading activity to buy/sell goods or services on the Internet for profit.

E.Karayanis and J.Aleksandra's article defines "Electronic commerce" as follows: "Electronic commerce can be defined as a set of transactions for buying/selling tangible and intangible goods and services over the Internet. It includes online retailing, purchasing, online auctions and online payments.

Clearly and fully expresses the essence of electronic commerce. A number of researchers point out that the use of e-commerce methods can be a growth driver for a company and help it overcome periods of crisis.

Electronic commerce refers to the technologies of managing production processes using electronic means of trading and data exchange.6



Figure 1. The total volume of global e-commerce sales, in trillions of US dollars

Consumer confidence in online shopping is increasing worldwide, and according to data, by 2040, 95 percent of purchases are expected to be made online. In 2017, e-commerce was worth 2.3 trillion dollars, and by 2021 it is estimated to reach 4.5 trillion dollars. (Kinsta Managed WordPress Hosting, 2020).

The share of e-commerce in Uzbekistan is not high, its share in the total volume of commerce is about 1%, but despite this, it is developing very quickly due to its advantages. Online stores are convenient and significantly save time for buyers. However, despite these advantages, fraud or inconsistencies in the price and quality of the product (service) may occur. That's why we've put together some helpful information on how consumers can protect themselves when buying a product or service online.

Electronic commerce is regulated by the Law of the Republic of Uzbekistan "On Electronic Commerce".

It was noted that as a result of systematic and gradual state policy in our country, rapid communication was established between state bodies, business entities, individuals and commercial banks, and new information technologies were widely introduced that provide the ability to manage bank accounts through remote control, modern electronic applications and make payments, which, in turn, serves as an important factor in the rapid development of telecommunication infrastructure.

The widespread introduction of information and communication technologies into the economic sphere has initiated a new stage of development of relations between the producer and the consumer in the provision of goods and services.

At the moment, systematic measures are being implemented in Uzbekistan aimed at actively introducing e-commerce into business technology processes and its effective use, providing interactive services to customers through the Internet global network and mobile communication tools. In the conditions of economic integration and globalization, the introduction of electronic payment and electronic commerce in their activities by business entities, in particular, small business representatives and entrepreneurs, is the reason for achieving high economic indicators in the national economy while increasing their competitiveness.

In fact, the new law serves to raise the system of electronic payments to a new level. Because on this basis, a wide path has been opened for high-level digitization of information and communication technologies in our country. It helps to reduce the costs of conducting trade operations, solve problems related to the distance of e-commerce entities from each other, establish direct contractual relations between sellers and buyers, and create a technological market infrastructure that meets international standards.

In accordance with the rules of electronic commerce, approved by the decision of the Cabinet of Ministers of the Republic of Uzbekistan No. 185 of June 2, 2016 "On measures to further improve the procedure for implementing transactions in electronic commerce":

An electronic trading platform is defined as a software-hardware set of organizational, informational and technical solutions, including an internet store that ensures mutual cooperation between the seller and the buyer (customer) through the information system for the sale of goods (works, services).

At this point, it should be noted that a number of issues require special attention regarding the development of e-commerce, the effective implementation of the requirements of the new law "On Electronic Commerce". In particular, practice shows that in e-commerce there are still cases of using paper form when concluding contracts electronically. The main reason for this is that most of the population, including local entrepreneurs, do not have enough information about e-commerce. In e-commerce, there are various misunderstandings in the implementation of contracts after the contract is concluded and in the real situation of the contract, in particular, in the implementation of settlement work. The issue of increasing and supporting the number of information intermediaries with professional trading platforms specializing in various fields and areas for users is also one of the urgent issues today.

For this reason, it is necessary to carry out extensive information work among the public, to train specialists who are knowledgeable in information technologies and sales, to improve the quality of marketing work, to organize courier services that deliver goods to customers, to ensure information security in sales by businesses, thereby providing customers with reliable and guaranteed services. will be a positive impetus to the development of the sector. Also, the need to develop the necessary incentive state programs for entrepreneurs to use e-commerce opportunities and increase their e-economic activity is becoming clear.

Also, the need to develop the necessary incentive state programs for entrepreneurs to use e-commerce opportunities and increase their e-economic activity is becoming clear.

Research methodology. System analysis methods, priority and expert evaluations, and compositional rules were used as research tools.

The analysis showed that the Internet segment of the service industry in the Republic of Uzbekistan, according

to various data, is growing faster than the main national macroeconomic indicators that show the penetration rate.

The calculated multifactor econometric model shows that if the number of Internet users (lnx1) increases by an average of 1.0%, the volume of e-commerce services (lny) may increase by an average of 0.2978% (as a result of the fact that Internet users make such online transactions from online stores result). In Uzbekistan, the cost of Internet service tariffs (lnx2) will increase by 1.0% on average, and the volume of e-commerce services (lny) will decrease by 0.0529% on average. (This inverse relationship is also reflected in the correlation matrix between the factors) (a decrease in the cost of Internet service tariffs, providers will be able to provide more types of services to both e-commerce and Internet users).

It is observed that the number of online stores in our country will increase by 1.0% on average, leading to an average increase in the volume of e-commerce services by 0.1726% (as a result of the increase in online stores, citizens will have the opportunity to purchase household appliances, books, office equipment, construction materials, etc. without leaving their homes. increases). An average increase in e-commerce transactions of 1.0 percent can lead to an average increase in the volume of e-commerce services by 0.4794 percent (in this case, transactions can be distributed among a number of services). Total transactions made through POS terminals can lead to an average increase of 1.0%, an average increase in the volume of e-commerce services by 0.1092% (in which not only sales, but also cash withdrawal operations are carried out).

Plastic cards among the population, an average increase in the number of corporate plastic cards in enterprises by 1.0% can lead to an average increase in the volume of e-commerce services by 0.4851% (citizens or enterprises use electronic payment systems through plastic cards Click, Payme, Unipay and other systems). makes purchases). An average increase in the number of ATMs and infokiosks in Uzbekistan by 1.0% can lead to an increase in the volume of e-commerce services by an average of 0.1999%.

Analysis and result. No country can rationally form and implement its economic policy without taking into account the priorities of the world economy. In particular, the rapid development of information and communication technologies has led to the formation of a new type of economic activity - electronic commerce or electronic commerce, which is inextricably linked with the objective processes of globalization. Electronic networks, especially the Internet, are actively used in the relations between trade organizations and buyers to manage the processes of distribution of goods, monitor the market, develop effective relations with suppliers, business partners and government bodies.

Many factors influence the development of e-commerce in banking and business activities. Indeed, the development of e-commerce is influenced by technological factors, but the technological factor cannot be a fully influencing factor. For example, the growth trend of e-commerce in developing countries is much higher. These countries do not have the same electronic infrastructure as developed countries. It follows that factors other than technological factors have a significant impact on the development of this field. Therefore, the following factors affect the development of electronic commerce.

Technological factors. Currently, almost 90% of the world is equipped with electronic infrastructure.

According to eMarketer, global e-commerce turnover has grown steadily in recent years, reaching \$2.9 trillion in 2018. By the end of 2019, the global turnover of e-commerce was 3.5 trillion US dollars, by 2023 it is expected to exceed 6.5 trillion dollars. (Figure 2)



Figure 2. Global E-commerce Revenue 2017-2018 and Forecast Analysis 2019-2023 .

Due to the weak digital infrastructure and lack of digital skills in the country, digital commerce is developing slowly in Uzbekistan. For example, the decree of the President of the Republic of Uzbekistan noted the lack of online sales and trading platforms in the Republic.

Despite the existing payment systems (Click, Payme, M-bank, Upay, Humo, Oson, etc.) that allow online payments for mobile payments, Internet, public services, taxes and fees, in 2021 only 55% of account holders will make digital payments made or accepted.

Overall, CAREC (Central Asian Regional Economic Cooperation) performs best in terms of Internet access, with an average of 56% of the population using it. The remaining three indicators have relatively similar indicators and are significantly lower than Internet use.

Currently, a number of factors that have a decisive influence on the development of electronic commerce in Uzbekistan have been formed:

- The need to increase the level of integration of Uzbekistan into the world information-economic processes;

- the need to increase the competitiveness of local products in the world market, to increase the control of economic processes in trade processes, to increase the state budget, to achieve the necessary level of control over trade operations by financial authorities, and to reduce total trade costs;

- having certain developments of banking technologies aimed at providing remote services for interbank and customer transactions;

- availability of technical solutions and means of ensuring cryptographic protection of information and information security of the participants of trade relations (manufacturers, suppliers, buyers, banks, insurance companies, etc.).

At the same time, the commodity markets of our country are characterized by a low level of culture of market relations, underdevelopment of regulatory and legal provision, insufficient development of the information structure of commodity markets, high degree of monopolization of the economy, and underdevelopment of the system of financial and credit relations.

Conclusion. E-commerce increases economic efficiency, which means that e-commerce participants can

give quick possibilities and save a lot of money.

E-commerce is a low-cost method of global information exchange. It provides customers with low cost, low time and convenient service.

A number of factors influence the field of electronic commerce in Uzbekistan. They include the number of Internet users, the value of Internet service tariffs, the number of Internet stores, e-commerce transactions, the volume of e-commerce transactions, total transactions made through terminals, the number of plastic cards, the volume of transactions with plastic cards, the number of info kiosks and a number of other factors can be cited.

Based on the study of the regulatory legal framework for electronic services and electronic commerce, it was determined that the registration of certain orders of various channels, groups and bots on social network sites such as Instagram, Facebook, Twitter, etc. is an integral part of the secret economy.

E-commerce is the implementation of trade activities through electronic means and the creation of demand for goods and services, providing additional services to customers after the trade has been completed, and facilitating interaction between partners.

E-commerce allows you to communicate with customers, product suppliers and customers through the web system, to exchange the necessary documents for the implementation of trade transactions electronically, to control the sale and delivery of goods and services, and to make electronic payments for purchases in every way. It creates an important basis for effective use of opportunities, their further improvement, further development of enterprise activity and economic efficiency.

References:

1. Decree No. PF-4947 dated February 7, 2017 of the President of the Republic of Uzbekistan Sh.M. Mirziyoev "On the strategy of actions for the further development of the Republic of Uzbekistan". "Khalk Sozi" newspaper. 20.01.2017

2. Decree of the President of the Republic of Uzbekistan "On the development strategy of the new Uzbekistan for 2022-2026". 01.02.2022

3. Kholodkova K. S. Analyz rynka elektronnoy kommertsii v Rossii // Sovremennye nauchnye issledovaniya i innovatsii. 2013. No. 10

4. Kubkina Yu. S. Electronic commerce: role, understanding, development //Prostranstvo ekonomiki. 2012. No. 2-2.

5. Chen, Jian. Exploring online retailing strategies: Case studies of leading firms in the US and China. Massachusetts Institute of Technology, 2012. p. 44.

