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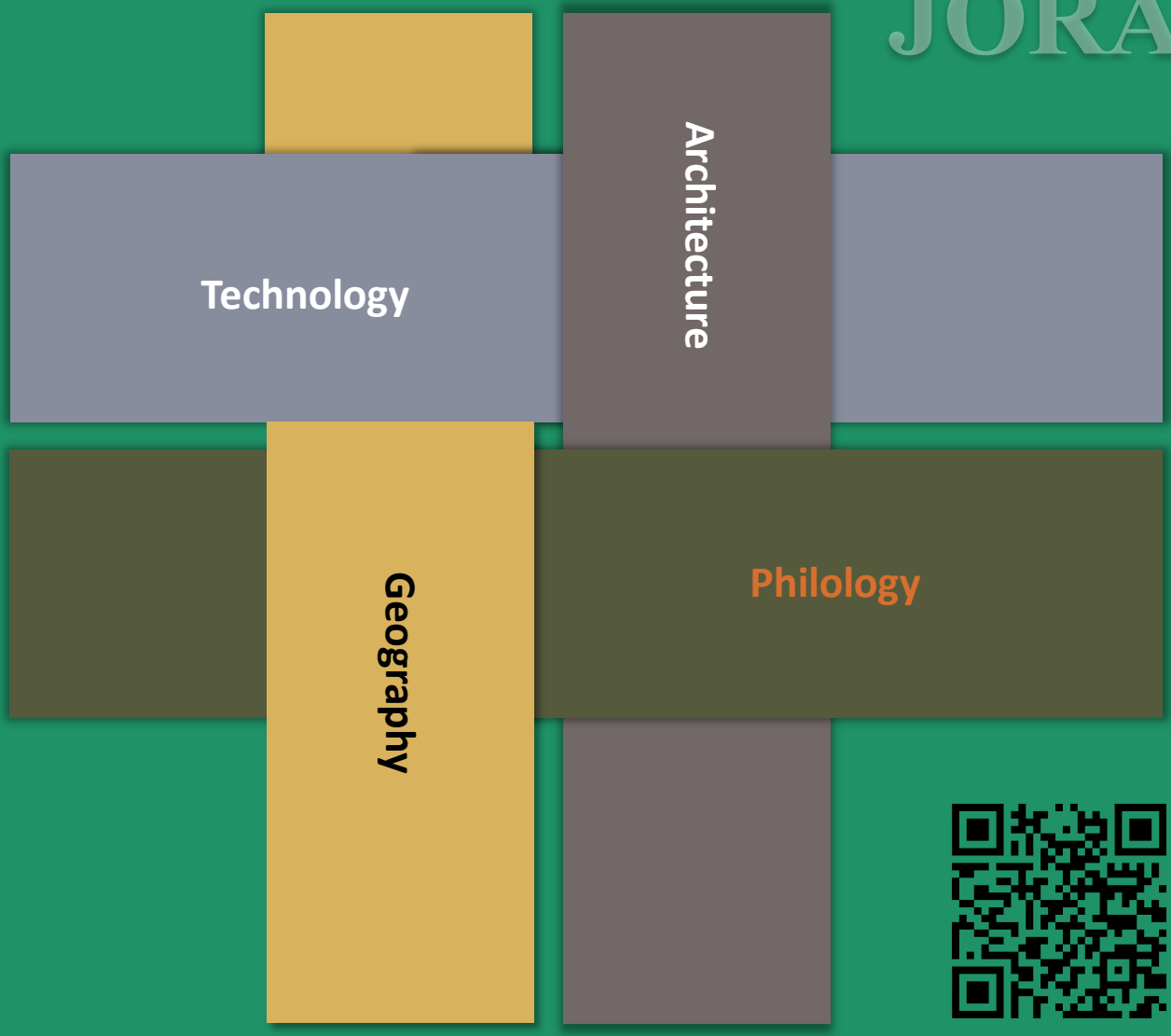

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“**Тадқиқот ва инновациялар**” журнали 2022 йил 22 декабрь куни **№ 054912**-сонли гувоҳнома билан оммавий ахборот воситаси сифатида давлат рўйхатидан ўтказилган.

