HISTORICAL CHANGES IN WATER MANAGEMENT AND SANITATION TECHNOLOGIES IN UZBEKISTAN

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Annotation: This article explores the historical evolution of water management and sanitation technologies in Uzbekistan. It covers key periods, from ancient irrigation systems using ditches and canals to Soviet-era advancements and modern developments. The role of effective water management and sanitation is crucial for sustainable development and public health, particularly in resource-scarce regions like Uzbekistan.

Ancient practices focused on irrigation from major rivers like the Amu Darya and Syr Darya, supporting agriculture and economic stability. Major infrastructure projects included large irrigation systems, reservoirs, and canals, significantly boosting agricultural productivity and improving sanitation.

Recent reforms emphasize modern technologies such as drip irrigation and international collaborations to enhance water management and sanitation. Current efforts focus on water-saving technologies, improved rural water supply, and upgraded sanitation systems to enhance public health and environmental conditions.

Ongoing challenges include resource limitations and outdated infrastructure, with future directions focusing on technology adoption, regulatory improvements, and global cooperation for sustainable development.

Keywords: Water Management, Sanitation Technologies, Irrigation Systems, Soviet Infrastructure, Modern Reforms, Resource Efficiency, Public Health

O'ZBEKISTONDA SUV XO'JALIGI VA SANITARIYA TEXNOLOGIYALARIDAGI TARIXIY O'ZGARISHLAR.

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Annotatsiya: Ushbu maqola O'zbekistonda suv xo'jaligi va sanitariya texnologiyalarining tarixiy evolyutsiyasini o'rganadi. U qadimiy ariqlar va kanalardan foydalanilgan sug'orish tizimlaridan tortib, sovet davrining yutuqlari va zamonaviy

rivojlanishlarga qadar bo‘lgan asosiy davrlarni qamrab oladi. Samarali suv xo‘jaligi va sanitariya roli barqaror rivojlanish va jamoat salomatligi uchun, ayniqsa resurslari cheklangan hududlarda, muhim ahamiyatga ega.

Qadimiy amaliyotlar Amudaryo va Syrdaryo kabi katta daryolardan sug‘orishga e’tibor qaratgan, bu esa qishloq xo‘jaligini va iqtisodiy barqarorlikni qo‘llab-quvvatlagan. Asosiy infratuzilma loyihalari katta sug‘orish tizimlarini, suv omborlarini va kanallarni o‘z ichiga olgan bo‘lib, bu qishloq xo‘jaligi mahsuldorligini sezilarli darajada oshirgan va sanitariya sharoitlarini yaxshilagan.

So‘nggi islohotlar zamonaviy texnologiyalar, masalan, tomchilab sug‘orish va xalqaro hamkorlikka katta e’tibor qaratmoqda, bu suv xo‘jaligi va sanitariya tizimlarini yaxshilashga qaratilgan. Hozirgi tashabbuslar suvni tejash texnologiyalariga, qishloq joylarida ichimlik suvi ta’minotini yaxshilashga va sanitariya tizimlarini modernizatsiyalashga qaratilgan.

Mavjud muammolar cheklangan resurslar va eskirgan infratuzilmani o‘z ichiga oladi, kelgusi yo‘nalishlar texnologiya qabul qilish, tartibga solishni yaxshilash va global hamkorlikka e’tibor qaratish orqali barqaror rivojlanishga erishishga yo‘naltirilgan.

Kalit so‘zlar: Suv xo‘jaligi, Sanitariya texnologiyalari, Sug‘orish tizimlari, Sovet infratuzilmasi, Zamonaviy islohotlar, Resurs samaradorligi, Jamoat salomatligi.

ИСТОРИЧЕСКИЕ ИЗМЕНЕНИЯ В УПРАВЛЕНИИ ВОДНЫМИ РЕСУРСАМИ И САНИТАРНЫХ ТЕХНОЛОГИЯХ В УЗБЕКИСТАНЕ

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Аннотация: Эта статья исследует историческую эволюцию управления водными ресурсами и технологий санитарии в Узбекистане. Рассматриваются ключевые периоды, начиная от древних систем орошения с использованием каналов и арыков, через достижения советской эпохи, до современных разработок. Эффективное управление водными ресурсами и санитария имеют решающее значение для устойчивого развития и общественного здоровья, особенно в регионах с ограниченными ресурсами, таких как Узбекистан.

Древние практики сосредоточивались на орошении крупных рек, таких как Амударья и Сырдарья, поддерживая сельское хозяйство и экономическую стабильность. Основные инфраструктурные проекты включали крупные

системы орошения, водохранилища и каналы, что значительно увеличивало продуктивность сельского хозяйства и улучшало санитарные условия.
Недавние реформы акцентируют внимание на современных технологиях, таких как капельное орошение, и международном сотрудничестве для улучшения управления водными ресурсами и санитарии. Современные усилия сосредоточены на технологиях экономии воды, улучшении снабжения сельских районов водой и модернизации санитарных систем для повышения общественного здоровья и экологических условий.

Существующие проблемы включают ограниченные ресурсы и устаревшую инфраструктуру, с будущими направлениями, ориентированными на внедрение технологий, улучшение регулирования и глобальное сотрудничество для устойчивого развития.