6. Golovtsova I.G., Mirzoev R.G., Yastrebov A.P. Electronic commerce: Uchebnoe posobie / GUAP. - SPb., 2007.S-123
7. Kenjabaev A.T., Jumaniyazova M.Yu. Fundamentals of electronic business.- T.: "FINANCE-ECONOMY".-2008.-77 pages.
8. S.S. Gulyamov, R.H. Ayupov. Basics of digital economy and e-commerce. T.: TMI, "Economy-Finance" publishing house, 2020, 55 pages.

9. Khamraeva S.N., Khasanov Sh.Kh. "Development status and analysis of global e-commerce service" scientific electronic magazine "Economy and innovative technologies". No. 3, May-June, 2020. 3rd p. http://iqtisodiyot.tsue.uz

10. Information economy report 2020-2021, science and technology for development: the new paradigm of ict, prepared by the UNCTAD secretariat, UN, NEW YORK

11. https://consumer.gov.uz/yangilikar/elektron-tijorat-online-harid-qilishda-bazi-maslahatlar/

POSSIBILITIES OF APPLYING THE BEST PRACTICES OF FOREIGN COUNTRIES IN THE DEVELOPMENT OF FISHERIES IN CONDITIONS OF UZBEKISTAN

I.Yunusov – PhD, "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

Abstract

This article analyzes the fishery development of European countries such as Croatia, production indicators of fish products, and the strengths and weaknesses, opportunities and threats (SWOT analysis) of fisheries and aquaculture. In this article, the main prospects and directions of strategic development of fish-farming in European countries are considered. It is shown that the main ways to improve environmental and economic efficiency should be: the development of public policy on rational use, conservation and protection of resource potential of inland water bodies, improvement of organizational and economic mechanisms and modernization of legal framework of fish catch; strategic planning and scientific - technical support of fisheries as a whole. Therefore, suggestions and conclusions on the application of some European countries' experiences in our country are presented.

Keywords: : fish-farming, SWOT analysis, fish farming products, cage fishing, intensive technology, fish species, fish-farming development, economic development of fisheries.

Introduction. European countries such as Croatia has a long tradition in fisheries that enable a source of income year by year for coastal and inland communities. Additionally, to being a source of supply for healthy food, fisheries are mostly crucial for adding value of the coastal tourism. Agriculture includes forestry, hunting, and fishing, as well as the cultivation of crops and livestock production. Fishing represents a relatively small share of GDP (about 0,2 to 0,7%) in the country, but it plays main role in socio-economic lifestyle of numerous people.

Despite the low value fishery enables employment on the islands and the continent, especially in rural sides. In 2015, 1476 persons were employed in the fish processing industry of the country. The fish processing industry recorded to 31 million \in (euro) which covered 3% of total food production. The major products were prepared and preserved sardines, frozen whole marine fish, dried, salted and marinated fish.

In many regions, fisheries and particularly fish farming are tighter connected to the development of rural tourism, since it is one of the big sources of high protein food which is an essential component in the human diet.

Fishing takes place mostly in the Adriatic Sea and it's characterized by multispecies fisheries. The catches consist of small pelagic species such as sardine and anchovy which are approximately 90% of the catches.

In Croatia, 72% of fish is farmed in sea and brackish waters and 28% in freshwater. The most important aquaculture methods are following:

- 67% in cages, entirely farmed in sea and brackish water;

- 25% in ponds, entirely farmed in freshwater [4].

According the source on Operational Program for fisheries [1], the main objectives of the Croatian fisheries policy are:

• strengthening and restructuring of the fishing sector as a whole;

• to provide the long-term sustainable management of fishing resources in accordance with fishing possibilities and competitiveness of producers;

• the development of aquaculture in order to research and using the marine biological capacity with the highest environmental and quality standards;

• improving the processing of fish in order to improve value and payback for the catch and cultured fish products;

• establishing an organization for trade of fish and fish products;

• development of infrastructure and logistical support of the fisheries;

• strengthening organized associations and management of fishing.

Per capita consumption of fish and seafood in Croatia is estimated at 8 kg. Total consumption of fish and fish products per capita is significantly lower than in other Mediterranean countries. Only 3% of Croatia's population eat fish every day, with the average person spending just 840 kuna (110 euros) a year on fish [3].

The market organization of fisheries products in Republic of Croatia is based on cooperatives, buy-off stations and registered first buyers. The Croatian fish & seafood market organization - by sales channel - consists of 4 main channels: retailers, HRI (hotels, restaurants and institutions), wholesalers and the traditional fish market [4].

Materials and Methods. For defining the fishery position and opportunities in Croatia we can use methods like SWOT analysis. The SWOT analysis is based on the evaluation of various factors of Croatian fisheries which present either constraints (internal – weaknesses and external – threat) or favourable factors for the sector (internal – strength and external – opportunities). According to the SWOT we may estimate Croatian fishery development, its challenges and possibilities [1, 2]. As shown in Table 2, the fish farming products of the country in 2016 consisted of 13881 tons, it was 63,1 % higher than previous results in 2013. There was a significant growth in producing of species such as Sea Bream, Sea Bass, and Common Carp: increased to 174,5%, 175,5% and 147,6% respectively in 2016 compared to 2013.

And Meagre production rose dramatically, 7 times rather than 2013. However, there was downward trend in production of some species like silver and grass carps, decreased to 94,3% and 65% relatively. Because of some new diseases and insufficient nutrition problems affected on their development (see Table 1).

			2016 %				
№	Species	2013	2014	2015	2016	relatively to 2013	
1	Sea Bream	2466	3640	4500	4304	174,5	
2	Sea Bass	3014	3500	4500	5291	175,5	
3	Common Carp	2100	2100	2100	3100	147,6	
4	Portion Rainbow Trout	350	361	400	500	143,0	
5	Silver Carp	350	350	315	330	94,3	
6	Grass Carp	200	200	200	130	65,0	
7	Meagre	32	50	70	225	7 times	
8	Turbot	-	-	8	1	-	
	Total Croatia	8512	10201	12093	13881	163,1	

Table 1. Fish Farming Production by Croatia (ton) [10]

Source: Developed by author on FEAP Production Report 2017. European Aquaculture Production Report 2008-2016.]

According to the SWOT analysis we can conclude that fishery sector has a lot of strength sides and opportunities. First of all, suitable environmental and geographical conditions for development of sector are important aspect. The second good side is that there is good cooperation with other spheres such as tourism, industry and science. Another beneficial one is that existing of operational programs which are developed for concrete periods and online platforms (e.g. EUMOFA) for prediction of production. And one of the most important opportunities is that some measures, projects regarding the fishery might be financed by EU funds (Figure 1).



Figure 1. SWOT analysis of fishery sector in European countries [10].

On the other hand, fishery sector of the country has drawbacks like weak points and risks. For instance, outdated technology, lack of marketing strategy and private investments in the sector affect directly to the results of fish production.

Moreover, lack of knowledge experiences from other countries, increased cost of production (equipment, inputs, costs for safety and fuel) and low selling price in local markets are negative factors for the future activities of fishery. Additionally, lack of institutions for business development and existing of fish diseases influence significantly.

Results and Discussion. Croatia has huge opportunities to produce fish and fish products. Looking at this table below, we can see that catches in Croatia recorded to 72 thousand tons, it consisted of 68,8 % out of world total catches. It is shown that it was bigger percentage rather than other Balkan countries. And aquaculture reached at 17.000 tons, its share of the total world production in 2015 was 16% respectively.

The fish farming products of the country in 2016 consisted of 13881 tons, it was 63,1 % higher than previous 66

results in 2013.

There was a significant growth in producing of species such as Sea Bream, Sea Bass, and Common Carp: increased to 174,5%, 175,5% and 147,6% respectively in 2016 compared to 2013. And Meagre production rose dramatically, 7 times rather than 2013. However, there was downward trend in production of some species like silver and grass carps, decreased to 94,3% and 65% relatively. Because of some new diseases and insufficient nutrition problems affected on their development.

The observing of catches and aquaculture production is an important instrument for securing fish stocks available in Europe's large and rich fishing areas. According to the table 3, the total production of fishery products in 2015 recorded about 6,4 million tones. An upward trend was observed, illustrated by a 3,6 % rise of the EU total fishery production between 2008 and 2015 (see Table 2).

Table 2.

Total production of fishery products, 2008-2015 among EU countries [10]

Name of	Total prod	Share of		
Ivame of	tons	EU-28		
country	2008	2015	(%), 2015	
Belgium	22	24	0,4	
Bulgaria	15	19	0,3	
Czech	20	20	0.2	
Republic	20	20	0,5	
Denmark	728	905	14,1	
Germany	251	278	4,3	
Estonia	99	72	1,1	
Ireland	250	272	4,3	
Greece	199	170	2,7	
Spain	1106	1195	18,7	
France	728	661	10,3	
Croatia	65	89	1,4	
Italy	390	340	5,3	
Cyprus	6	7	0,1	
Latvia	158	82	1,3	
Lithuania	160	77	1,2	
Luxemburg	-	-	-	
Hungary	15	17	0,3	
Malta	8	13	0,2	
Netherlands	422	427	6,7	
Austria	2	4	0,1	
Poland	152	221	3,4	
Portugal	231	195	3,0	
Romania	13	16	0,2	
Slovenia	2	2	0,0	
Slovakia	1	1	0,0	
Finland	133	168	2,6	
Sweden	237	215	3,4	
United	768	013	14.3	
Kingdom	/00	915	14,5	
EU-28	6182	6404	100,0	
	Name of country Belgium Bulgaria Czech Republic Denmark Germany Estonia Ireland Greece Spain France Croatia Italy Cyprus Latvia Lithuania Luxemburg Hungary Malta Netherlands Austria Poland Portugal Romania Slovenia Slovakia Finland Sweden United Kingdom EU-28	Name of countryTotal prod tons 1Belgium22Bulgaria15Czech20Republic20Denmark728Germany251Estonia99Ireland250Greece199Spain1106France728Croatia65Italy390Cyrus6Latvia158Lithuania160Luxemburg-Hungary15Malta8Netherlands422Austria2Poland152Portugal231Romania13Slovenia2Slovakia1Finland133Sweden237United Kingdom768EU-286182	Name of country Total production (thousand tons live weight) Belgium 22 24 Bulgaria 15 19 Czech 20 20 Republic 20 20 Denmark 728 905 Germany 251 278 Estonia 99 72 Ireland 250 272 Greece 199 170 Spain 1106 1195 France 728 661 Croatia 65 89 Italy 390 340 Cyprus 6 7 Latvia 158 82 Lithuania 160 77 Luxemburg - - Hungary 15 17 Malta 8 13 Netherlands 422 427 Austria 2 2 Poland 152 221 Portugal 231 19	

ource: Eurostat: Agriculture, forestry and fishery statistics. 2017 edition

Regarding to the countries: total production expanded in Spain (+8,1 %), the United Kingdom (+19,0 %), Denmark (+24,3 %), Croatia (+36,9%) and Poland (+44,8 %), while there was a decline in some EU countries such as Portugal (-15,8 %), Greece (-14,3 %), Italy (-12,9 %) and France (-9,2%).

