UN environment programme

CTCN UN Climate Technology Centre & Network

CTCN Technical Assistance
Request Submission Form

Guidelines:

- This Request Submission Form should be completed by the organisation requesting technical assistance from the Climate Technology Centre & Network (CTCN) in collaboration with the National Designated Entity (NDE) of the country in question
- The Form must be signed by the NDE. Please see updated contact list of NDEs here: http://unfccc.int/ttclear/support/national-designated-entity.html
- The Form can be submitted as a Word file containing a digital signature or as a signed and scanned PDF file in combination with an un-signed Word file
- For requests submitted by multiple countries, all the NDEs of the respective countries shall sign identical Forms before official submission to the CTCN
- NDEs have the opportunity to submit CTCN requests in collaboration with National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

Requesting country or countries:	Uzbekistan
Request title:	Preliminary Feasibility Study for Groundwater Desalination and Resource Recovery in Uzbekistan
NDE	**The Agency of Hydrometeorological service** (Uzhydromet) **Mr. Khabibullayev Sherzod Khabibullakhujayevich** / Director of the Uzhydromet Email: uzhymet@meteo.uz (address) 72, 1 st Bodomzor yuli str., Tashkent, 100052, Uzbekistan
Request Applicant:	**State Establishment "Institute of Hydrogeology and Engineering Geology"** (HYDROENGEO) **Dr. Bimurzaev Gany Amirgalievich /** Director of the HYDROENGEO Email: gany82@mail.ru Address of the organization: 64, Olimlar str., Mirzo-Ulugbek district, Tashkent, Uzbekistan, 100071

Climate objective:

☐ Adaptation to climate change
☐ Mitigation of climate change
☒ Combination of adaptation and mitigation of climate change

Geographical scope:

☐ Community level
☐ Sub-national
☒ National

☐ Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas (provinces, states, countries, regions, etc.).

Problem statement related to climate change (up to one page):

Uzbekistan is facing a significant challenge with water scarcity, which is exacerbated by its semi-arid climate, low precipitation, and a heavy reliance on shared international rivers. The country's water resources are under pressure due to extensive agricultural use and inefficient water management practices, which lead to high water loss through outdated irrigation systems. Additionally, soil salinization, driven by the use of saline groundwater, is threatening agricultural productivity. As climate change continues to impact water availability and intensify aridity, Uzbekistan's water resources and agricultural sectors are increasingly vulnerable. The expanding use of groundwater to meet rising water demands has been hampered by high mineral content, making a considerable portion of groundwater unusable without treatment.

Moreover, Uzbekistan's unique geological conditions present opportunities for the extraction of rare metals from groundwater. However, extracting these resources without appropriate technology risks worsening environmental issues, including water pollution and land degradation. Addressing these challenges through water treatment and resource recovery technologies will be essential for Uzbekistan to secure water resources, recover valuable minerals, and ensure sustainable development in the face of climate change.

Past and on-going efforts to address the problem (up to half a page):

Uzbekistan has made significant strides in addressing its climate-related challenges through various national strategies and international collaborations. The country's National Sustainable Development Goals (SDGs), established in partnership with the UN and the World Bank, aim to achieve 125 targets by 2030, with a focus on areas like clean water, sustainable cities, and environmental sustainability. This aligns with the Uzbekistan 2030 strategy, introduced by President Shavkat Mirziyoyev, which emphasizes sustainable economic growth and efficient water resource management.

In the water sector, Uzbekistan has implemented a comprehensive development strategy for 2020-2030 to improve water use efficiency and address water scarcity. Legislative measures (such as DP №6024 dated 10.07.2020) have been enacted to modernize water infrastructure, integrate digital technologies, and attract foreign investments. Additionally, the 2020-2030 development concept prioritizes lowering soil salinity and improving water purification processes. To protect and optimize groundwater resources, the government has recently introduced measures to improve well-drilling systems, promote rational water use, and enhance groundwater conservation. (such as DP №439 dated 07.12.2022 and DP №74 dated 07.05.2024)

The "New Uzbekistan Development Strategy" (2022-2026) focuses on securing water resources, reducing environmental impacts, and transitioning to a green economy. This medium-term strategy includes reforms in water management, especially for groundwater, and promotes the recovery of rare metals, contributing to economic development and sustainability. Collectively, these initiatives demonstrate Uzbekistan's proactive approach to tackling its climate-related challenges, focusing on long-term resource conservation and economic resilience.

Specific technology[1] barriers (up to one page):

Despite Uzbekistan's proactive efforts to address water scarcity and environmental sustainability, significant technology barriers persist, especially in water treatment and resource recovery. These challenges hinder Uzbekistan's ability to fully realize its National SDGs and sustainable development strategies, particularly regarding efficient water management and mineral resource utilization.