Мазкур журнал **6 та** халқаро маълумотлар базаларида индексланган бўлиб, жорий йил учун **UIF 2023 = 7.1 “импакт-фактор”** кўрсатгичига эга. Ўзбекистон Республикаси Олий таълим, фан ва инновациялар вазирлиги ҳузуридаги Олий аттестация комиссиясининг 2023 йил 24 июлдаги 01-02/1199-сонли хатига мувофиқ ушбу журналда чоп этилган мақолалар **хорижий мақолалар сифатида тан олинади.**

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ЖУРНАЛ ИССЛЕДОВАНИЯ И ИННОВАЦИИ | JOURNAL OF RESEARCH AND INNOVATIONS

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TRENDS IN THE FORMATION AND DEVELOPMENT OF RAINWAY WATER TREATMENT AND HYDRAULIC STRUCTURES (BASED ON THE EXAMPLE OF UZBEKISTAN AND THE UNITED ARAB EMIRATES)

ANNOTATION

The role of hydraulic structures in the use of rainwater, the history of the formation of ancient water structures such as cisterns, wells, cisterns, as well as scientific solutions for the useof rain and other water resources in Uzbekistan and the United Arab Emirates. Emirates are highlighted in the article.

Key words: Uzbekistan and the United Arab Emirates, Sheikh Zayed Al Nahyan “Green Emir”, hydraulic structures, cistern, well, bell, White water, water mill.

ЁМҒИР СУВЛАРИНИ ТОЗАЛАШ ҲАМДА ГИДРОТЕХНИКА ИНШООТЛАРИНИНГ ШАКЛЛАНИШИ ВА РИВОЖЛАНИШ ТЕНДЕНЦИЯЛАРИ (ЎЗБЕКИСТОН ВА БИРЛАШГАН АРАБ АМИРЛИГИ МИСОЛИДА)

АННОТАЦИЯ

Мақолада ёмғир сувларидан фойдаланишда гидротехника иншоотларининг ўрни, сардоба, қудуқ, чиғириқ каби қадимий сув иноотларининг шаклланиш тарихи билан бирга Ўзбекистон ва Бирлашган Араб Амирлигида ёмғир ва бошқа сув ресурсларидан фойдаланишнинг илмий ечимлари ёритилган.

Калит сўзлар: Ўзбекистон ва Бирлашган Араб Амирлиги, Шейх Заид Аль Нахайян «Яшил Амир», гидротехника иншоотлари, сардоба, қудуқ, чиғириқ, Оқ сув, сув тегирмони.

ТЕНДЕНЦИИ ФОРМИРОВАНИЯ И РАЗВИТИЯ ДОЖДЕВЫХ ВОДООЧИСТНЫХ И ГИДРОТЕХНИЧЕСКИХ СООРУЖЕНИЙ (НА ПРИМЕРЕ УЗБЕКИСТАНА И ОБЪЕДИНЕННЫХ АРАБСКИХ ЭМИРАТОВ)

АННОТАЦИЯ

Роль гидротехнических сооружений в использовании дождевой воды, история формирования древних водных сооружений, таких как цистерны, колодцы, цистерны, а также научные решения по использованию дождевых и других водных ресурсов в Узбекистане и Объединенных Арабских Эмиратах. Эмираты выделены в статье.

Ключевые слова: Узбекистан и Объединенные Арабские Эмираты, Шейх Заид Аль Нахайян «Зеленый Эмир», гидротехнические сооружения, цистерна, колодец, колокол, Белая вода, водяная мельница.

President Shavkat Mirziyoyev congratulated Sheikh Mansour bin Zayed Al Nahyan, who was appointed as the Vice President of the United Arab Emirates, and Sheikh Khalid bin Mohammed bin Zayed Al Nahyan, who was appointed as the Crown Prince of the Emirate of Abu Dhabi [6].

