ISNN 3030-3907

2026/2
VOLUME 4

DEVELOPMENT OF SCIENCE

ILMIY JURNAL



Development of science

Ilmiy jurnal

2026/2 VOLUME 4

ISSN 3030 -3907

Ilmiy jurnal OAK rayosatining 2024 yil 27 sentabrdagi 361-son qaroriga asosan 02.00.00 kimyo fanlari hamda 2025 yil 12 fevral 367- son qaroriga asosan 05.00.00 texnika fanlari bo‘yicha falsafa doktori (PhD) va fan doktori (DSc) ilmiy darajasiga talabgorlarning dissertatsiya ishlari yuzasidan dissertatsiyalari asosiy ilmiy natijalarini chop etish tavsiya etilgan milliy ilmiy nashrlar ro‘yxatiga kiritilgan.

BOSH MUHARRIR:
Temirov Alisher Hoshim o‘g‘li – texnika fanlari falsafa doktori (PhD),Dotsent.
TAHRIRIYAT KENGASH RAISI:
Fozilov Sadriddin Fayzullayevich – texnika fanlari doktori, professor
TAHRIRIYAT KENGASH A’ZOLARI

TEXNIKA FANLARI/ TECHNICAL SCIENCES/ ТЕХНИЧЕСКИЕ НАУКИ

Bozorov G‘ayrat Rashidovich
Buxoro Davlat Texnika Universiteti, professor
Abdurahmonov Olim Rustamovich
Buxoro Davlat Texnika Universiteti, professor
Adizov Bobur Zamirovich
O‘zbekiston Respublikasi Fanlar akademiyasi Umumiy va noorganik kimyo instituti, professor
Hayitov Ruslan Rustamjonovich
Buxoro Davlat Texnika Universiteti, professor
Jumayev Qayum Karimovich
Buxoro Davlat Texnika Universiteti, professor.
Berdiyev Dorob Murodovich
Islom Karimov nomidagi Toshkent Davlat Texnika Universiteti, professor
Maxmudov Rafiq Amonovich
Buxoro Davlat Texnika Universiteti, professor.
Tilloyev Lochin Ismatilloyevich
Buxoro Davlat Texnika Universiteti, dotsent.
Raxmonov Qahramon Sanakulovich
Buxoro Davlat Texnika Universiteti, dotsent.
Barakayev Nusratullo Rajabovich
Islom Karimov nomidagi Toshkent Davlat Texnika Universiteti, professor.
Jo‘rayev Xayrullo Fayziyevich
Buxoro Davlat Texnika Universiteti, professor.
Panoyev Erali Rajabboyevich
Buxoro Davlat Texnika Universiteti, dotsent.
Ataullayev Sherzod Nabiullyevich
Buxoro Davlat Texnika Universiteti, dotsent.
Murodov Malik Negmurodovich
Buxoro Davlat Texnika Universiteti, dotsent.
Axmedova Ozoda Bahronovna
Islom Karimov nomidagi Toshkent Davlat Texnika Universiteti.
Safarov Bahri Jumayevich
Buxoro Davlat Texnika Universiteti, dotsent.
Xaydarov Axtam Amonovich
Buxoro Davlat Texnika Universiteti, dotsent.
Safarov Jasur Alijon o‘g‘li
Buxoro Davlat Texnika Universiteti, dotsent.
Асадова Раъно Дилмуратовна
Тошкент Давлат техника университети доценти

KIMYO FANLARI/ CHEMICAL SCIENCES/ ХИМИЧЕСКИЕ НАУКИ

Axmedov Voxid Nizomovich
Buxoro Davlat Texnika Universiteti, professor
Umarov Baqo Bafoyevich
Buxoro Davlat Universiteti, professor
Kodirov Abduaxad Abduraximovich
Qarshi davlat Universiteti, professor
Qurbonov Mingniqul Jumagulovich
Qarshi davlat Universiteti, dotsent
Turemuratov Sharibay Naurizbaevich
O‘zbekiston Respublikasi Fanlar akademiyasi Qoraqalpog‘iston bo‘limi Bosh ilmiy kotibi, professor
Tursunov Kaxor Shonazarovich
Qarshi davlat Universiteti, professor
Do‘stov Hamro
Buxoro Davlat Texnika Universiteti, professor
Panoyev Nodir Shavkatovich
Buxoro Davlat Texnika Universiteti, dotsent.
Olimov Bobur Bahodir o‘g‘li
Buxoro Davlat Texnika Universiteti, dotsent.
Kasimov Sherzod Abduazimovich
Termiz Davlat Universiteti, professor.
Aliqulov Rustam Valiyevich
Termiz Davlat Universiteti, professor
Tropov Xamza Tursunovich
Samarqand Davlat Universiteti, professor