However, it can be seen that the four largest fishery producers of EU in 2015 were Spain (about 1,2 million tons), the United Kingdom and Denmark (approximately 0,9 million tons each) and France (0,7 million live weight tones). In previous years (2008), these four European

fishery areas accounted for more than half of the total EU production in 2015.

Based on the experience of foreign countries, taking into account the conditions that have arisen in our republic, it is advisable to analyze the significant aspects of foreign experience and, on this basis, carry out the following activities (Table 3):

- to improve the efficiency of state programs for the development of fisheries and aquaculture in the country, a special approach is advisable, taking into account the level of development of fisheries infrastructure, local demand and supply of fish and fish products, and other characteristics;

- practical and innovative projects to develop and improve the efficiency of the fishing industry and aquaculture, the deployment of scientific work on a large scale and increase their efficiency;

- widespread use of the cage (cage) method of growing fish in large reservoirs using the water resources of reservoirs, in order to improve the food supply of the population in accordance with medical standards;

Table 3. Important aspects of foreign experience in developing and improving the efficiency of the fish farming [13]

Aspects of interest for use in fish-farming

1). In the case of fisheries reform (Turkey):

development of the fishing industry and aquaculture, providing them with additional benefits in the tax, insurance, financial and credit systems, increasing food production in the regions and improving the quality of services by creating a favorable investment climate;

- it is necessary to further improve the system for improving the modern knowledge and skills of specialists and technical personnel in the field of fish farming [13].

Conclusions and suggestions. In European countries, 72% of fish is farmed in sea and brackish waters and 28% in freshwater. According to the SWOT analysis, favourable environmental and geographical conditions for development of sector are important aspect. Operational programs which are developed for concrete periods and online platforms (e.g. EUMOFA) for prediction of production are great experiences.

The observing of catches and aquaculture production is an important instrument for securing fish stocks available in Europe's large fishing areas. An upward trend was monitored, 3,6 % rise of the EU total fishery production from 2008 to 2015.

Some EU countries had significant growth in production of fish: total production expanded in Spain (+8,1 %), the United Kingdom (+19,0 %), Denmark (+24,3 %) and Croatia (+36,9%) within this period.

We can suggest the following European experiences in the fishery of our country:

1. It is absolutely vital to realize scientific-innovative projects for the development of fisheries. Implementation of scientific projects and research which are aimed at solving the problems of the sector's development (cage fishing, intensive technologies, acclimatization of new species, modernization of necessary fishing equipments).

2. Increasing the volume of production of fish products in Uzbekistan:

- Expansion of produced fish assortments through acclimatization of new fish species;

- Export of produced and processed new fish species and realization of their sales in foreign markets;

- Introduction of advanced technologies for the processing, packaging and storage of fish products in the regions;

- Improvement of food supply in the production process of fish products, establishment of feed and fertilizer production in the local conditions;

- Strengthening the role of logistics and consulting services in the supply chain;

- Creating an analytical online platform that might be observed the

- improving the food supply of the population through the processing of fish products, acclimatization and breeding of new fish species in the regions to strengthen food security, improve the welfare of the population by ensuring permanent employment and increasing its income;

- further strengthening of state support for the

price changes of fish products and enabled new information about latest technologies and equipments for fisheries;

- Further strengthening the system of personnel training on fisheries in higher education institutions, organization of seminar-trainings and internships for specialists in the foreign countries.

In general, we can conclude that by analyzing the

encourage the opening of fishing farms, finding	with the help of pumps.	S
buyers and farms that have started fishing with	 centralized rearing of fish ify and its supply at 	f
pumps;	low prices prevents the artificial rise in the cost	I
 centralized rearing of fish fry has been established. 	of products in the fish industry.	-
2). A centralized processing of marketable fish has	 It is desirable to establish processing and controlized production of fight food in from 	a
been introduced (Turkey):	centralized production of fish feed in free	S
· centralized production and supply of fish feed has	There are great appartunities for breading fish	C
been established.	· There are great opportunities for breeding rish	t
 cage fish farming is widespread. 	species such as cage fish in cooperation with	S
	this country.	f
3). Fisheries, as well as other branches of animal	In order to minimize the cost of production in	1.
husbandry, have been allocated land for growing	risheries in the ruture, it is desirable to allocate	
fodder crops (Holland, Germany).	additional land for growing fodder crops in	0
() Marketing of Ark markets in the country is	order to improve the feed supply of fisheries.	
4). Marketing of fish products in the country is		1
carried out in the jollowing order:	The maximum application of this experience in	a
 Inve, inozen and processed for local consumption; Cought low quality fish, both fragen and live, are 	our country will achieve high economic	r
- Caught low-quanty lish, both hozen and live, are	efficiency of the fishing industry.	
used as reed in aquaculture production, including		r
5) Referring in the fishing industry (Russia):		S
J). Reforms in the Jishing industry (Russia).	It would be beneficial to introduce subsidies to	Ĵ
aultivistion of attragoon and arminida:	cover a certain part of production costs (for	
 introduction of subsidies to cover certain production 	example, pumping costs) based on the specifics	t
a introduction of subsidies to cover certain production	of the fishing industry.	p
6) In fisheries, great importance is attached to the		i
dy alonmont of aquaculture and the introduction of		
intensive technologies (Creatia):		
 carp fish is considered the main export product and 	 Centralized pellet production can give good 	s f I a s d t s f f c c a n r r s t t F i i i i i i i i i i i i i i i i i
is exported in live and processed form:	results.	e
a mastered the production of granules (concules) as	 For the treatment and prevention of fish 	p
feed.	diseases, it is expedient to involve more foreign	Ĩ
 Faculties and departments have been established to 	specialists and study their experience.	2
train ichthyologists and improve their skills in fish		d
diseases and genetics (at the University of Zagreb)		C
Source: Based on the research of the author.		

Grants and subsidies have been introduced to certain amount of costs to farms that grow fish

Directions for the use of fish-farming in the

republic

· Possibility to support farmers by contributing a

67

experience of countries with advanced fisheries, such as Vietnam, Turkey, Russia, China, Japan, Germany, Croatia, it is advisable to implement important areas for the development of fisheries in our country. Without intensive technologies and methods, it is impossible to increase the volume of fish production, therefore, the current directions of foreign experience and increasing the efficiency of their implementation are today one of the most important issues in this area [13].

References:

1. Operational Program for Fisheries, Zagreb 2008, the Ministry of Agriculture, Fisheries and Rural Development Administration-Fisheries.

2. Feasibility study. Fishery sector in Croatia 2010. www.cronomar.hr.

3. http://www.croatiaweek.com/croats-eating-less-fish/.

4. The fish sector in Croatia. Flanders/Investment & Trade Market Survey. 2016.

5. Eurostat: Agriculture, forestry and fishery statistics. 2017 edition.

6. Report of President of the Republic of Uzbekistan at the meeting of the Cabinet of Ministers dedicated to the results of the country's socioeconomic development in 2015 and the most important priority areas of the economic program for 2016.

7. Yunusov I.O. The main aspects of improving the production efficiency of fish products. "Economics and innovation technologies" journal. № 1, 2017. - P 1-6.

8. Ponomareva O.N. Ways to increase the economic efficiency of reproduction of fish stocks // Bulletin of the State Agrarian University of Krasnovarsk. 2006.- P.35-37

9. S.Umarov Investment and Innovative Development Ways of Water Resources. American Journal of Business, Economics and Management. 2016; 4(6): 170-174.

10. I.Yunusov Foreign experiences on the development of fish-farming: in case of Croatia. № 1(5) 2020, Journal of "Sustainable Agriculture".

-12-15 pp. 11. U.P.Umurzakov, I.O. Yunusov Organizational and economic foundations for the development of fish farming based on intensive technologies. // No1(9).2021 Journal of "Sustainable Agriculture" - 13-18 pp.

12. I. Yunusov, U. Sadullaev The main factors affecting the efficiency of fish production. // №1(5).2020 Journal of "Sustainable Agriculture". - 16-19 pp.

13. Annual report on the practical project "Improving the economic basis of the fisheries in improving the food supply of the country (2018-2020)" funded by Ministry of Innovative development of the republic of Uzbekistan (final report). Tashkent. - p. 355.

REGIONAL ASPECTS OF MATERNAL AND CHILD HEALTH IN UZBEKISTAN

O.Ruzikulova, Candidate of Geographical Sciences, Associate Professor at the department of Geodesy and Geoinformatics, "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

N.Komilova, Professor at the department of Economic and Social Geography, National University of Uzbekistan named after Mirzo Ulugbek

L.Karshibayeva, Dotsent of Economic and Social Geography, Gulistan state university of Gulistan B.Khalilova, PhD student department of "Land resource management", "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

S.Abdivaitova, Teacher of English department at "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

Abstract

The article describes the ecological situation in strengthening the health of mothers and infants in Uzbekistan, the achievements of medicine, ecology, socio-demographic development in the country during the years of independence. During this period, the country has improved its health care system, paid more attention to maternal and child health, as well as reduced the number of deaths of children and mothers under one year of age. It is known that for more than a quarter of a century (1991-2019) the overall mortality rate in the country decreased by 1.2%, or from 6.2 per thousand to 4.9 per thousand per thousand [1]. However, there are still areas with high mortality rates, which can be explained by their location at the transport hub and industrialization. The study and analysis of their regional aspects is one of the important aspects of geographical research.

Keywords: : maternal and child health, population health, medical geography, sustainable development, nosogeographic complexes or nosogeographic complexes, infant and maternal mortality, carcinogens, pesticides, industrial cities, maternal and child health, environmental factors.

Introduction. Human health is one of the most important issues for any period of social development. Indeed, the state of development of any country is determined by the level of health and literacy of the population living in the region. These two indicators reflect the role of states in the world community and their socio-economic potential.

In the context of globalization and fierce competition, the steady increase in population, the incidence of infectious and non-communicable diseases among the population is growing, and international organizations are paying close attention to combating these problems. In particular, the UN Program for Sustainable Development until 2030 emphasizes [2] "the elimination of epidemics of diseases such as AIDS, tuberculosis, malaria, as well as measures to combat hepatitis and other waterborne diseases by 2030"it is given. Implementation of these tasks requires stabilization of the nosoecological situation in arid climates [3].

A number of measures are being taken in the country to further strengthen the health of the population, modernize the health sector, reduce the number of groups and types of diseases, protect motherhood and childhood. Clause 4 of the Action Strategy for the Further Development of the Republic of Uzbekistan for 2017-2021 states [4]: "... ensuring a reduction in morbidity and life expectancy among the population; health care, first of all, to improve the convenience and quality of medical and socio-medical services to the population.

As a clear example of the attention paid to the health and protection of the population in Uzbekistan during the years of independence, in particular, the Year of Healthy Generation in 2000, the Year of Health in 2005, the Year of Sponsors and Doctors in 2006, the Year of Health in 2014 The Year of the Child, 2016 is the Year of the Healthy Mother and Child, and 2021 is the Year of Youth Support and Public Health.