○ **Lack of Advanced Water Treatment Technologies**: Uzbekistan faces difficulties in treating saline groundwater to produce potable water. Many existing facilities lack the modern technologies necessary for effective desalination, limiting the country's ability to ensure access to clean water. Outdated infrastructure and insufficient adoption of global best practices in water purification mean that a substantial portion of groundwater remains unsuitable for direct use. This limitation affects Uzbekistan's capacity to meet SDG 6 (Clean Water and Sanitation) and impedes efforts to secure long-term water resources for its population.

○ **Inadequate Resource Recovery Technologies**: Uzbekistan's unique geological conditions provide opportunities to extract valuable rare metals from groundwater. However, current technologies are insufficient for the efficient and sustainable extraction of these resources. The absence of effective resource recovery technologies not only prevents Uzbekistan from fully capitalizing on its mineral wealth but also contributes to environmental issues such as soil salinization and water pollution. These barriers constrain the country's sustainable economic growth and limit its ability to develop mineral resources in alignment with environmental goals.

CTCN technical assistance is essential for addressing these technological gaps by providing expertise and resources to assess, identify, and deploy advanced water treatment and resource recovery technologies. Through capacity-building, technology transfer, and access to global best practices, CTCN assistance will enable Uzbekistan to adopt cutting-edge desalination and mineral extraction technologies. This support will not only enhance Uzbekistan's water security and resource recovery efforts but also advance its sustainable development goals by promoting more efficient and environmentally sound water management practices.

Sectors:

Please indicate the main sectors related to the request:

☐ Coastal zones	☐ Early Warning and Environmental Assessment	☐ Human Health	☐ Infrastructure and Urban planning
☐ Marine and Fisheries	☒ Water	☒ Agriculture	☒ Carbon fixation
☐ Energy Efficiency	☐ Forestry	☒ Industry	☐ Renewable energy
☐ Transport	☐ Waste management		

[1] *"**any equipment, techniques, practical knowledge and skills** needed for reducing greenhouse gas emissions and adapting to climate change" (Special Report on Technology Transfer, IPCC, 2000)*

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

☐ Communication and awareness	☒ Economics and financial decision-making	☒ Governance and planning	☐ Community based
☐ Disaster risk reduction	☐ Ecosystems and biodiversity	☐ Gender	

Technical assistance requested (up to one page):

Overall Objective:

The main objective of the requested technical assistance is to support Uzbekistan in overcoming key technological barriers related to advanced water treatment and resource recovery. This assistance will enable Uzbekistan to enhance its climate adaptation efforts, specifically by preparing for pilot-scale processes that can treat saline groundwater and recover valuable minerals.

Anticipated Groups of Activities:

1. **Assessment and Feasibility Studies**: Conduct a comprehensive assessment of current water treatment and resource recovery technologies, focusing on identifying advanced desalination methods and resource recovery techniques suitable for Uzbekistan's context. This includes evaluating the feasibility and potential impacts of these technologies.
2. **Technology Transfer and Capacity Building**: Facilitate the transfer of knowledge and training to local stakeholders on advanced water treatment and mineral extraction technologies. Capacity-building activities will include workshops and training sessions to equip local professionals with the skills needed to design and operate these systems.
3. **Preparation for Pilot-Scale Process Design**: Based on the data collected during the technical assistance, support the development of pilot-scale process designs. This will involve determining the appropriate scale and design of pilot systems that could be implemented in future demonstration projects. The focus will be on using real-world data to tailor the processes to local conditions and needs.
4. **Stakeholder Engagement and Knowledge Sharing**: Involve relevant stakeholders, including government agencies, industry experts, and local communities, to share knowledge and promote sustainable practices. This engagement will ensure alignment with national goals and encourage stakeholder buy-in for future pilot and full-scale implementations.

Anticipated Products to be Delivered:

1. **Comprehensive Assessment Report**: A detailed report evaluating the feasibility and potential impacts of advanced desalination and resource recovery technologies for Uzbekistan.
2. **Capacity Building Materials**: Training manuals, workshop materials, and guidelines on designing and operating advanced water treatment and resource recovery systems.
3. **Pilot-Scale Process Design Documentation**: Preliminary designs and technical specifications for

pilot-scale water treatment and resource recovery systems, tailored to Uzbekistan's conditions, that can guide future demonstration projects.

4. **Stakeholder Engagement Framework**: A structured framework to facilitate ongoing stakeholder engagement and knowledge sharing, supporting the broader adoption of these technologies.