IQTISODIYOT FANLARI/ ECONOMICS/ ЭКОНОМИЧЕСКИЕ НАУКИ

Nizamov Aslitdin Badreddinovich
Buxoro Davlat Texnika Universiteti, professor.
Boboyev Akmal Choriyevich
Buxoro Davlat Texnika Universiteti, professor.
Ergashxojayeva Shaxnoza Djasurovna
Toshkent davlat iqtisodiyot universiteti, professor
Saidaxmedova Nodira Ilxomovna
Toshkent davlat iqtisodiyot universiteti, professor
Muxsinov Bekzod Toxirovich
Buxoro Davlat Texnika Universiteti, dotsent.
Shakarov Qulmat Ashirovich
Renessans ta'lim universiteti,dotsent.
Jumaeva Zulfiya Qayumovna
Buxoro Davlat Texnika Universiteti, dotsent.
Norova Salomat Yusupovna
Buxoro Davlat Texnika Universiteti, dotsent.
Avezova Shaxnoza Maxmudjonovna
Buxoro Davlat Texnika Universiteti, dotsent.
Jalilov Jamshid G‘anijonovich
Toshkent davlat iqtisodiyot universiteti, dotsent
Xasanova Gulruh Djumanazarovna
Buxoro Davlat Texnika Universiteti, dotsent.

PEDAGOGIKA FANLARI/ PEDAGOGICAL SCIENCES / ПЕДАГОГИЧЕСКИЕ НАУКИ

Siddiqova Sadoqat G‘afforovna
Buxoro Davlat Texnika Universiteti, dotsent.
Zoyirov Erkin Xalilovich
Buxoro Davlat Texnika Universiteti, DSc, professor
Gaffarov Feruz Hasanovich
Puchon Universiteti, *professor*
Ruziyev Davron Yuldashevich
Buxoro Davlat Universiteti, professor
Muradova Firuza Rashidovna
Buxoro Davlat Texnika Universiteti, professor.
Yunusova Gulandon Samiyevna
Buxoro Davlat Texnika Universiteti, professor.
To‘xtayeva Zebo Sharifovna
Buxoro Davlat Texnika Universiteti, professor.
Navro‘zova Gulchixra Nigmatovna
Buxoro Davlat Texnika Universiteti, dotsent.
Uzoqova Laylo Polvonovna
Buxoro muhandislik – texnologiya instituti, dotsent.
To‘raqulova Marjona Qiyom qizi
Buxoro Davlat Texnika Universiteti, dotsent.
Muradova Zarina Rashidovna
Buxoro Davlat Texnika Universiteti, dotsent.
Murodov Sanjar Aslonovich
Buxoro Davlat Texnika Universiteti, dotsent.
Shodiyev Jahongir Jo‘raqulovich
Buxoro Davlat Texnika Universiteti, dotsent
Gaffarov Laziz Hasanovich
Buxoro muhandislik – texnologiya instituti, dotsent.

Tahririyat a’zolarning to‘liq ro‘yxati jurnalning www.devos.uz saytida keltirilgan.

Tahririyat hay’ati a’zolarining tarkibini o‘zgartirish hamda qo‘shimcha kiritish yoki tahririyat a’zoligidan chiqarish bosh muharrir tomonidan amalga oshiriladi.

ISSN 3030-3907

Development of science ilmiy jurnali 2024 yil 15 aprel kuni №256445 sonli guvohnoma bilan Davlat ro‘yxatidan o‘tgan.

To‘plam elektron ko‘rinishda (pdf formatida) mualliflarga taqdim etiladi. To‘plamga kiritiladigan maqolalarning mazmuni, ulardagi statistik ma’lumotlar va me’yoriy hujjatlarning to‘g‘riligiga hamda har qanday fikr - mulohazalarga mualliflarning o‘zlari mas’ul hisoblanadilar. Talablarga javob bermaydigan maqolalar to‘plamga kiritilmaydi. Tashkiliy qo‘mita maqola matnini qisqartirish, qisman tuzatish kiritish, seksiyalarga joylashtirish huquqiga ega.

