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THE USE OF INFORMATION SYSTEMS AS THE MOST IMPORTANT MECHANISM FOR THE USE OF WATER RESOURCES IN UZBEKISTAN

Ibragimova Zamira
Jizzakh Polytechnic Institute (student)
Scientific supervisor Sultonov Akmal

Annotation: This article considers the analysis of agroclusters and the application of modern automated water use systems in the agricultural sector in Uzbekistan using the example of the Jizzakh region to introduce water-saving technologies in the form of agroclusters to save water resources in the region, as well as an insufficient level of education to meet the growing demand for qualified personnel in a modern, technologically rapidly changing world. The issues of effective training that require highly integrated practice-oriented methods for solving water use problems, including water supply and sanitation systems, as well as the use of outdated water use technologies are considered.

Keywords: agrocluster, water resources, tools, clustering of the region, entrepreneurship, profitability, steppe areas, irrigated area, agriculture, automated system, hydro resources, aquatronics, water treatment system, water user associations, analysis, database management system.

Introduction

Clusters first began to develop in Europe and the USA as research and production associations. For example, one company could not make this or that part, assembly or technology. Therefore, she involved other enterprises in the work. In case of successful completion of orders, they were united into a single joint production center, while remaining independent enterprises that retain their know-how and customer information resource base. On this basis, many information technology projects were born. It was the clusters that were able to carry out such complex production projects because they had a powerful scientific base for new developments and the production of radically new products. The successes of clusters in information and communication technologies and in the industrial sphere attracted farmers who successfully united into new centers and jointly defended their interests in world markets.

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Agroclusters in the information society can be listed endlessly. But we will dwell in detail on how the cluster works at the formation stage. To create it, it is necessary to combine the efforts of three participants - enterprises, investors and the state. Enterprises are united into a single holding company, providing financing for certain programs, maintaining agricultural and production infrastructure, and a single service center. Investors come to the already built infrastructure, to whom the agricultural cluster offers various opportunities for investment and equity participation in modern business. The agricultural cluster maintains a control and certification service that strictly monitors the compliance of food products with standards, including global ones. The opening of world markets within the framework of a free trade agreement allowing the reduction of costs for the transition to global standards is extremely important for export-oriented enterprises.

Not only private investors can invest in the project, but also the state, as well as international financial organizations (IFOs), which thus support entrepreneurship in any region. State and international assistance pursues several goals: to adapt domestic products to world standards, reduce unemployment in the regions, and develop competition in the regional agro-industrial complex. It is much more convenient for MFOs and the state to work with agricultural clusters than with each entity individually. In this case, they conduct a dialogue with a single structure, and not with multiple enterprises.

An agricultural cluster project formed according to international standards can receive approval from microfinance organizations that are actively developing programs for regional and small and medium-sized rural businesses. Also, these projects can be financed from local and central as well as from the personal business budget. To develop a cluster, it is necessary to create a reliable chain of three elements: producers - local authorities - educational center. The stronger and more thoughtful this chain is, the greater the chances of receiving help and successfully developing clustering [5].

At the beginning of 2019, specialists from Germany equipped a new hydro laboratory in Uzbekistan. The goal and objectives of this laboratory is to optimally use hydro resources in water-scarce Uzbekistan. The TIA Portal V15.1 system is a new version of an automated system for using hydraulic complexes based on digital technology.

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The above-mentioned automated system operates on software products developed in languages LAD, FBD, SCL.

LAD - (Ladder Diagram) is a relay logic language and allows the basis to be determined by a specialist in the field of water treatment and water purification systems.

FBD - (Function Block Diagram) и SCL - (Structured Text (ST)) carries out projects on a graphical standard basis.

An equipped automated system requires updating the computer fleet in this area to more powerful ones. Because the technology requires at least 5 GB of RAM.