The head of our state warmly congratulated them with these new appointments and expressed his best wishes. The brother wished peace, prosperity and progress to the people of the Emirates.

Figure 1. President of the Republic of Uzbekistan and Sheikh of the United Arab Emirates

The people of Uzbekistan and the United Arab Emirates have valued water for thousands of years, and legends and stories have been formed due to the need for water. In the Tajik language sources, "Siyom - Arabic شیام sawm; ayyomi syyom mohi roza" means fasting on the days of Siyom month, it is used in the meaning of the month of fasting [2].

Due to the need for water in the Kashkadarya oasis, the demand for cisterns and wells was high throughout the historical period.

Sardoba (in Persian-Tajik - cold water) is a domed pond specially built to store water in scarce areas. According to historical data, there were 44 cisterns in Movarounnahr. 29 of them were built in the Karshi desert, 3 in Mirzachol, 3 on the ancient trade route between Tashkent and Fergana, 1 in Rabati Malik near Karmana, and it was used until the end of the 19th century. Cisterns were also built in the following years to provide drinking water to villages and cities. The cistern is still partially used in some steppes of Central Asia [5].

Tajiks living in Qamashi village of Kasbi district are proud of the cistern built in 1892 with personal funds of their grandfather Eshkul Haji. It is said that my grandfather Eshqul Haji asked for permission from the Emir of Bukhara, Muzaffar Khan, to build the cistern. The veneration of water by the inhabitants of the Kashkadarya oasis is connected with ancient mythology and views.

The view of the cistern near the shrine of Mir Haidar Sultan in Kasbi district cannot be found in other areas. The 11th century cistern has an open hole only at the top. According to local residents, ice was stored in cane baskets in the winter season and ice cream called "rohatijon" was invented here. This means that the homeland of ice cream is Uzbekistan.

Figure 2. The cistern built by my grandfather Eshqul Haji in the village of Qamashi, XIX century

One of the ancient traditions dedicated to water was raised to the level of a holiday in Central Asia. It was created when people, who were relieved from the heat, went to the rivers and ponds to bathe on special summer days. The historical roots of this tradition go back to the times when Nowruz was celebrated in the summer, not in the spring as it is now. Abu Rayhan Beruni wrote about it: "On this day, when the morning dawns, people stand in front of the flowing waters in order to be blessed and ward off calamities." they pour water over them... in the Khorezm people, the 10th day of Isfandormaji is a holiday called "Vakhshangom" and it is dedicated to the water of Vakhsh and Jayhun [1].

Such views have been reflected in the life of our country, and there have been watersheds in different regions of Uzbekistan. In particular, a water raft was held for three Wednesdays in the village of Akdarya, Kitab district, Kashkadarya region. This lake is also called "White water" ("Obi safed" in Tajik), "Muddy water" ("Obi loyka"), "Reverse water" ("Obi chappa"). About a month before the date of the water rafting, village elders and activists decided to prepare for it seriously [2].

Nurani of Sevaz village in Kitab District say that water rafting has existed since ancient times. They also link the origin of the name of the village of Sevaz with the Tajik name "Se boz" ("Three players"). They consider the place of love in water sali is high. In the early Middle Ages, the dances of Cashish dancers were also performed in the Chinese imperial court.

Even though the old Afrosiyab fortress is located on a hill, it was supplied with water from a number of canals, ponds, wells, and springs. According to experts such as V.L.Vyatkin, V.V.Bartold, A.Muhammadjonov, Afrosiyab fortress was also watered by Jui Arzis nova. JuiArzis– Persian Juyariq means channel, arziz-tin, lead (Barthold, 1965, p.275). The bottom and sides of the ditch, which was placed on smooth pillars, were reinforced with lead, and flowed from south to north, over the lower part of the defensive wall, and passed over the bazaar. The Jui Arzis may have flowed 10 meters above the aqueduct, as the defensive moat and market square remained below the aqueduct. Another important aspect of this hydrotechnical structure is that the Jui Arzis aqueduct was not built by copying the aqueducts of other regions, the structure was built by the local people based on their experience, and it is contemporary with the Roman aqueducts.