ISSN 3030-3907

MAIN DIRECTIONS OF IMPROVING THE WATER RESOURCES MANAGEMENT SYSTEM IN UZBEKISTAN

Ashurova Oltinoy Yuldashevna

Senior Lecturer, Department of Investment and Innovation, Samarkand Institute of Economics and Service

Annotation. Water resource management in Uzbekistan is critical, as the nation faces pressing environmental challenges due to its unique geographical and climatic conditions. The historical over-extraction of water, particularly from the Aral Sea basin, has exacerbated water scarcity and ecological degradation, impacting agriculture and rural livelihoods. This essay will explore key strategies for enhancing water resource management, focusing on sustainable practices, effective policy frameworks, and community engagement. Central to this discussion is the need for a diversified approach that incorporates both traditional methods and technological advancements, as depicted in , which illustrates the clash between traditional farming practices and modern economic pressures. Understanding the socioeconomic context of water resource management in Uzbekistan will enable more effective implementation of solutions, ensuring the preservation of precious water resources for future generations while fostering sustainable development within the region.

Keywords: Water-saving irrigation, Irrigation modernization, Digital water management, Transboundary cooperation, Integrated resource planning, Energy-efficient pumping, Sector digitization reforms.

Annotasiya. O'zbekistonda suv resurslarini boshqarish juda muhim, chunki mamlakat o'ziga xos geografik va iqlim sharoiti tufayli dolzarb ekologik muammolarga duch kelmoqda. Tarixiy suvning, xususan, Orol dengizi havzasidan ortiqcha qazib olinishi suv tanqisligini va ekologik degradatsiyani kuchaytirib, qishloq xo'jaligi va qishloqlarning turmush tarziga ta'sir ko'rsatdi. Ushbu insho suv resurslarini boshqarishni takomillashtirishning asosiy strategiyalarini o'rganadi, barqaror amaliyotlarga, samarali siyosat asoslariga va jamoatchilik ishtirokiga e'tibor qaratadi. Ushbu munozaraning markazida an'anaviy dehqonchilik amaliyoti va zamonaviy iqtisodiy bosim o'rtasidagi qarama-qarshilikni ko'rsatadigan an'anaviy usullar va texnologik yutuqlarni o'zida mujassam etgan diversifikatsiyalangan yondashuv zarur. O‘zbekistonda suv resurslarini boshqarishning ijtimoiy-iqtisodiy kontekstini tushunish yechimlarni yanada samaraliroq amalga oshirish, kelajak avlodlar uchun qimmatbaho suv resurslarini saqlashni ta’minlash hamda mintaqada barqaror rivojlanishni ta’minlash imkonini beradi.

ISSN 3030-3907

Kalit so'zlar: Suvni tejaydigan sug'orish, Irrigatsiyani modernizatsiya qilish, Raqamli suv boshqaruvi, Transchegaraviy hamkorlik, Resurslarni kompleks rejalashtirish, Energiya tejamkor nasoslar, Sektorni raqamlashtirish islohotlari.

Аннотация. Управление водными ресурсами в Узбекистане имеет решающее значение, поскольку страна сталкивается с неотложными экологическими проблемами из-за своих уникальных географических и климатических условий. Исторически чрезмерный забор воды, особенно из бассейна Аральского моря, усугубил дефицит воды и экологическую деградацию, что повлияло на сельское хозяйство и жизнь сельского населения. В этом эссе будут рассмотрены ключевые стратегии совершенствования управления водными ресурсами, с акцентом на устойчивые практики, эффективные политические рамки и взаимодействие с местным сообществом. В центре этого обсуждения находится необходимость диверсифицированного подхода, включающего как традиционные методы, так и технологические достижения, как показано на рисунке, иллюстрирующем столкновение традиционных методов ведения сельского хозяйства и современных экономических факторов. Понимание социально-экономического контекста управления водными ресурсами в Узбекистане позволит более эффективно внедрять решения, обеспечивая сохранение ценных водных ресурсов для будущих поколений и способствуя устойчивому развитию в регионе.