The proposed automated system in the field of water supply to the population allows:

1. Extract water from the source;
2. Purify water to the required volume;
3. Addition of water reagents according to the norm;
4. Determination of the norm of chlorine in tanks.

And in the field of hydroclusters, i.e. in agricultural agroclusters:

1. Water transfer volume;
2. Optimal distribution of water across the regions;
3. Automation of management and organizational work of hydraulic structures;
4. Opening and closing of water locks according to the established schedule on a regulatory basis;
5. Compilation and development of a set of mathematical models allowing for the distribution of water resources.

In the management of hydro resources in Uzbekistan, there is a shortage of professional personnel in the water management complex.

Nowadays, new directions in water resources management are emerging in world practice..

For this reason, specialized universities need current areas and specialties. Based on international practice, we propose “Aquatronics” as a new area of human resources for replenishing hydroclusters in Uzbekistan. Therefore, the system described above is a very important mechanism in the development of a complex of hydroresources. This will ensure the demand for personnel in the field of

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"Management and automation of production and technological processes of hydroresources"

The world's limited supply of fresh water is rapidly turning it into a scarce natural resource. The lack of energy resources, as well as environmental problems, make issues related to water use particularly relevant in the regions. The protection of water resources and optimization of their use are becoming the focus of international and national policy with regulation at various levels of government. The main factors that have a negative impact on the rational use and creation of water resource shortages are the global increase in their consumption, irrational use and pollution. The level of today's education is insufficient to cover the growing demand for qualified personnel in a modern, technologically rapidly changing world. As a rule, theoretical training is available for the components of the specialties. Effective training requires highly integrated, practice-oriented methods for solving water management problems, including water supply and wastewater systems, as well as the use of outdated water management technologies [14].

The existing structure of water resource management in other countries of Central Asia and Uzbekistan leads to the fact that most solutions to problems related to water resources focus on private technological and design solutions, focused mainly on their commercialization. As a result, many problems and contradictions have currently accumulated in the use of water resources in various sectors in the energy sector, agriculture and public utilities..

The materials of the Water Congress, which was held in June 2017 in Moscow, indicate the need to join forces to form a qualitatively new approach to the protection of water resources in accordance with modern environmental safety requirements and environmental standards, ensuring integrated management, which is designed to coordinate water resources in all relevant sectors of management [15]. One of the important main tasks that determine the direction of development of the water management complex is its staffing based on improving the training management system, re-equipping the educational and laboratory base of educational institutions, the formation of new directions and specialties, the development and implementation of new educational standards and training programs that meet the needs development of water management, as well as the creation of a system of incentives to attract and retain specialists with higher and secondary vocational education in the industry [16].

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"AQUATRONICA" = "AQUA" + "ELECTRONICS" Aquatronics is a field of science and technology, based on the systematic combination of knowledge in various fields of science and technology, which allows us to make a qualitative leap in the creation of technological processes of new generations and in the production of the latest types of systems and equipment for rational use of water resources. Combining competencies in the complex sciences of water resources and their use with competencies in the field of computer engineering is necessary for the effective use of modern technologies as a useful tool for solving technical problems in the water sector. Aquatronics creates intelligent systems for water resource management. Since 2000, a new area of specialist training has been formed among international specialists in water resources management - Aquatronics, which synergistically integrates similar disciplines. Aquatronics is based on the methodology of systematically combining knowledge in various fields of science and technology, which connects achievements in modern electronic and computer systems with the creation and implementation of equipment and technological processes of new generations for the rational use of water resources [10].

Results

Let us consider, using the example of one region, the benefits of agroclustering in saving water resources. As you know, the main agricultural regions of Uzbekistan are located in steppe areas.

The volume of water use in the Republic of Uzbekistan on average per year is more than 60 billion m3. Of this, almost 50 billion m3 is used in agriculture. From the above statistics it is clear that the use of agricultural clusters in the republic gives a powerful impetus to the efficient use of water resources in the regions.