This technical assistance will equip Uzbekistan with the foundational knowledge and designs needed to proceed with pilot-scale projects, advancing the country's capacity for climate adaptation and sustainable resource management.

Expected timeframe:

2025. 01 - 2025. 21 (12months)

Anticipated gender and other co-benefits from the technical assistance:

The groundwater desalination and resource recovery project in Uzbekistan is expected to yield significant gender and other co-benefits, as outlined below:

1. **Gender** **Benefits:**
   The project will include targeted efforts to ensure women's participation in the planning, implementation, and monitoring phases. By providing technical training and capacity-building opportunities specifically for women, the project aims to empower women in the fields of water management and environmental technology, where female representation is often limited. This approach aligns with Uzbekistan's national goals for gender equality and supports broader societal efforts to integrate women into technical and decision-making roles, particularly in rural areas where access to clean water directly impacts women's daily lives and responsibilities.
2. **Economic Co-benefits:**
   Implementing desalination and mineral recovery technologies can stimulate local economies by creating jobs and enhancing skills in sustainable technology sectors. Improved access to potable water will enhance public health and productivity, especially in underserved areas. Additionally, by ensuring a stable water supply, the project can bolster agricultural productivity, which is crucial for Uzbekistan's economy and local livelihoods, especially in water-scarce regions.
3. **Environmental and Biodiversity Co-benefits:**
   Focusing on resource recovery, the project aims to minimize environmental pollution by extracting valuable minerals from the concentrated brine produced during desalination. Furthermore, by improving access to clean water, the project will help mitigate soil salinization, a significant issue in Uzbekistan, thereby protecting and promoting biodiversity. Sustainable groundwater management contributes to the overall ecological balance, aligning with Uzbekistan's environmental priorities and commitments to biodiversity conservation.
4. **Social and Cultural Co-benefits:**
   Access to clean water is fundamental to enhancing quality of life and health outcomes. The project promotes social equity by providing access to safe water for communities that have historically faced water scarcity. Additionally, by respecting local knowledge and cultural practices regarding water use, the project can strengthen community cohesion and ensure that solutions are culturally appropriate.

This project, therefore, contributes to gender equality and brings wide-ranging social, economic, and environmental benefits to Uzbekistan, fostering sustainable development and resilience in the face of climate change.

Key stakeholders:

Please list the stakeholders who will be involved in the implementation of the requested CTCN technical assistance and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.).

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity (~~~~~)	The NDE serves as the primary liaison between Uzbekistan and the Climate Technology Centre and Network (CTCN). Its role involves coordinating the technical assistance process, ensuring that the project aligns with national climate goals and policies. The NDE is also responsible for facilitating communication among stakeholders, securing necessary approvals, and assisting in integrating the outcomes of the technical assistance into national strategies.
Request Applicant (HYDROENGEO)	HYDROENGEO, as the request applicant, is responsible for the on-ground execution of the technical assistance. This includes providing technical expertise, overseeing pilot project implementation, and managing local resources. HYDROENGEO will work closely with the NDE and other stakeholders to ensure the smooth operation of the project and to adapt technologies to local conditions. Additionally, HYDROENGEO will monitor and report on project progress, including the collection and analysis of data from pilot demonstrations.
Ministry of Water Resources	This ministry will support the technical assistance by providing regulatory guidance and sharing relevant data on water resources. It will help align the technical assistance with Uzbekistan's water management policies and provide insights into the feasibility and scalability of water treatment technologies in the national context.
Local Water Management Authorities	Local authorities will assist in implementing pilot projects by offering access to specific sites and supporting data collection. They will also facilitate community engagement and support in operating the technologies introduced during the pilot phase.
Environmental Protection Agency	This agency will oversee environmental assessments to ensure that the introduced technologies comply with national environmental regulations. They will also play a role in evaluating the environmental impact of resource recovery and water treatment technologies.
Local Communities and Farmers	Engaging local communities and farmers is crucial for project success, as they are directly impacted by water scarcity and soil salinization. They will participate in training sessions, provide feedback on technology effectiveness, and help promote sustainable practices in water use and resource recovery.