Ключевые слова: Водосберегающее орошение, Модернизация ирригации, Цифровое управление водными ресурсами, Трансграничное сотрудничество, Комплексное планирование ресурсов, Энергоэффективная перекачка воды, Реформы в области цифровизации сектора.

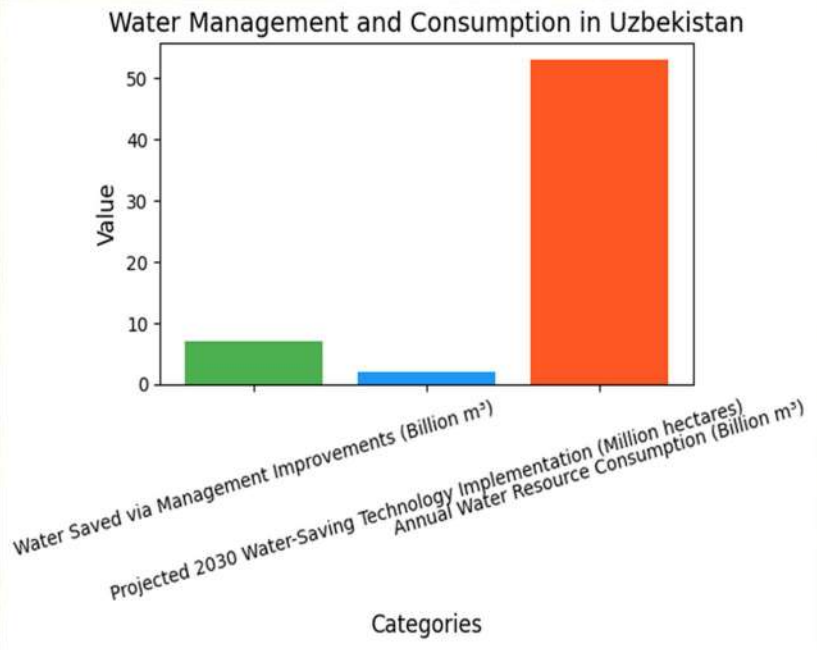
I. INTRODUCTION

Uzbekistans water resources are pivotal yet precariously managed, chiefly relying on two major rivers: the Amu Darya and the Syr Darya. These rivers have historically supported agriculture and livelihoods across the region but are currently facing severe challenges due to unsustainable water management practices and increasing demand from agriculture and industry. With approximately 90% of water usage allocated for irrigation, the inefficiencies in water distribution exacerbate the impending crisis, leading to significant environmental degradation and the alarming shrinkage of the Aral Sea. This situation is compounded by climatic variability, which alters precipitation patterns and intensifies drought conditions. The need for integrated water resource management strategies has become evident, as highlighted by the pressing impacts of these challenges on both the environment and socioeconomic factors in

ISSN 3030-3907

Uzbekistan. Addressing these issues through comprehensive reforms is crucial for sustainable development in the nation.

Effective water resource management is critical for sustainable development, particularly in water-scarce regions like Uzbekistan. The integration of advanced management practices is essential to not only alleviate current water shortages but also to mitigate potential environmental impacts stemming from agricultural practices. For instance, sustainable agricultural practices can substantially reduce pesticide runoff into freshwater systems, thereby improving water quality and supporting biodiversity, as highlighted in (Gabriel Pérez-Lucas et al., 2025) . Furthermore, adopting a framework that emphasizes the virtual water trade could enhance water use efficiency, allowing Uzbekistan to address local water scarcity issues without exacerbating dependencies on external water sources, as discussed in (Ashok K Chapagain, 2026) . Ultimately, improving water resource management aligns with global sustainability goals and enables more efficient use of available resources, framing water management as a core component of regional development strategies, as seen in (Azimov R, 2025) .



This bar chart illustrates the relationship between water management improvements, technology implementation, and annual water consumption in Uzbekistan. It highlights that 7 billion cubic meters of water can be saved through better management practices, while 2 million hectares are planned for water-saving technologies. In contrast, the annual water consumption reaches 53 billion cubic meters, showcasing the challenges posed by climate change and population growth.