This year's name is an important historical event, which serves as a program for the training of highly spiritual and environmentally friendly personnel. Today, it is important to improve the health of the population, a healthy lifestyle in society and the health of the population, especially maternal and child health.

In recent years, our country has given priority to maternal and child health, spiritual and educational upbringing of the younger generation, social protection and improving its quality.

Extensive reforms have been introduced in the country's healthcare system, with a special focus on providing medical care to the population. As a result of centralized polyclinics, rural medical centers, family clinics and maternal and child health promotion, perinatal screening centers have been established in the regions.

As a result, during the years of independence, maternal mortality per 100,000 live births decreased from 65.3 in 1990 to 21.0 in 2017, while infant mortality decreased from 34.6 per thousand to 11.3 per thousand during the same period.

Maternal mortality is related to a woman's pregnancy and is due to the fact that it occurred or worsened during that period, but regardless of the cause of the accident or accident, during or after the end of the pregnancy. is the death of a woman that occurs during the day [5].

Maternal mortality is estimated at 100,000 live births.

It is known that the overall mortality rate varies between different sexes and ages. This is especially true for mothers and babies. Therefore, the Human Development Index usually takes into account maternal and infant mortality. It is also important to study maternal mortality when studying mortality rates. Maternal mortality rates are higher in relatively low-income countries [6].

During the years of independence, our country has paid special attention to the health care system, including maternal and child health. The proclamation of 2016 as the Year of Healthy Mothers and Children has laid an important foundation for the young generation to grow up healthy. As a result of the measures taken in this direction, from 1992 to 2019, maternal and child mortality in our country has decreased significantly. In particular, the above indicators show a positive change in maternal mortality. It is known that the main causes of maternal mortality are pregnancy and childbirth. The main causes of maternal mortality are bleeding, evening toxicosis, septic complications and extragenital diseases, which require preventive measures in the area.

According to the analysis of the dynamics of maternal mortality in the country, it can be seen that from 1992 to 2017 it changed several times. In 1996, the rate dropped sharply to 20.7 per 100,000 live births, and by 2009 it had risen. The figures for the last year have shown a decline. According to statistics, in 2017, the figure was 21.0. It should be noted that as the number of marriages increases, there is a high probability of changes in maternal mortality in the year following the marriage.

In Uzbekistan, special attention is paid to women, and women's clinics and examinations of women of reproductive age are constantly monitored. Under these circumstances, the observation of maternal and infant mortality poses environmental challenges.

In 2017, maternal mortality in the country was 21.0 per 100,000 live births, with the highest rates in Navoi, Tashkent and Jizzakh regions.

When analyzing the causes of maternal mortality, environmental anomalies in the above regions are relatively common in mothers with chronic anemia, gestosis, acute heart and kidney failure.

Table 1. Dynamics of maternal mortality in the Republic of Uzbekistan

Regions	Compared to 100,000 live births						Chang	
	1992	1995	2000	2005	2010	2015	2017	e index
Republic of Uzbekistan	51,0	32,2	33,1	29,2	21,0	18,9	21,0	0,41
TheRepublicof Karakalpakstan	98,6	50,5	38,8	15,4	26,4	29,0	13,2	0,14
Andijon	42,3	32,0	20,2	21,0	18,3	12,9	11,9	0,28
Buxoro	47,8	27,3	49,0	29,9	23,1	7,6	8,1	0,17
Jizzax	69,2	30,0	29,4	24,8	27,0	25,1	42,0	0,60
Kashkadarya	51,1	28,3	39,9	24,4	14,1	15,3	26,1	0,51
Navoi	52,1	25,2	91,6	49,3	27,2	24,7	29,2	0,56
Namangan	32,4	18,9	27,0	30,7	21,7	8,1	21,2	0,65
Samarkand	35,8	38,4	26,4	17,4	16,0	21,4	22,2	0,62
Surkhandarya	67,3	39,8	24,6	23,9	13,7	18,6	20,0	0,30
Svrdarva	50,6	29,7	21,0	34,8	12,3	5,6	17,0	0,34
Tashkent	31,0	46,9	27,5	43,2	32,8	44,3	32,9	1,06
Fergana	38,6	11,7	22,5	31,7	17,0	12,6	21,2	0,55
Khorezm	44,3	25,4	24,9	41,5	30,6	15,2	10,6	0,24
Tashkentcity	94,7	55,6	63,9	44,6	25,4	25,7	18,5	0,20

 Tashkentcity
 94,7
 55,6
 63,9
 44,6
 25,4
 25,7
 18,5
 0,20

 Source: Based on data from the State Statistics Committee of the Republic of Uzbekistan.

The data in Table 1 show that the regions of the republic differ from each other in geographical features, geomorphological structure, but also in demographic indicators. While the traditions and values of the ancient settlements have been preserved, the way of life of the population in the newly established areas (after the 50s of the XX century) is partially different from them. This has an impact on demographics. Therefore, the maternal mortality rate is low in Bukhara region. This is the result of the study and implementation of effective medical technologies in the region over the past decades.

The introduction of a comprehensive health program for women and children of reproductive age, the opening of special prevention and treatment centers for children and mothers in hospitals, the expansion of access to various modern contraceptives, as well as the importance of the period between children are important factors in improving maternal and child health. 'lib serves.

Article 65 of the Constitution of the Republic of Uzbekistan stipulates that "motherhood and childhood shall be protected by the state." One of the socioeconomic significance of the protection of motherhood and childhood is that more than half of the country's population are women and 61.5% of the population are children and adolescents. In our country, special attention is paid to the health of mothers and children, pregnant women with anemia are able to form a healthy child under the supervision of doctors.In 2013, 49.2 percent of women were enrolled in the case, down from 38.2 percent in 2016. The decrease in maternal mortality, abortion, low birth weight and child mortality is explained by the fact that our region pays special attention to the health of the population through the welfare program.

Mortality rates by age group are used to study the number of deaths and the factors that occur in each age group. The study and analysis of infant mortality, ie infant mortality under one year of age (0-12 months), is very important in the study of population mortality. This is because in many cases, infant mortality is much higher, leading to a higher overall mortality rate. That's why infant mortality is so special [7].

The study of the components of infant mortality also focuses on perinatal, neonatal, and post-neonatal mortality. These periods are different and cover a certain period of time.

The perinatal period covers the period from 28 weeks of gestation to 7 days after birth. Mortality rates are particularly high during this period of infant mortality, with high rates of death due to birth-related illnesses. Mortality in the neonatal period of infant mortality is the period of death in the period from 7 days to 28 days after birth, during which time infant mortality is partially reduced. , caused by certain diseases. The next period is called post-neonatal, which includes the period from 28 days of infancy to 1 year of age. During this time, infant mortality has been studied as a cause of death due to various infectious diseases and accidents.

Another important achievement of the demographic situation in the country in recent years is a significant reduction in infant mortality. If in 1991 the infant mortality rate was 34.6 per 1,000 live births, by 2000 it was 20.2, and in 2017 it was 20.2. Fell to 11.3 people. At the end of 2017, infant mortality in the country decreased compared to the first period of independence, but in Tashkent (17.8), the Republic of Karakalpakstan (15.1) and Khorezm region (14.6) is much higher than the national level.

In Navoi (9.5) and Surkhandarya (9.3) regions, the situation is slightly better than in previous years. Good health care in these areas and a focus on family planning are helping the younger generation to have a healthier world. It should be noted that while some regions have seen a decrease in infant mortality since 1991, others have seen a reversal. In the Aral Sea region, the Republic of Karakalpakstan, Khorezm and Andijan regions still have negative indicators.

It is known that in the past, many children died of infectious diseases and other diseases, but experts say that in 1914, 300 out of every 1,000 live births in Turkestan died, and in some years 600-700 children [8].

In Uzbekistan, it is declining as a result of large-scale advocacy efforts to reduce infant mortality. In some areas, high infant mortality rates are still high due to poor environmental conditions, inadequate access to safe drinking water, and problems with access to health care.

The implementation of preventive measures has a positive impact on the quality of population development. As a result of the efforts made to bring the child into a

healthy world, there is a decrease in infant mortality due to various reasons. This can be seen from the data in Table 2.2.4. However, this figure is much higher than in developed countries, but lower among Central Asian countries. To date, the leading causes of infant mortality are respiratory diseases, perinatal pathology, congenital anomalies, and infectious diseases.

Causal mortality affects all age groups of infant mortality, and is particularly common in children aged 0-1 years, ie infants.

It should be noted that the main part of infant mortality in the country is in the perinatal period. In 2014, perinatal mortality was 59.0 per 10,000 live births, with some regions (Tashkent city and Tashkent region) having a higher rate. In 2016, the situation is expected to worsen. The main reason for this is primarily related to extragenital diseases in mothers, as well as genetic factors, as well as the industrialization of the regions, the density of the transport system and the high demographic capacity.

However, in recent years, the mortality rate for respiratory diseases, acute pneumonia, intrauterine hypoxia, and asphyxia during childbirth has also declined slightly (relative to every 10,000 live births). 27.0). However, the growing number of environmental problems is leading to an increase in the number of babies born with birth defects (10.3). Deaths from birth defects, especially in Tashkent, Fergana and Bukhara regions, account for the highest number of infant deaths due to these causes.

One of the most important groups of diseases that cause infant mortality is infectious and parasitic diseases (3.5 per 10,000 live births). Although the number of infant deaths from these diseases has decreased in recent years, the rates are slightly higher in some parts of the country, including Bukhara and Tashkent.

In general, infant mortality is declining in the regions of the country, but in some regions, such as Tashkent (17.0), Khorezm (15.9), Andijan (15.7) and the Republic of Karakalpakstan (16)., 6) it is distinguished by the fact that it is in a slightly higher position. This is due to the fact that the city of Tashkent and Andijan are the largest industrial and transport centers of the country, and some of the above regions are located in the Aral Sea region, which is in a negative nosoecological situation.

In Uzbekistan, 57% of deaths among children under the age of five occur in the neonatal period, ie in the first 28 days of life. Statistical analysis shows that the causes of death include:

- premature birth;

- asphyxia;

- There are three main causes, such as infections (Figure 1).



Figure 1. Dynamics of maternal mortality in the Republic of Uzbekistan.

Mortality from respiratory diseases, gastrointestinal tract, cardiovascular diseases, chronic liver disease, ENT diseases, and infectious diseases is also common in young children (Figure 2).



According to the UN Global Report on Child Mortality, significant progress has been made in child survival worldwide. Today, millions of children have a better chance of surviving than in the 1990s. However, the report says that despite this achievement over the past two decades, 5.4 million children under the age of five died in 2017 alone. 2.5 million of them did not live more than a month. In Uzbekistan, although significant progress has been made in preventing infant mortality, according to official figures, 57% of infant deaths occur in the neonatal period (within the first 28 days). is happening. "The Uzbek government's efforts to save children's lives are commendable. However, the infant mortality rate in Uzbekistan is still high and this is a matter of concern, as most newborns can be saved, "said Sasha Graumann, UNICEF Representative in Uzbekistan .