On average, about 12 thousand m^3 of water is consumed per 1 hectare of irrigated area in Uzbekistan. At the same time, the total volume of water in Uzbekistan itself is more than 10 billion m^3, and the rest of the water comes from the territory of neighboring states. The reason for this is that most of the territory of Uzbekistan consists of the steppe zone [4].

At the same time, approximately 8 soums are spent on 1 m^3 of irrigated area. In total, 4.2 million hectares of land are currently irrigated throughout the republic. From this it turns out that the state spends 400 billion soums every year only on irrigation of agricultural areas. The water resources of the republic are surface and underground

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waters, which are used for water supply to the rural and urban population, industry, electricity generation, fish farming, and recreation.

Therefore, Uzbekistan is in fourth place in terms of energy resource potential of rivers in Central Asia after Tajikistan, Kyrgyzstan and Kazakhstan.

An analysis of the water resources used in Uzbekistan shows that irrigation of crop areas accounts for almost 90.1% of water.[2] (Diagram -1)

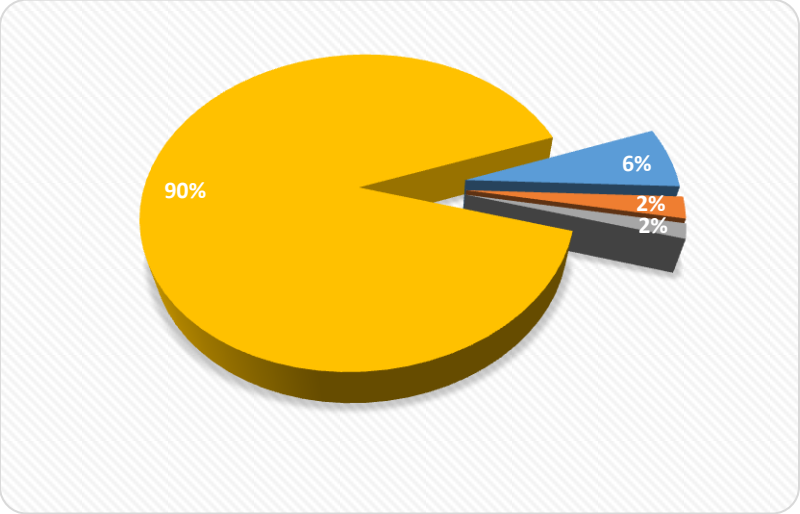

Diagram -1: Distribution of water used resources of Uzbekistan

Discussion and conclusion

In Uzbekistan, Jizzakh region is considered one of the leading agricultural regions. The region has 232 thousand 800 hectares of irrigated land. To prevent waste of water in the region, numerous regulatory documents have been adopted.

In recent years, in order to improve the reclamation condition of irrigated lands, collectors have been built. Through collectors and sewer systems, waste water from fields, industrial enterprises, and livestock farms, containing harmful chemical elements, oil products, and bacteria, is discharged into rivers and lakes. Pollution of rivers and lakes negatively affects the living organisms living in them.[6]

On the territory of the Jizzakh region there is Lake Aydarkul with a total water volume of 44.3 km^3, covering an area of 3478 km^2. The water salinity is 1.5 – 2%. This means that recycling this water does not require large costs. In 2018, together with Czech investors, it is planned to introduce high-tech hydroclusters for water processing, which will provide the irrigated areas of the region with process water. At the same time, the volume of drinking water reserves is increasing. In the future, it is

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planned to increase the level of economical consumption of lake water with the help of newly created hydroclusters. In the conditions of Uzbekistan, the creation of such clusters allows saving water consumption several times. This proves that in 2028, for the first time in Central Asia, together with RosATOM of the Russian Federation, the first and second units of a nuclear power plant consisting of 4 units will be commissioned in Uzbekistan.

Taking into account the above, analyzing the current traditional standard structure, a new modern management structure that meets international standards has been proposed to the Ministry of Water Resources of Uzbekistan.

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