II. MODERNIZATION OF IRRIGATION INFRASTRUCTURE

The modernization of irrigation infrastructure in Uzbekistan is essential not only for supporting agricultural productivity but also for promoting sustainable

ISSN 3030-3907

water resource management. Enhanced irrigation techniques, such as the installation of efficient water delivery systems, can significantly reduce water wastage and improve crop yields, addressing the pressing challenge of water scarcity exacerbated by climate change. For instance, similar successful initiatives in other regions, such as Moroccos shift to drip irrigation, underscore the potential benefits of such modernization efforts to conserve water resources and enhance agricultural resilience (Afaf B et al., 2025) . Furthermore, the implementation of innovative technologies, as seen in programs involving solar-powered irrigation systems, could offer sustainable solutions to counteract the impact of upstream water projects that threaten the Amu Darya Rivers flow (Shukurov E et al., 2025) . To visualize the urgency and benefits of these interventions, the impacts of water-smart agricultural practices highlighted in the image of water-smart agriculture emphasize the need for such modernization efforts in Uzbekistan.

In Uzbekistan, the imperative to upgrade outdated irrigation systems is pivotal for reducing water loss and enhancing agricultural productivity. Modern irrigation technologies, such as drip and sprinkler systems, have demonstrated significant water-saving capabilities, while traditional methods often lead to substantial inefficiencies and wastage (B Matyakubov et al., 2025) . By integrating these advanced techniques, farmers can maintain optimal soil moisture, crucial for increasing yields, particularly in water-intensive crops like cotton (A Adamov et al., 2025) . Furthermore, the adaptation of renewable energy solutions for irrigation, such as solar-powered systems, could mitigate the rising energy demands exacerbated by current practices (Shukurov E et al., 2025) . Recognizing the multifaceted challenges posed by climate change and upstream infrastructure developments, the focus must shift to sustainable practices that merge traditional knowledge with cutting-edge innovations, thus fostering a resilient water resource management system (Gupta H, 2025) . The effective transition towards these technologies is illustrated in , which emphasizes the benefits of precision irrigation in promoting water-smart agriculture.

III. IMPLEMENTING ADVANCED TECHNOLOGIES FOR EFFICIENT WATER DELIVERY

The integration of advanced technologies into Uzbekistans water delivery systems is essential for enhancing the efficiency of water management amidst the challenges posed by climate change and increased agricultural demands. By adopting innovative methods such as precision irrigation and automated monitoring systems, the country can significantly optimize water usage and reduce wastage. For example, the potential adoption of soilless cultivation techniques in agriculture could enhance water efficiency by up to 90%, which is critical in arid regions

ISSN 3030-3907

(Campana E et al., 2025). Furthermore, the development of smart infrastructure that integrates renewable energy sources can create sustainable solutions, enabling a reduction in costs associated with water management while simultaneously addressing environmental concerns (Masyhur RT et al., 2025) . These technological frameworks not only promise economic benefits but are also integral in fostering a sustainable and efficient agricultural sector (Azimov R, 2025). Overall, the strategic implementation of such technologies is vital for Uzbekistans long-term water resource management strategy (Hanjra AR et al., 2025).

In the context of Uzbekistans water resource management, the alignment of policy and regulatory reforms is crucial to address existing challenges and enhance sustainability. Effective reforms must integrate innovative practices, such as those outlined in the Strategy for Transition to a Green Economy (2019-2030), which emphasizes responsible resource management and ecological preservation (Galimova F et al., 2025) . Furthermore, international collaborations focused on ecological cooperation have positioned Uzbekistan as a regional leader in implementing comprehensive governance frameworks, thereby facilitating cooperative water management strategies with neighboring countries (T Ozodbekovich, 2025) . These efforts are vital for improving the resilience of water systems and mitigating the impact of climate change on water resources. The advancements in technology for water management, illustrated in reports like Water Technology Trends 2025, highlight the necessity for Uzbekistan to adopt smart water management solutions that are responsive to environmental demands and economically viable.

IV. DEVELOPING COMPREHENSIVE WATER MANAGEMENT POLICIES AND LEGAL FRAMEWORKS

The establishment of comprehensive water management policies and legal frameworks is essential for addressing the multifaceted water challenges faced by Uzbekistan. These frameworks must integrate sustainable practices that consider local ecological and socio-economic contexts while also accommodating international water-sharing agreements, as highlighted by the importance of virtual water trade in managing regional water scarcity (Ashok K Chapagain, 2026) . Moreover, the interdependence of water management, regional stability, and geopolitical dynamics, particularly in the context of Central Asias hydro-political landscape, necessitates collaborative legal frameworks that can withstand climatic and political pressures (Sarwar G et al., 2025) . Additionally, the adoption of green economy principles in policy-making can advance sustainable development by offering innovative financing mechanisms and promoting water conservation initiatives, thus aligning with broader environmental goals (Davlatova G, 2025) .