Improving the delivery of newborn and maternal health services in the provinces is also important for the country's development. Investing in children's health will reduce poverty and stimulate economic efficiency and growth. Improving the nation's gene pool and changing health indicators for the better begins with maternal and child health. In this regard, the protection of motherhood and childhood has always been in the focus of our government.

In particular, the development of a comprehensive action plan for the protection of motherhood and childhood, including improving perinatal care for pregnant women, reducing maternal, infant and child mortality, congenital malformations and hereditary diseases. One of the most pressing issues today is the prevention of abortions, strengthening the material and technical base of maternity hospitals and children's hospitals, equipping them with modern equipment.

At the same time, the achievements of Uzbekistan in the protection of maternal, child and adolescent health in 2014-2020, further strengthening the reproductive health of the population and the implementation of state programs "Year of dialogue with the people and human interests" child health indicators, maternal, child and infant mortality rates, in particular, the introduction of modern technologies for the treatment and diagnosis of pediatric diseases, improving the system of patronage for women and children, as well as staffing and capacity building Particular attention is paid to improving the situation and the need to develop additional measures.

The following recommendations have been developed to reduce and prevent infant mortality:

- increase women's employment in these areas:

- Provision of pediatricians and gynecologists in these districts:

- Prevention of salt and dust storms and prevention of the population, especially children, pregnant women and the elderly;

- Improving the medical examination of pregnant and women of childbearing age.

Issues related to maternal and child health are of strategic importance in the health care system of our country. The study of their regional aspects requires new scientific research in the field of geography.

Conclusion. In summary, mortality, health, and morbidity rates vary widely in mountainous and lowland areas, desert or ancient irrigated agriculture, or in industrialized, high-urban areas. the study and evaluation of such aspects is one of the main issues of tanatogeography.

Reducing maternal and child morbidity and mortality is one of the most global issues in the world. According to the World Health Organization, Uzbekistan has the lowest maternal mortality rate in Central Asia. Neonatal mortality accounts for 63.6% of all infant deaths. On September 7, 2019, the Presidential Decree "On Measures to Further Improve the Provision of Medical and Social Care to Children with Rare (Orphan) and Other Genetic Genetic Diseases" was adopted. During 2017-2020, it is planned to carry out construction and repair work at 439 facilities, including perinatal centers, maternity complexes and primary care facilities, of which 384 (87.5%) facilities were repaired. In Uzbekistan, 57% of infant deaths occur in the neonatal period - the first 27 days of life. These include closer monitoring of maternal health, conditions in maternity wards, medical qualifications, and infant supervision.

References:

- 1. Komilova, N.K., Mukhammedova, N.J., TOJIEVA, Z.N., Nazarov, M.I., & Egamberdiyeva, U.T. (2019) Territorial Definitions of Population Mortality in Uzbekistan ASTRA SALVENSIS, YEAR VII, Supplement no. 1, 619-641
- 2. Agenda in the field of sustainable development for the period up to 2030 // Electronic access: http://www.uz.undp.org/content/Uzbekistan. ru.
- 3. Komilova, N.K., Ravshanov, A.K., Karshibaeva, L.K., Ishankulova, K.Q., & Madrahimova, Z.N.(2020) Some theoretical and practical issues of medical geographical research. Indian Journal of Forensic Medicine and Toxicology. 14(3) 2086-2092. 4. Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No. PD-4947 "On the Action Strategy for the Further
- Development of the Republic of Uzbekistan for 2017-2021"
- Tulchinsky T. G., Varavikova E. A. Health care. Foundations of a new science. Part I. T.: 2003. B-217.
 Komilova, N.Kh., Mukhammedova, N.J., Abdalova, Z.T., Nazarov, M.I., &Kurbanov, P.R. (2020). Separate aspects of the demographic situation in Uzbekistan and its assessment in geographical context. International Journal of Psychosocial Rehabilitation. 24(08) 6773-6792. 7. Komilova, N.K.(2010) Territorial Analysis of Medical-geographical Conditions and the Problems of Health of the Population of the
- Republic of Uzbekistan. Journal of Environmental Science and Engineering. 4(12), 64-68 8. Karakhanov M.K. Non-capitalist path of development and population problems (a socio-economic analysis of the experience of the Central Asian republics in solving population problems) (manuscript) Diss. for the degree of Doctor of Economics. T., 1977.C-275-277.
- 9. Komilova, N.K., Oblakulov, H.A. Egamberdiyeva, U.T. Mirzayeva, Sh.K., & Shadieva, N.S.(2020). Some theoretical issues of social geographical research. ASIA LIFE SCIENCES Supplement 1 (1): 1-10, 157-170.
- 10. Komilova, N.Kh., Mukhammedova, N.J., Abdalova, Z.T., Nazarov, M.I., &Kurbanov, P.R. (2020). Separate aspects of the demographic situation in Uzbekistan and its assessment in geographical context. International Journal of Psychosocial Rehabilitation. 24(08) 6773-6792
- 11. Komilova, N.Kh., Hudayberganova, R.T, Murtazaev, I.B., Abdinazarova, H.O., & Madaminov, Z.H. (2019). Economic and Geographic Problems of Improvement of Industrial Sectors and Local Structure of Uzbekistan. Journal of Advanced Research in Law and Economics. 10(6(44)),1916-1928
- 12. Komilova, N.K., Karshibaeva, L.K., Egamberdiyeva, U.T., Abduvalieva, Z.L. & Allanov, Sh.Q. (2020) Study of nozogeographic situation and its study on the basis of sociological survey. Indian Journal of Forensic Medicine and Toxicology. 14(3) 2093-2098

13.Komilova, N.K., Ravshanov, A.K., Karshibaeva, L.K., Ishankulova, K.Q., & Madrahimova, Z.N. (2020) Some theoretical and practical

- issues of medical geographical research. Indian Journal of Forensic Medicine and Toxicology. 14(3) 2086-2092.
 14. Komilova, N. K., Haydarova, Ş. A., Xalmirzaev, A. A., Kurbanov, S. B., & Rajabov, F. T. (2019). Territorial Structure of Agriculture Development in Uzbekistan in Terms of Economical Geography. Journal of Advanced Research in Law and Economics, 10(8 (46)), 2364-2372
- 15. Komilova, N. Kh.Turdimambetov, I. R, Ravshanov, A.Kh, Mahmudova, M. J, & Payzieva, M.U. (2020) GEOGRAPHICAL ASPECTS OF THE STUDY OF GLOBAL PANDEMIES. European Journal of Molecular & Clinical Medicine. Volume 07, Issue 0,7 524-529

16. Komilova, N.K.(2010) Territorial Analysis of Medical-geographical Conditions and the Problems of Health of the Population of the Republic of Uzbekistan. Journal of Environmental Science and Engineering. 4(12), 64-68.

20. Williams, L., Quirk, S., Koivumaa-Honkanen, H., Honkanen, R., Pasco, J., Stuart, A., Berk, M., 2020. Personality disorder and physical health comorbidities: a link with bone health? Front. Psychol. 11 article number 602342.

21. Yan, S., Xu, R., Stratton, T., Kavcic, V., Luo, D., Hou, F., Jiang, Y., 2021. Sex differences and psychological stress: responses to the COVID-19 pandemic in China. BMC Pub. Health 21 (1). doi:10.1186/s12889-020-10085-w.

^{17.} Moghadas, S., Shoukat, A., Fitzpatrick, M., Wells, C., Sah, P., Pandey, A., Galvani, A., 2020. Projecting hospital utilization during the COVID-19 outbreaks in the united states. Proc. Nat. Acad. Sci. 117 (16), 9122-9126,

Soliev, A., Komilova, N., 2000. Medical geography of arid territories. Des. Dev. Prob. 4, 54-60.
 Widayanti, A., Green, J., Heydon, S., Norris, P., 2020. Health-seeking behavior of people in Indonesia: a narrative review. J. Epidemiol. Glob. Health. 10 (1), 615.
ECONOMIC EFFICIENCY INDICATORS FOR THE DEVELOPMENT OF INTENSIVE GARDENING

O.B. Sattorov - Senior lecturer, "TIIAME" National Research University

Abstract

In this article trends and changes of development of a savdovodstvo and intensive gardening in the region and in the country in general are considered. Are submitted the analysis of the current state of the areas of gardening and their change. The recommendations of an irpedlozheniye about improvement of gardening in the Kashkadarya region and the republic are given.

Keywords: : fish-farming, SWOT analysis, fish farming products, cage fishing, intensive technology, fish species, fish-farming development, economic development of fisheries.

ntroduction. In fact, currently the agricultural is not gotten well efficiently without new technologies. The intensive gardens are also the most effective than traditional method. The researchers are showed that the development of intensive gardening have to be based on agricultural production and efficient use of regional characteristics. Do not forget that the production of agricultural goods is directly dependent at the climate so all processes have been required a long time, for instance farms have to spend minimum six months to get their harvest. However, each fruits have several varieties and if farms can use intensive method they will produce over the during year. These features are important to organized of product marketing processes. Today, specific farms have been established and operate in replace of liquidated collective farms.

Today, specific farms have been established and operate in replace of liquidated collective farms. Most of these are horticulture, vegetable and grain production farms. Unfortunately, all farms are not able to use intensive method as on their activity. That is illustrated that there is going to require deeply reform on the horticulture branch such as other sectors. Actually, in our country has higher opportunity to developed the intensive horticulture. It is worth noting that the proportion of intensive gardening are dramatically increasing year by year. this indicate shows that while the total of intensive gardening was 275.4 thousand hectares in 2018, it has increased 321,2 thousand hectares in 2021 (table 1). Furthermore, the government of Uzbekistan has done new decision to develop intensive gardens and diversified farmers. So nowadays a lot farms are going to make new branch such as intensive gardens.

Table 1.

Dynamics of changes in intensive gardening hectares across the country

	The total field of intensive gardens			In particular					
				Farms			Households		
Analysis period (years)	Area 1000 ha ra)	Fertility per ha	Total harvest <u>mln</u> tons	Area 1000 ha ra)	Fertility per ha	Total harvest <u>min</u> tons	Area 1000 ha ra)	Fertility per ha	Total harvest <u>mln</u> tons
2018	275,4	129,1	3,4	167,4	99,0	1,6	81,2	184,8	1,4
2019	281,6	137,5	3,7	175,0	103,9	1,7	86,1	198,3	1,6
2020	278,6	119,3	3,2	160,0	77,1	1,2	85,9	199,4	1,6
2021	321,2	130,6	3,9	179,8	82,5	1,4	86,1	199,7	1,6
Change percentage in 20015-2018	200,8	95,9	111,7	124,4	83,3	87,5	114,8	118,1	114,2

As regards on this table can be seen the intensive gardens area are increasing over the period, at the same time their fertility has being also raised between from the 2018 to 2021 and it consisted of 129,6 centners per hectare. Itis fact that intensive orchards productivity is increasing and furthermore their harvest is going to growth year after year. besides that, intensive gardens do not require more investment than traditional orchards.