Ключевые слова: Управление водными ресурсами, Санитарные технологии, Системы орошения, Советская инфраструктура, Современные реформы, Эффективность ресурсов, Общественное здоровье

Introduction

Water management is a fundamental factor for the sustainable development of any society. In regions with limited water resources, proper water management is crucial for meeting the needs of agriculture, industry, and the population. Sanitation technologies are aimed at preserving public health and improving living standards. Proper waste management, water purification, and safe drinking water supply are essential for creating a healthy and safe environment. Therefore, effective management of water and sanitation is vital for the sustainable economic development of society, improving public health, and addressing environmental issues.

Uzbekistan is not rich in water resources, so the rational and effective use of these resources is crucial for the country's economic development. Utilizing major rivers like the Amu Darya and Syr Darya has laid the foundation for agriculture, which ensures food security and job opportunities for the population. The development of irrigation systems and the implementation of water-saving technologies are essential for effective utilization of water resources.

Historically, water management in Uzbekistan has always been an important part of society. Since ancient times, cities and villages along the Amu Darya and Syr Darya rivers have actively used irrigation systems. Water was transported through canals and ditches to support agriculture. Over different periods, the management of water resources has evolved, providing a stimulus for economic and social development through new constructions and technologies.

In ancient and medieval times, water management in Uzbekistan relied primarily on irrigation systems through ditches and canals. The transportation of water to remote

areas, particularly the distribution of water from the Amu Darya and Syr Darya rivers, was of great importance. These irrigation systems were developed over centuries by local populations and played a key role in cultivating various crops. They supported irrigation agriculture and ensured connections between cities and agricultural zones.
The Amu Darya and Syr Darya are crucial sources of water resources in Uzbekistan, and extensive use of these rivers for irrigation has been well-documented. In ancient times, irrigation systems were established by transporting water through ditches and canals to meet the needs of local agriculture. Effective use of the Amu Darya and Syr Darya led to the development of irrigation agriculture in regions such as the Turan Basin and the Fergana Valley. This process was fundamental for agriculture, ensuring food security and economic stability in the region.

During the Soviet period, large-scale irrigation systems were built in Uzbekistan for the management of water resources and the development of agriculture. Agriculture was recognized as a primary sector, and significant irrigation infrastructure was created to maximize the efficient use of water. Irrigated land areas significantly expanded, contrasting with the traditional irrigation systems of previous centuries, and were based on modern technologies.

In the Soviet era, several large water reservoirs and new canals were constructed. This infrastructure was crucial for increasing agricultural productivity, controlling and distributing water resources. The construction of large water reservoirs and canals, such as those utilizing the Norin and Qoradaryo rivers in the Fergana Valley, positively impacted agriculture. The development of large water reservoirs and canals significantly boosted cotton cultivation and other crops.

During the Soviet period, not only was water management modernized, but sanitation systems also saw significant improvements. Drinking water supply in cities and villages was enhanced, and waste management and water purification systems were developed. This positively affected public health and living conditions. Modern sanitation technologies helped prevent diseases and improved overall sanitation conditions.

After gaining independence, Uzbekistan implemented comprehensive reforms in water management and sanitation. The modernization of old systems and the introduction of modern technologies were prioritized. To improve irrigation efficiency, water-saving technologies, such as drip irrigation and laser land leveling, were widely adopted. These changes helped increase productivity in agriculture and ensure the efficient use of water resources.

Since independence, Uzbekistan has collaborated with several international organizations in the field of water management and sanitation. Projects supported by the World Bank, the Asian Development Bank, and other international financial institutions have been implemented. These projects aimed to apply advanced practices

in water resource management, introduce water-saving technologies, and ensure environmental safety. Regional cooperation with Central Asian countries has also been developed to address regional issues related to water resources.

During the years of independence, Uzbekistan has undertaken several initiatives to effectively use water resources. New regulations for water conservation and rational use of groundwater have been adopted. Modern water supply networks and waste treatment facilities have been established to improve access to clean drinking water. Various initiatives are also supported to address water scarcity in rural areas.

In the modern era, Uzbekistan places significant emphasis on the rational use of water resources. Water-saving technologies, such as drip irrigation, rain-fed irrigation, and laser land leveling, are widely implemented. These technologies help reduce water wastage in irrigation systems and ensure effective use of water resources. Additionally, measures are being taken to develop renewable water sources, utilize groundwater, and optimize the use of water reservoirs.

Providing clean drinking water to rural populations and modernizing sanitation systems are critical issues. Several major projects are underway to provide rural populations with clean drinking water by establishing new water pipelines and water treatment facilities. Efforts are also focused on improving sanitation systems, managing waste, and modernizing water purification facilities, which contribute to better public health and overall sanitation conditions.

Conclusion

In conclusion, there are still many issues to be addressed in Uzbekistan's water management and sanitation sector. The limited water resources, insufficient clean water supply, and outdated sanitation systems are the primary challenges. To address these issues, it is necessary to widely implement water-saving technologies, improve clean water supply in rural areas, and modernize sanitation systems.

Future priorities should include enhancing water resource management strategies, establishing new purification systems, and strengthening environmental monitoring. Expanding international cooperation and applying global best practices can help achieve significant progress in addressing regional issues. Through these efforts, Uzbekistan can achieve sustainable development in the field of water management and sanitation.

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