ISSN 3030-3907

Ultimately, these efforts will bolster Uzbekistans capacity for effective water resource management, enabling resilience against ongoing challenges such as climate change and regional water disputes while fostering transboundary cooperation (Ozodbekovich TQ, 2025) . The representation in serves to visually emphasize the critical need for these adaptive strategies in an era of fluctuating water availability.

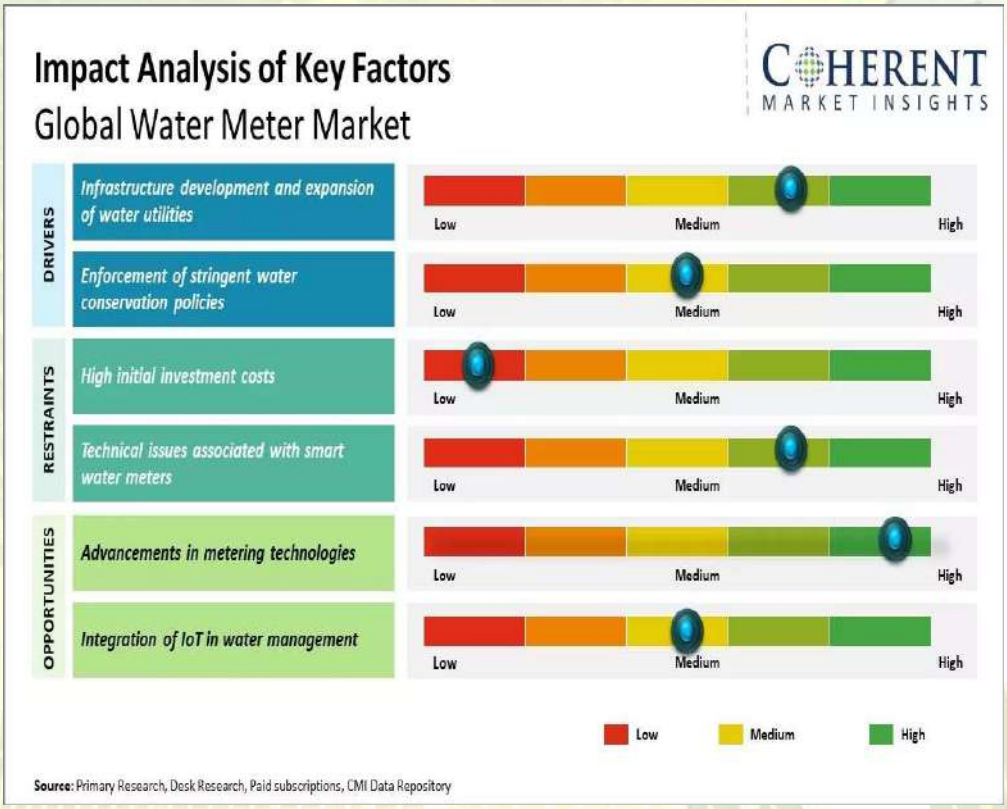


Image1: Impact Analysis of Key Factors in the Global Water Meter Market

Strengthening institutional coordination and governance mechanisms is paramount for the effective management of water resources in Uzbekistan. A comprehensive approach necessitates the alignment of national policies with international legal frameworks to facilitate collaborative water governance among Central Asian states. Enhanced diplomatic engagement is crucial, as evidenced by Uzbekistans proactive foreign policy initiatives aimed at fostering regional stability and cooperation on shared water issues (T Ozodbekovich, 2025) . The pressing challenges resulting from climate change and political tensions underscore the need for a paradigm shift in governance practices (Márton Krasznai et al., 2025) . Innovative frameworks that incorporate stakeholder participation can address these challenges, bridging gaps between domestic politics and regional water diplomacy. Furthermore, developing integrated water management systems that combine advanced technologies and traditional practices will optimize resource allocation and sustainability, as highlighted in the recent advancements in environmental strategies (Rizaldy et al., 2025) . The visual representation of these interconnected

ISSN 3030-3907

elements, such as in , further elucidates this complex relationship and its implications for Uzbekistan's water resource management system.