Although the intensive orchards fields had been increased until 2018 but their productivities were not higher than nowadays. However, the harvesting intensive gardens are also rapidly increase after 2021 because many farms and households have used new innovation technologies to cultivate plants. There are several reasons how productivities increased. First of all, the government has made new decision to support farms which organized intensive gardens. Secondly, there is becoming market rules and there has been strongly competitive environment on the agricultural markets so which producers are able to get more efficient they will survive on the market. Besides that, the government of Uzbekistan is supporting to fresh fruit and other agricultural commodities export.

While intensive horticulture has been developed in our country but households proportion has not increased and its area do not change on households.at the present, total of production of the intensive gardens have being rapidly raised.as the statistics showed that the volume of intensive gardening production in 2021 was 3.9 million tons, as compared to 2018 it was growth more 200.8% than. Nowadays, intensive orchards are managed by different forms of management which are farms or other type of private form, but all of them gain mean is get much profit table 2.

Increased share of fructiferous orchards has been recovered to invests and farms are having more income. Although, the share of fructiferous intensive orchards has increased in our country that it is all type of farms but this proportion is not same between each type of management. In particular, this indicator has increased significantly in the agricultural enterprises during this period and has ranged from 44.7% to 73.8% in 2018-2021.

Table 2

Change of intensive orchard area in farms of all types over the Republic (thousand/ha)

		•	'	,	
Indicators	2018 year	2018 year 2019 year		2021 year	
By al	ll type of category p	roducers			
Total field	266,4	279,6	271,6	319,2	
Fructiferous gardens	214,3	214,3 226,2		222,5	
Percentage of total area, %	80,4	80,9	81,3	81,7	
By	the agricultural ent	erprises			
Total field	20,8	23,5	28,7	62,3	
Fructiferous gardens	9,3	10,4	14,8	15,3	
Percentage of total area, %%	44,7	44,2	51,5	73,8	
	By the farms				
Total field	165,4	172,0	159,0	172,8	
Fructiferous gardens	127,3	134,1	124,9	125,7	
Percentage of total area, %	76,9	77,9	78,5	79,7	
By th	e dehkan farms (ho	useholds)			
Total field	80,2	84,1	83,9	84,1	
Fructiferous gardens	77,7	81,7	81,3	81,5	
Percentage of total area %	06.9	07.1	06.0	06.0	

However, the results of farms will increase significantly.

It is worth noting, the best indicators were achieved by dehkan (households) farms. Because, the highest share of fructiferous intensive gardens is managed by dehkan farms (households) and it constituted of roughly 85-90%. Of course, all producers are got more income by intensive orchards because that this method provide to higher harvest account to little resources.

It is important to note that the ratio of product growth rates and productivity growth rates across all categories of farms in 2018-2021 was less than "1.0" for all years except for 2019 table 3. The general situation in the field of gardening in the country remains on both agricultural enterprises and farms. Consequently, the main influence on the growth of harvest capacity is mainly the change in cropland. This is a serious to basis for increasing productivity and seeking opportunities for intensive network development. However, the impact of intensive factors on the development of horticulture in dehkan (households) farms is rather high. That is means the ratio of productivity growth rates and product growth rates is above 1.0. (Table 3).

Thus, according to the forecast of the intensification of the growth of gardening in the region, 4,771 new ones will be created by 2025, of which 1997 will be the construction of gardens.

Table 3.

Expansion of gardens in Kashkadarya region Forecast for the period until 2025

	2	020	1	2025	Total		
Indicators	All gardens	stone	All gardens	stone gardens	All gardens	stone gardens	
Creating new gardens	2118	832	2653	1165	4771	1997	
Creating intensive gardens (hectare)	121	65	213	107	334	172	
Restoration of old gardens	747	483	1096	794	1843	1277	
Planting area (hectare)	80	21	93	37	173	58	
Growing seedlings (thousand pcs.)	2341,6	706,7	3751,8	1074,2	6093,4	1780,9	

Currently, the region allocates land for the cultivation and development of intensive gardening in areas of cotton and wheat. For the effective and timely creation of large gardens with great attention is needed new sowing seedlings in the region. According to him, today in Kashkadarya region will need 6093.4 thousand seedlings. To solve this problem, it is important to increase the number of seedlings growing in the region.[5]

These seedlings are the basis for creating intensive orchards in the region and updating existing seedlings with higher yields and higher quality. Also in 1843 it is necessary to reconstruct the gardens and restore many gardens. These reconstructed and restored gardens are also of great importance for increasing the production of garden products in the region. The key and key factors for the development of intensive gardening are the provision of energy efficient and basic production facilities, as well as the creation of highly productive gardens.

According to the results of the forecast, it can be concluded that the rational formation of intensive gardening and the production of coniferous fruits in most cases determine the economic efficiency of the industry.

In addition, the increase in yields and the growth of gardening in the region due to an increase in the melting of the forecast indicators in the table will ultimately improve the overall horticulture system. The development of the horticultural sector is an incentive to increase the export potential of the region and the country.

Conclusions: In our opinion, adverse changes in the agrarian sphere for these years led to the following negative trends:

- reduction or neglect national fruit trees, especially in the agricultural sector;

- cultivation of forages and berries generally in Dehkan farms;

- low productivity of the grown-up products;

- sluggishness in creation of new gardens and outdated long-term gardens;

- Reduction of the state support of gardening;

- Wear and wear of material and technical resources of storage and processing in fruit and berry farms.

Only from 1995 for 2008 the area of gardens was reduced on 58,000 hectares or for 54.2% up to 27.2 thousand. Or 58.5% of all types of farms. By 2006 farms of shirkat were the main producers of fruit and berries, and their share exceeded 55%. Nevertheless, elimination of shirkat and transformation of farms, agricultural firms and other agricultural enterprises led to neglect, anormaly and reduction of many gardens.

References:

1. [FAO] Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, World Food Program, The State of Food Insecurity in the World 2015, 2015, Meeting the 2015 international hunger targets: Taking Stock of Uneven Progress, FAO. 2. Tilman D, Blazer C, Hill J, Befort BL, 2011, Global food demand and the sustainable intensification of agriculture, Proceedings of the National Academy of Sciences, 108.

Rockström Jetal, 2017, Sustainable intensification of agriculture for human prosperity and global sustainability, 46-47.

3. G. Martynenko, Intensive horticulture in Uzbekistan, condition and development prospects, Tashkent.

4. Decree of the President of the Republic of Uzbekistan of 29.03.2018 "On Additional Measures for Accelerated Development of Horticulture in the Republic of Uzbekistan'

5. Mirzivoev Sh.M. A comprehensive analysis of the results of socio-economic development of the country in 2016 and a statement by the Cabinet of Ministers of the Republic of Uzbekistan on January 14, 2017, at the session of the Cabinet of Ministers of the Republic of Uzbekistan dedicated to identifying the key priorities and priorities of the economic and social program for the year 2017//, January 16, 2017.

6. www.agro.uz. 7. http://www.stat.uz.

8. http://mineconomy.uz.

APPLICATION OF FOREIGN EXPERIENCE IN THE DEVELOPMENT OF FRUIT AND VEGETABLE CLUSTERS IN UZBEKISTAN

N.Kholmatova – PhD student, "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

Abstract

The article examines the activities of agricultural clusters of foreign countries, and as a suggestion their directions are given, which can be applied to the conditions of Uzbekistan. The importance of clusters in the agri-food market for producers and consumers of products is also substantiated. The directions of development of fruit and vegetable clusters and infrastructure of the modern agro-food market are presented, the realization of which will increase the functionality of the infrastructure, increase the effectiveness of the market as a whole.

Keywords: *clusters, agri-food market, fruits, vegetables, industrial complex, initiation, development, strategy, plan, subsidies, loans, processing and transport infrastructure.development, economic development of fisheries.*

Introduction. The world is driven by progress, and agriculture is not left out. Innovative models launch a system of integration of agricultural and scientific and technical spheres. To make the system more efficient, "smart agriculture" is being created, new models are being introduced.

The Republic of Uzbekistan is rapidly developing in all spheres, agriculture does not remain on the sidelines. It all starts with gradual reforms, which result in a multilayered economy of the country and, accordingly, the accompanying infrastructure.

Agriculture is an important sector of Uzbekistan's economy, accounting for approximately 28.5% of GDP. It employs about 4.2 million people, which is more than 30% of the total employment in the country. The main agricultural crops are cotton and grain, but the abolition of quotas and price controls in 2020-2021 is already actively contributing to the diversification of crops, a gradual transition to the cultivation of other crops, fruits and vegetables. The export of agricultural products provided approximately 9.8% of Uzbekistan's external revenues in 2019.

The solution of the nutrition problem in the field of fruit and vegetable growing is one of the most important branches in the field, rich in vitamins, together with the provision of environmentally friendly products and agricultural has a very wide potential to increase the export potential of the industry. Winter and spring of the year without processing, fruit preservation, availability of market opportunities during the seasons, as well as fruits dried without the use of chemicals, a variety of put on the market in the form of jams, juice concentrates further expands the export potential of the industry.

In the conditions of modernization of the economy in agriculture, the socio-economic development of agriculture in the regions is becoming increasingly relevant. The objective of the modern period of development of the region is to ensure high growth rates of gross domestic product, increase production efficiency and achieve on the basis of this high level and quality of life of the population. Hence, both for Uzbekistan and for other countries, there is a need to activate existing and search for new sources and factors of positive dynamics of economic development. One of these sources is the development of clusters. [1]

Literature review. Many foreign researchers have been engaged in theoretical and practical aspects of the formation and functioning of clusters, including M.Porter, K.Ketels, A.Marshall, P.Drucker, T. Keller, M.Enright, J.Schumpeter and others. Their works reflect certain aspects of the problem, taking into account the peculiarities of countries and regions. In relation to the conditions of Russia, the problem of clusters was dealt with by such scientists as A.A.Migranyan, T.Tsikhan, M.Afanasyev, L.Myasnikova, L.S. Markov, etc.

Materials and Methods. A fruit and vegetable cluster is a spatial agglomeration that forms the basis of the local environment. Such clusters usually consist of Dehkan, household, farms, and medium-sized enterprises, and the central element of their success is concentrated in the forces of social capital and geographical proximity. Another feature of them is that firms are less interconnected than in agro-industrial clusters. At the same time, the regions on the territory of which clusters are formed, as world experience shows, become leaders in economic development, determine the competitiveness of the national economy. At the same time, regions that do not have clusters have obviously the worst economic situation, and in some cases become depressed territories. [4]

The stabilization of economic conditions and economic growth in the regions of Uzbekistan in recent years have created real prerequisites for the formation of clusters. In developed market countries, clusters of enterprises have been created for decades. The core of the cluster was strong enterprises with qualified management and a high level of corporate culture. The inclusion of homogeneous enterprises in the cluster contributed to the adoption of management experience and corporate culture of the basic enterprise – the core of the cluster.