Figure 3. This picture is taken from Asror Nizomov's work "Geography of ancient hydrotechnical structures of Uzbekistan"

The stone mill in the village of Gelon, located in the Kashkadarya region, has been used for a century and is powered by water.

Figure 4. A stone mill powered by water for 100 years. Gelon village

Kol Mountains with an altitude of 4500-4700 m are located around the village of Gelon. Local residents have created a device that supplies electricity to 50 households using canal water.

Figure 5. Anhor water-powered electricity generating device

In Bukhara Emirate, collected rainwater or well water was extracted and used with the help of a bell. The need for water was met with the help of a bell. The following folk proverb is also about the scream:

Under the ground itself,
His power is upon the earth,
thirty two brothers,
On top of each other.

Figure 6. A bell used in Khorezm in the 19th century

In the territory of Uzbekistan, the most rain falls in March-April, and the least in summer. Rainwater can be treated using water filtration equipment.

Figure 7. Rainwater filtration equipment

The best water parks in the UAE. There is no clear answer to the question of which of the water parks in the UAE is better. The water parks in the UAE are amazing.

Figure 8. A water park in the UAE

Agricultural development was very difficult due to limited fertile land and lack of water. Many people believe that some of the oil and gas revenue would be better spent on food. Nevertheless, the government's risk-taking and foresight paid off. The market is full of vegetables and fruits grown in the local fields, the canning industry is supplied with raw materials, and some of the grown products are exported to neighboring countries and Europe.

The United Arab Emirates has grown from a desert on the Gulf coast to a thriving country. Sir Bani Yas Island, located 170 km from Abu Dhabi, belongs to the President of the Emirates, Sheikh Zayed Al Nahyan. He created a Garden City on a desert island. 3 million trees were densely planted here. More than 120 million trees were planted in the United Arab Emirates during the leadership of Zaid, who is called the "Green Emir". Reforms in the United Arab Emirates serve the development of scientific achievements.

We recommend the followings as a solution to the existing problem in the process of scientific research:

Technological achievements: The formation and development of hydraulic structures are closely related to the achievements of engineering and construction techniques. Over time, the introduction of modern materials such as reinforced concrete and steel, the use of advanced geodesy and modeling tools made it possible to build more complex and efficient structures.

Multiple Functions and Integrated Approaches: In recent years, there has been a shift toward designing and building hydraulic structures that perform multiple functions. For example, a dam can be designed not only for flood control, but also for hydropower generation, water supply, and irrigation. Integrated approaches consider environmental, social and economic aspects of water resources management to achieve sustainable development.

Environmental Protection Issues: As the importance of environmental protection is increasing, attention is being paid to consider environmental factors in the design and operation of hydraulic structures. Environmental impact assessments, habitat restoration measures and fish farming facilities are being integrated into the planning and construction process to minimize the ecological footprint and maintain ecosystem balance.

Resilience to climate change: The effects of climate change, including the frequency and intensity of extreme weather events, rising sea levels, and changes in precipitation patterns, pose new challenges for hydraulic structures. Currently, in the formation and development of these structures, the issues of climate change resistance, their ability to withstand and adapt to changing hydrological conditions are taken into account.

Sustainable and nature-based solutions: The advantages of sustainable and nature-based solutions in water management are increasing. These approaches include using green infrastructure, restoring natural watercourses and integrating natural features to enhance flood protection and water treatment. They mimic natural processes and bring many benefits to people and the environment.

Public Participation and Stakeholder Participation: Public participation and stakeholder participation in the formation and development of hydraulic structures is increasing. Involving local communities, indigenous peoples and other stakeholders in decision-making processes is recognized to lead to more inclusive and sustainable outcomes.

In the process of our research, we achieved a number of achievements with the help of modern technologies at the Presidential School in Tashkent. If our scientific recommendations are approved by the UN Conference, we would contribute to meeting the water needs of other countries.

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