Promoting water conservation and fostering public awareness are critical components of enhancing the water resources management system in Uzbekistan. As water scarcity becomes increasingly problematic due to climate change and growing anthropogenic demands, a broad-based public engagement strategy is essential for sustainable water use. Initiatives that incorporate educational campaigns can significantly alter community attitudes toward water consumption practices, as highlighted in recent studies emphasizing participatory governance models in water resource management (Takhumova O et al., 2025) . Furthermore, community-driven efforts, such as participatory water monitoring, can enhance local investment in sustainable practices while addressing ecological and socio-economic challenges (Purevjav B et al., 2025) . Moreover, visual tools, such as the image highlighting water-smart agriculture, can effectively communicate the benefits of efficient irrigation and conservation methods, thereby illustrating the direct connection between personal actions and broader environmental impacts . Ultimately, strategic public awareness campaigns not only inform individuals but also empower communities to engage actively in protecting and conserving vital water resources.

Encouraging water-saving practices among agricultural and urban users is critical for sustaining Uzbekistans water resources amid growing demands. Implementing strategies that promote efficient irrigation techniques, such as drip irrigation or rainwater harvesting, is essential to reduce water waste in agriculture, which is responsible for a significant portion of the countrys water consumption. Urban areas, too, can benefit from adopting smart water management technologies that align with sustainable market trends, as reflected in studies showing that every dollar spent on adaptation can yield considerable returns (Brandon C et al., 2025) . Additionally, fostering public awareness about the necessity of conservation can galvanize community support, as highlighted by the potential for circular economy solutions that repurpose wastewater (Taron A et al., 2025) . The integration of these practices, combined with policy incentives, will not only improve water management but also enhance the socioeconomic stability of both rural and urban communities .

Increasing public education and stakeholder engagement in water management is imperative for the sustainable development of Uzbekistans water resources. Educating the public about the significance of water conservation and the impacts of climate change fosters a collective sense of responsibility, which is essential for community resilience. Evidence suggests that empowering local

ISSN 3030-3907

communities, particularly women, enhances adaptive behaviors in water usage and management, as they often play crucial roles in agriculture and household welfare (Pundir S et al., 2025) . Moreover, integrating innovative strategies like digital portfolios for knowledge dissemination can democratize access to vital information, making it more interactive and relevant to diverse audiences (Lee YL-Johnson et al., 2025) . Ultimately, a more engaged stakeholder base reinforces effective policy implementation and drives the adoption of sustainable practices, making good use of local knowledge and enhancing overall water management strategies in Uzbekistan (Talukder MB, 2025) (Patrícia Muniz dos Silva S et al., 2025) . The multifaceted interaction between community involvement and education exemplifies the progressive shift needed in Uzbekistan's water management paradigm, as illustrated in the impactful visualization of stakeholder dynamics and ecological trends.

V. CONCLUSION

In conclusion, the pressing challenges of water resource management in Uzbekistan require a multifaceted approach that aligns sustainable practices with effective governance. By implementing integrated water management strategies, Uzbekistan can mitigate the extensive environmental and economic impacts of water scarcity while enhancing its resilience to climate change. The application of advanced technologies, as depicted in , along with collaborative governance frameworks, is vital in facilitating equitable access to water resources. Further, adopting principles of international virtual water trade can optimize domestic water use, addressing critical shortages without exacerbating dependencies on external sources, as highlighted in (Ashok K Chapagain, 2026). Consequently, fostering community involvement and gender-sensitive policies, reminiscent of approaches seen in rural programs, will empower local populations to adapt sustainably, ensuring long-term ecological health and economic stability, a necessity emphasized by the findings in (Pundir S et al., 2025) and (Azimov R, 2025). Such comprehensive strategies will ultimately support Uzbekistans goal of sustainable development amidst imminent water crises.