As the practice of developing successful firms and successful economic systems shows, the most flexible form of economic growth is the cluster mechanism. A cluster is an industrial complex formed on the basis of a territorial concentration of networks of major manufacturers, specialized suppliers and consumers connected by a technological chain. In agriculture, a cluster is an association of agricultural producers through cooperation, covering production, processing, sale of products, procurement and credit spheres. Farmers do not work alone abroad; cooperative forms of activity are an integral part of economic life there. Most farmers are members of not one, but 2-3 or more cooperatives - supply, marketing, credit, etc. Western farmers have double protection - state and cooperative. The cluster form of production organization allows farmers to achieve high profitability.

In this regard, the study of the foreign experience of clustering, first of all, of agriculture proper, has not only and not at all theoretical significance, but primarily applied. Since, by establishing the content of the concept of "cluster" through the prism of foreign experience, it is possible to avoid gross mistakes, huge investment losses and accelerate the formation of agricultural clusters taking into account foreign experience, adjusted for Uzbekistan.

World practice shows that in the last two decades the process of cluster formation has been quite active. In general, according to experts, by now about 50% of the economies of the leading countries of the world are clustering.

If we give an example of the nearest regions of the world with a differentiated level of development, then according to the European Cluster Observatory, today in 28 countries of Western and Eastern Europe there are 2,101 clusters in various sectors of the economy with a total of 42 million employees. At the same time, 11.5% of them carry out activities in the agro-industrial complex, giving jobs to 4.5 million people. As follows from the data in Table 1, most clusters function in the national economy of Germany, followed by Italy, Great Britain, France, Poland and Spain - i.e. the largest, economically and industrially developed states. These same states, as well as Romania, the Netherlands and Portugal, outperform other countries by an order of magnitude in terms of the number of employed workers in these clusters. But in terms of the size of the clusters themselves, i.e. the number of workers employed

in them, 2 countries are leading Spain and Lithuania, but this ma also indicate low mechanization of labor. But in terms of the tot number of agro-industrial cluste among European countries, Gree and Spain, Bulgaria and France a leading. However, in two Europea countries - Malta and Luxembour there are no agro-industri clusters at all, due to the fact th the same two countries differ the smallest number of cluste in other sectors of the econom At the same time, Bulgaria an Greece are leading in terms of the share of agro-industrial among the other clusters by a huge marg from other European countries, well as the total number of peop employed in agro-clusters. At the same time, Lithuania, Irelan Romania and Denmark are all the most powerful clusters in the agro-industrial complex with th largest number of workers, be possibly with insufficient machin armament of labor. [5].

At the same time, Denmark among the EU countries is perhaps the most advanced country in agro-industrial clustering, which developed a unified approach to inter-firm cooperation back in 1989-1990 and in which clusters in the agro-industrial complex are already successfully functioning,

where one of the most famous is the dairy cluster "Dairy Vertical". This is due to the fact that traditionally in Denmark animal husbandry has priority over crop production, most of whose products are used for feed, and dairy cattle breeding prevails over meat, pig and poultry farming are also developed.

Clustering has already covered more than 50% of the economies of the leading countries of the world. The first large–scale cluster development programs appeared in the USA in the 1970s and 80s, in Denmark in the 1989-90s, in Austria, Great Britain, Japan in the first half of the 90s, in Finland and France in 1995.

One example of the process of creating clusters is the experience of the Japanese economy, initially based on the creation of a system of subcontracting and subcontracting links between a number of large and a network of medium and small enterprises. A typical large Japanese cluster consists of one relatively large parent enterprise using the services of two or three levels of subcontracting firms, usually located in geographical proximity to it. Instead of vertical integration, independent subcontractors of the first level are linked to the parent company by long-term contracts. Similarly, the connections of suppliers of the first and subsequent levels are established.

Table 1.

The number of active clusters in the agroindustrial complex and other sectors of the economy of some European countries identified by the European Cluster Observatory in 2004-2011 [5]

ay on al rs ce	Some European countries	The total number of clusters in various industries, units.	Total number of employee s in industry clusters, people.	The number of employee s on average per 1 cluster, people.	Number of clusters in the agro- industrial complex, units.	The total number of employees in agro- industrial clusters, people.	The number of employees on average per 1 agro- industrial cluster, people.	The share of agro-industrial in the total volume of industry clusters, %	The share of agricultural workers in the total amount employed in industry clusters, %
an	Austria	87	957724	11008	8	86740	10843	9,20	9,06
·g,	Belgium	65	780712	12011	5	58739	11748	7,69	7,52
al	Bulgaria	48	790239	16463	22	426874	19403	45,83	54,02
at	Great Britain	182	4730155	25990	7	99007	14144	3,85	2,09
in rs	Hungary	59	773979	13118	11	161543	14686	18,64	20,87
V.	Germany	314	6693224	21316	14	371204	26515	4,46	5,55
nd	Greece	80	889570	11120	36	299431	8318	45,00	33,66
ıe	Denmark	30	788929	26298	3	91546	30515	10,00	11,60
ne	Irish	10	346641	34664	1	42713	42713	10,00	12,32
in	Iceland	5	33844	6769	1	4498	4498	20,00	13,29
as le	Spain	151	4488405	29725	35	644854	18424	23,18	14,37
ne	Italy	234	6165837	26350	13	384460	29574	5,56	6,24
d,	Lithuania	9	263535	29282	1	46817	46817	11,11	17,77
so	Malta	9	45738	5082	1	3693	3693	11,11	8,07
ıe	Netherlands	83	1201176	14472	12	96031	8003	14,46	7,99
ie iit	Poland	161	2117813	13154	19	413242	21750	11,80	19,51
ne	Portugal	48	1127298	23485	3	42861	14287	6,25	3,80
-	Romania	92	2236096	24305	16	610510	38157	17,39	27,30
rk	Slovakia	45	429583	9546	3	34296	11432	6,67	7,98
ps	Slovenia	16	218330	13646	1	20545	20545	6,25	9,41
ın h	Finland	34	445534	13104	4	29883	7471	11,76	6,71
to	France	165	4209316	25511	20	501571	25079	12,12	11,92
in	Switzerland	62	790799	12755	2	16673	8337	3,23	2,11
rs	Sweden	65	722136	11110	1	12256	12256	1,54	1,70
re	Total	2101	41857372	19923	241	4518706	18750	11,47	10,80

Discussion and analysis. In Japan, there is the experience of the island of Hokkaido in implementing cluster solutions, where in the first half of the 1990s a Central organization was established to ensure the

development of industrial clusters. [6]

Studies conducted abroad show that clusters stimulate a significant increase in productivity and the introduction of innovations. Companies benefit by being able to share positive experiences and reduce costs by using the same services and suppliers.

As the cluster approach developed, the essence of cluster associations changed and enriched. Thus, in the review of the United Nations Economic Commission for Europe (UNECE) 2008 "Improving the innovative level of firms: the choice of policies and practical tools", as the main characteristics of clusters are highlighted:

- geographical concentration (closely located firms are attracted by the opportunity to save on rapid production interaction, exchange of social capital and learning processes);

- specializations (clusters are concentrated around a specific field of activity to which all participants or authors are related);

- multiplicity of economic agents (the activity of clusters covers not only the firms included in them, but also public organizations, academies, financial intermediaries, institutions promoting cooperation, etc.);

- competition and cooperation (as the main types of interaction between firms members of the cluster);

- achieving the necessary "critical mass" in the size of the cluster (to obtain the effects of internal dynamics and development);

- viability of clusters (designed for the long term);

- involvement in the innovation process (firms and enterprises that are part of the cluster are usually included in the processes of technological productive, market or organizational innovations). [7]

All possible actions are being taken in the EU to increase the innovative potential of the European industry. To this end, several projects have been implemented at the supranational level to develop cooperation between innovation clusters. The EU considers cluster policy as a key tool for improving the competitiveness of industries and regions, increasing innovation potential and economic development in the medium and long term. Industrial policy should also be innovative and contain new, more liberal regulatory instruments that can give industry greater freedom in finding its own technological solutions. [4].

In the Declaration on Strengthening Economic Cooperation in Europe (1997) and the Action Plan detailing it, the formation of new production systems based on networks and clusters is proclaimed as one of the most urgent directions for the development of European cooperation.

There are over 2000 clusters in India, of which 388 are industrial and 1657 are uniting handicraft enterprises. Clusters supply over 60% of the country's export products, and some large clusters produce up to 90% of individual types of products manufactured in India. Indian small enterprises tend to concentrate around large industrial companies, in metropolitan areas or in large cities, where there is a huge consumer market and there are labor resources combined with a developed industrial and social infrastructure. The number of small enterprises operating in various clusters ranges from 40-50 to 1700. The Indian government's approaches to stimulating the growth of export opportunities of clusters in the development of high-tech industries and services are particularly effective. This is facilitated by the state technical policy in combination with close cooperation of central government bodies with regional and local administrations interested in accelerated economic development based on the interaction of large, medium and many small enterprises. [8].

In order to regulate the state policy on innovative development of India, the National Innovation Council was established in 2010. The main tasks of this state body are the creation of innovation clusters.

Within the framework of the Indian Government's cluster policy, which began in 2000, there are 24 programs with more than 1,200 clusters. Within the framework of these programs, about 1.4 billion US dollars were allocated.

Support for the creation of clusters in Poland, including financing, is provided by the State in the person of the Polish Entrepreneurship Development Agency (PARP) under the Ministry of Economy of Poland. Currently, the clusters are subject to the operational programs "Innovative Economy" and "Support for Eastern Poland", which are funded by the state at the expense of EU structural funds. However, despite the fact that business interest in such a form of cooperation as clusters is growing, clusters are developing relatively slowly.

In Kazakhstan, in an effort to diversify the national economy, in 2003 they approved the "Strategy of Industrial and innovative Development until 2015". It is based on the formation of national clusters in the sectors of oil, gas, food and textile industries, construction materials and tourism, engineering, transport and logistics services. The issues of accelerating the development of individual clusters are widely discussed with the public. They became the subject of consideration at government meetings. [4]

The course for the formation of clusters in the Russian economy was taken in 2005. It was from this period that the topic of creating clusters became one of the main leitmotives of both federal and regional socio-economic development programs. For example, in the Strategy for the Development of Science and Innovation in the Russian Federation for the period up to 2015, stimulating demand for innovations and research results, creating conditions and prerequisites for the formation of networks and clusters are named as one of the tasks of economic modernization. [9]

The Concept of Long-term Social and Economic Development of the Russian Federation until 2020 states that the success of the implementation of the innovative scenario of the country's development will depend on the ability of state authorities to provide conditions for further improvement of the institutional environment and the formation of institutional structures inherent in post-industrial society. These conditions include support for cluster initiatives aimed at achieving effective cooperation of organizations – suppliers of equipment and components, specialized production and service services, research and educational organizations within territorial production clusters. [9]

It is necessary to emphasize the peculiarity of the study of the problem of clusters, which consists in the fact that clusters, even in agriculture, are intersectoral formations. Therefore, the criteria for identifying clusters do not have a pronounced industry specificity, but are related to territories, specific conditions where there is a certain geographical concentration of market entities.