REFERENCES

1. T. Ozodbekovich (2025). Uzbekistan's initiatives to ensure peace and stability in Central Asia, raising relations of friendship and cooperation with neighboring states to a new level. https://www.semanticscholar.org/paper/fae6c5a15b6204b06ce7f5272ce7ef622325a9ae

2. Firyuza Galimova, Nilufar Dekhkanova, Rufina Biktimirova (2025). Involvement of the Government in Supporting Bioeconomy Policy in Uzbekistan

ISSN 3030-3907

From An Institutional and Legal Perspective. https://www.semanticscholar.org/paper/ce2805cff297a12c9c9e7641d0c458ede3ed04ee

3. Sonaev Sanjar Nurmamatovich (2025). Economic Analysis of The Current State of The Oil and Gas Industry Enterprises of Uzbekistan. https://www.semanticscholar.org/paper/bbf5b066a1908b47db892040a7f852cf0a18440a

4. T. Shermukhamedov, M. A. Abdullayev, B. Holboev (2025). Environmental Problems in Uzbekistan and Ways to Solve Them. https://ajtmr.com/papers/Vol14Issue2/Vol14Issue2P4.pdf

5. Adamov, Kh. Kusainov, R. Yesbergen (2025). Water supply in agricultural sector of Kazakhstan: focus on optimization. https://www.semanticscholar.org/paper/4f4a252ed76db299a4c1e88e6886ca10ca785aae

6. Hrideshwer Gupta (2025). Comparative Analysis of Traditional and Modern Irrigation Practices for Enhancing Agricultural Sustainability. https://www.semanticscholar.org/paper/afb427516cd98309565c844d2d3a0dfdfac88cdf

7. Elyor Shukurov, Taiwo Bamgboye, Matin Rafipour Langeroudi (2025). Water-Energy-Food Challenges in Central Asia: A Comparative Study of Solar and Fossil Fuel-Powered Irrigation Systems . https://doi.org/10.5194/egusphere-egu25-1109

8. Matyakubov, O. Yakhyoev, A. Karabayev, A. Altmishev (2025). The importance of field research in efficient water use in Kashkadarya region. https://www.semanticscholar.org/paper/ca182045ef9f970971a20a9bc9b966970d43b344

9. Ferdinand Indammog (2025). Implementation of Free Irrigation Service Act at Upper Chico Irrigation System (UCRIs): Basis for Sustainability Plan. https://www.semanticscholar.org/paper/37b44f4c5f4c713b9f96fa5687aacd31caf54218

10. Belabhir Afaf, Sedki Azeddine (2025). Modernization of Irrigation Systems in Morocco: The Cooperative Conversion of Surface to Drip Irrigation. https://www.semanticscholar.org/paper/5ee6fb63e2a2d43ae627e62f593e2280d494c817

11. Oksana Minina, Nataliia Shadura-Nykyporets, Olga Shevchenko (2025). Water resources economics: management and efficient use in the context of climate change.

ISSN 3030-3907

https://www.semanticscholar.org/paper/8e71ad9807618d7a5cd96b9016978b72ed55926f
12. Oksana Takhumova, Maria Goncharova (2025). Innovative approaches to water resource management in achieving sustainable development goals. https://www.semanticscholar.org/paper/d79f141f6c1f944241c3c3fec04fcc483bd1c248
13. Bolormaa Purevjav, Bern Klein, Julian Dierkes, Nadja Kunz, André Xavier, Suzette McFaul (2025). Enhancing water sustainability in the Gobi Desert: processes based on IWRM principles. https://www.semanticscholar.org/paper/9cf5e5cc287d940c88544aa7ce49692db96e4d35
14. Impact Analysis of Key Factors in the Global Water Meter Market [Image]. (2026). Retrieved from https://www.coherentmarketinsights.com/images/research-%20methodology/water-meter-market-key-factors.png
15. Water-Smart Agriculture: Precision Irrigation Strategies [Image]. (2026). Retrieved from https://www.thefuturelist.com/wp-content/uploads/2024/02/Water-Smart-Agriculture-Precision-Irrigation-Strategies-1.png
16. Water Technology Trends 2025: An Overview of Digital Advancements in Water Management [Image]. (2026). Retrieved from https://www.xylem.com/el-gr/resources/white-papers/xylem-vue-water-technology-trends-2025/contentassets/trends-2025_en.png
17. Visual representation of urban water adaptation strategies. [Image]. (2026). Retrieved from https://ipcc.ch/report/ar6/wg2/downloads/figures/IPCC_AR6_WGII_Figure_4_021.png
18. Visual representation of global water scarcity and economic disparity. [Image]. (2026). Retrieved from https://images.zapnito.com/users/724980/posters/d02f0c8f-fcf9-464a-86db-3d1e43c039f5_large.png

ISSN 3030-3907