Conclusion. An analysis of world practice has shown that the process of cluster formation is very active. According to experts, currently about 50% of the economies of the leading countries of the world are covered by clustering.

Advantages of the cluster:

- access to various resources;

- connections, including horizontal;
- various forms of R&D outsourcing;
- change of entrepreneurial culture growth of trust; - facilitating entry into global chains and networks of

product and technology creation.

Therefore, based on the results of foreign studies of clusters, it is possible to determine the advantages that allow participation in cluster initiatives, and systematize the factors that give the cluster the opportunity to develop successfully, as well as to assess the possible nature of interaction between technology platforms and clusters.

Thus, it should be concluded that the cluster approach covers almost all spheres of life and production, including a wide variety of processes occurring in both production and non-production systems based on the achievements of science and technology. That is why cluster management is aimed at achieving a positive commercial result based on increasing production efficiency.

References:

1. PR-4239 (03/14/2019) - "On measures to develop agricultural cooperation in the fruit and vegetable industry". (https://lex.uz/docs/4242004). 2. PR-4549 (December 11, 2019) - "On additional measures for the further development of horticulture and viticulture, the creation of a value chain in the industry". (https://lex.uz/docs/4641164).

3. RCM-512 - "On measures to create modern seed clusters in the Republic of Uzbekistan". (https://lex.uz/docs/4380613).

 S.F.Pyatkin, T.P.Bykova. Development of clusters: essence, current approaches, foreign experience / Minsk, 2008, pp. 13-14.
D.V.Serdobintsev, O.V.Matveeva, L.V.Sorokina World, European and Russian experience in the development of cluster policy in the agroindustrial complex // Fundamental research. - 2014. - №9-8. - S. 1825-1830.

6. P.S.Rudneva. Experience in creating structural clusters in developed countries [Electronic resource] // Economics of the region. 2007. №18. Part2 Access mode: https://cyberleninka.ru/article/n/.

7. Synopsis of policy Options for creating a Supportive Environment for Innovative Development ECE/CECI/2008/3, Geneva, 9 September 2008. 8. V. Bondarenko Small enterprises in the system of clusters [Electronic resource] // Business for everyone. 2005. №33. Access mode: http://

www.businesspress.ru, free.

9. The concept of long-term socio-economic development of the Russian Federation for the period up to 2020 (http://www.consultant.ru/ document/cons doc LAW 82134/).

REQUIREMENTS ON REGISTRATION OF ARTICLES FOR PUBLICATION IN THE JOURNAL "SUSTAINABLE AGRICULTURE"

• There are published original experimental scientific articles in the journal "Sustainable Agriculture" They are about the sustainability of agriculture during a period of significant decline in water situation and increase of water sources pollution in anthropogenic climate change in the short and long term. There are not published articles that expound individual stages of research, which do not allow us to draw certain conclusions.

• All articles are published in English.

• All data must be accompanied by covering letter, which consists of 500 or fewer words, a summary of the significance of research, author's consent to publication, a number of pictures and tables, support for manuscripts (articles) and additional information. In addition, it should be indicated the current telephone and fax numbers, postal address and e-mail address of the respective author to keep in touch.

• For submitting documents (articles), you must send an electronic version to the editorial office, Brussels classification is necessary. The data should follow the recommendations "requirements for registration..." The authors are fully liable for the originality of the article and its subjective and formal correctness. Articles are presented carefully edited, typed in Microsoft Word and Times New Roman Font (Eurotimes font will not be accepted). (*.doc or *.rtf files) in the font size of 12 Times New Roman with A4 sheet format, after 1.15 interval, the size of the text restrictions: the margins at the top and bottom are 2.0 cm, on the left is 3.0 cm, on the right is 1.5 cm. Manuscripts of articles must be signed by authors and have a stamped reference from the institution where the work is done. It confirms that the materials are published for the first time. Moreover, all authors must submit a certificate (from each scientific institution in which the research was carried out).

• Abstract (summary) is a brief overview of all work, including the scheme, objectives, methods, result, and conclusions from the article. It should describe all significant facts of a scientific article and basic numerical data, including any statistical evaluation. • Abstract (summary) should not exceed 300 words (1-1.5 pages), it should be used as the standard nomenclature. There are not recommended to use

any abbreviations in the title of the article or in the abstract. Keywords should be included.

• When you prepare articles containing experimental data, the following scheme should be adhered to literature review, research objective, methodology, results, and conclusions. A Capacity of experimental articles is 15 pages, including a list of references, pictures, photographs, and tables. The title of the article should be short and understandable.

 About the text: the introduction should contain the main reasons for research, review and analysis of the appropriate literature on the subject of research and the proposed approach or solution.

• The title of the section should be accompanied by some text preceding any heading of the subsection. All headings and subheadings in the article should be on the same level. There should be short headings for each section and subsection. Section headings should be in bold, subsections - in italics. • Data and methods. There all preliminary data, conducted experiments, their degree and conditions of carrying out should be described in detail in this section. All original procedures that were used for the processing of experimental material and all analytical methods used for the evaluation should also

be detailed. The whole methodology should be described if it is original. In other cases, it is sufficient to show the author of the method and mention some special differences. You should also indicate the methods of statistical processing, including the used software. • Results and discussion. The results obtained from the experiments, including their statistical evaluation and commentary, should be presented graphically

or in tabular form, the author must comment on the results and compare them with data published at other places (other authors), results should be written in the past tense. Results and discussion can be combined or given in a separate section. Detailed interpretation of the data should be included in the discussion section, not in the results section.

It is necessary to clearly use capital (uppercase) and lowercase letters and also upper and lower indices in formulas, equations, dependencies, etc. This prevents errors. Mathematical formulas are created as separate objects in the formula editor and placed on center. Formulas referenced in the text must have continuous numbering. The formula number is placed in parentheses near the edge of the right margin. The size of the symbols in the formulas is normal is 14 pt, large is 18 pt, small is 7 pt, small index is 5 pt.

• References: only published or accepted manuscripts (articles) should be included in the list of references. Do not refer to abstracts, conferences or documents that were submitted but have not accepted yet. References should be listed and numbered in the order in which they appear in the text. Also, they should be indicated by a reference number in square brackets, multiple references in one set of parentheses must be separated by commas, for example: [1,5,7,28]. The list of references must be at least 20 names. It should be indicated the surnames and initials of all authors separated by comma. After they follows the year of publication in parentheses, the title of the article, the full title of the journal, the volume and page numbers. The names of the author (s) and year of publication should be listed by including them in the text directly, for example: "... as published by Chertovitsky A.S. (2017) or indirectly with the reference on the name (names) and on the year of publication in brackets (Chertovitsky A.S. and Ramazanov A. 2017), (Mirsaidov M.M. and others 2016). Below you can observe the rules and examples of the design of the list of literature in English. The list of references at the first time serves for tracking the authors' and journals' quotations. A correct description of the used sources at the list of literature is a guarantee that quoted publication will be taken into account at the assessment of its authors' scientific activities, and therefore organization, region, state. By quoting, the journal there is determined its scientific level, credibility, the effectiveness of its editorial council, etc.

The structure of the list of literature n English differs from that prescribed by the Russian GOST. A dash, as well as a symbol // are not used in the description in English.

• Tables and pictures should be presented separately to the text, on a separate page at the end of the article, including their names and used units. The units of physical quantities are given in accordance with the International SI system. The names of chemical compounds, taxonomic names are given in accordance with the international nomenclature. Enables should be made in MS Word format (format. Doc), graphics in MS Excel files (data files, xls), photos in jpg / tiff format (resolution is not less than 300 dpi), all graphics and photos must be numbered, according to the order in which they are included in the text, using Arabic numerals. If any abbreviations are used in the articles first time, they should be explained accordingly.

Each table and picture must have a legend. It means the name along with a description that the reader can find useful for understanding the content. The legends for the tables are placed at the top of the table, the legends for the pictures are at the bottom. The headings of the tables and pictures should be completely descriptive, hidden to the left and bold. For the legend of the table, the first letters in each main word are written with the capital letter, for the legend of the picture the capital letters are written only for the first letter of the first word together with own nouns and adjectives. For example Table 1. Total natural river runoff in the Aral Sea basin (average annual runoff, km3 per year is SIC ICWC estimate) from 2001 to 2016. Picture 1. Areas of irrigated land suspended from the South Fergana Channel. In the text, there are used a small letter for the words "table" and "figure" if they do not appear at the beginning of the sentence.

Tables should be numbered according to the order of the reference and refer to them in the text. The tables should not contain empty graphs, dashes or abbreviated words. The digest of the table is typed in Times New Roman font is 9 pt, the head of the table is 8.5 pt. The digital material in the tables is printed at double intervals, the text of the head and outset is with a single one.

• Footnotes for tables. There are used small English letter for attaching footnotes to certain elements of the table, footnotes are placed below the bottom line of the table in the form of a paragraph (without indents). For general explanatory notes, you must use the "Note" header.

The parameter "Note" can identify the use of an asterisk (for example, one asterisk (*) is in the Syrdarya region (1970) and a double asterisk (**) is for some notations according to CANIIRI (Central Asian Research Institute of Irrigation), from 1980 to 1983.

Color images, figures can be played only in color mode (with a black and white printed version). If during the presentation of the article the author knows that color on the Internet is the preferred method of publication, in this case, there must be presented two files with figures: the black and white version

must be marked for printing, and the color version must be marked online in the picture name file. • Through separate application, there must provide information about the full names of all manuscript's authors, address (telephone, fax, and e-mail), the official name of the institution. The editorial staff reviews all received articles and the period of consideration of the article is 6 months.

• It is expected that the article is written in literate and well readable English. If it is necessary, authors should consult with the interpreter before sending an article. The article will not be checked in detail by the editorial board for the existence of linguistic mistakes. At the same time, the editors reserve the right to reject the article if there is a great number of linguistic mistakes.

• Each article that comes to the editorial office of the journal is sent for consideration to experts of the appropriate profile. As a rule, two experts are appointed for each article. The experts report their conclusions and assessments to the editor-in-chief of the journal, besides that, at least two conclusions must come to every article. Remarks and suggestions of experts are brought to the attention of the article author, after that he makes all necessary chanaes.

A copy of the journal with the published article is not sent to the authors and this journal is distributed only by subscription, the fee is not paid. «Note: Only the author of the article is responsible for the content and information of the article. Editorial staff does not respond to the content of the article!»

Editorial address: 100000, Tashkent, Kary-Niyazov Street, 39. Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, telephone number is (998 71) 237-19-78, (998 71) 237-19-58 E-mail: admin@tiiame.uz, tohir-zs@mail.ru.