Alignment with national priorities (up to 2000 characters including spaces):

Reference document (please include date of document)	Extract (please include chapter, page number, etc.). 1. According to the approved Decree of the President of the Republic of Uzbekistan dated July 10, 2020 No. DP №6020 "Concept of Development of Water Management of the Republic of Uzbekistan for 2020-2030", the main goal for the republic is to create the conditions necessary to meet the ever-growing needs of the population, economic sectors and the environment for water, ensure reliable and safe operation of water management facilities, as well as effective management and rational use of water resources, improve the reclamation state of irrigated lands, achieve water security in the context of increasing water scarcity and global climate change (Chapters 3, 4 and 5 Appendix No. 1). 2. By the Decree of the President of the Republic of Uzbekistan dated 07.05.2024 DP №74 "On determining the priority areas for the implementation and development of a modern management system in water management" the priority areas for the implementation and development of a modern management system in water management were determined (paragraphs 1, 10 and 11). 3. In order to further improve the groundwater use system in the republic, strengthen state and public control over the protection of groundwater resources, widely promote the culture of rational water use among the population, prevent their quantitative decrease and pollution, as well as ultimately provide the population with high-quality drinking water in the long term, the Resolution of the President of the Republic of Uzbekistan dated December 7, 2022 No. DP №439 "On additional measures to protect and streamline the rational use of groundwater resources" was adopted (paragraphs 9 and 10, Appendix No. 3, Section I positions 1 and 2). 4. Resolution of the President of the Republic of Uzbekistan №4522 dated 18.11.2019 "On measures to improve the system of organizing and conducting geological exploration for oil and gas" Appendix No. p. 2. 11. (Introduction into practice of mandatory testing of formation groundwater when drilling wells for oil and gas to study their properties and assess the possibility of their use, taking into account the extraction of valuable components).
Nationally Determined Contribution (NDC)	Uzbekistan's NDC prioritizes reducing greenhouse gas emissions and increasing climate resilience, particularly in water resource management. This project supports these objectives by enhancing access to potable water through desalination and reducing the need for energy-intensive water importation. By incorporating renewable energy into the desalination process, the project also contributes to emission reduction targets.
Technology Needs Assessment	Uzbekistan has highlighted the need for advanced technologies in water treatment and resource recovery. This project introduces cutting-edge

	desalination and mineral recovery technologies from the Korean Consortium, addressing Uzbekistan's technological gaps and building local capacity for sustainable water management.
National Adaptation Plans	Climate adaptation in Uzbekistan places a strong emphasis on water security due to the increasing threat of water scarcity. This project directly addresses this priority by improving groundwater resources and ensuring reliable water supplies, thus enhancing Uzbekistan's resilience to climate change impacts.
Nationally Appropriate Mitigation Actions	The project's potential to use renewable energy sources aligns with Uzbekistan's NAMA goals for reducing dependency on fossil fuels and promoting sustainable energy use. By integrating renewable energy into the desalination process, the project mitigates carbon emissions, contributing to Uzbekistan's low-emission development pathway.
Add others here as relevant	

Development of the request (up to 2000 characters including spaces):

The groundwater desalination project in Uzbekistan began in January 2019 with a Memorandum of Understanding between the Korean Consortium (KITECH, ERG) and HYDROENGEO. From October 2020 to February 2022, these partners carried out a joint international research project on groundwater treatment and mineral resource recovery. Subsequent agreements involved potential ODA and additional international R&D collaboration.
The Korean Consortium (including Golden Engineering) regularly collaborates with the Ministry of Mining and Geology and institutions like HYDROENGEO and the University of Geological Sciences, organizing seminars and workshops on groundwater treatment technologies. In August 2022, a conference on resource development was held. In 2023, they explored mineral carbonation for resource extraction post-treatment.
During the Korean President's June 2024 visit, KITECH signed an MoU with the Tashkent Chemical-Technological Institute, and meetings with Uzbekistan's Ministry of Mining and Geology followed. The Uzbek government is keen on Korean technology and aims to continue collaborating on desalination and resource recovery.

Background documents and other information relevant for the request:

- Please list all relevant documents that will help the CTCN analyse the context of the request and national priorities. Please note that all documents listed/provided should be mentioned in this request in the relevant section(s), and that their linkages with the request should be clearly indicated. For each document, please provide web-links (if available) or attach to the submission form. Please add any other relevant information as required.
- Please indicate if this request has been developed with the support of the CTCN Request Incubator.

1. According to the Concept of Water Management Development in the Republic of Uzbekistan for 2020-2030 approved by the Decree of the President of the Republic of Uzbekistan dated 10.07.2020 DP №6020, the main goal for the republic is to create the conditions necessary to meet the ever-growing needs of the population, economic sectors and the environment for water, ensure reliable and safe operation of water management facilities, as well as effective management and rational use of water

resources, improve the reclamation state of irrigated lands, achieve water security in the context of increasing water scarcity and global climate change (Chapters 3, 4 and 5, Appendix No. 1).

2. The Decree of the President of the Republic of Uzbekistan dated 07.05.2024 No. DP №74 "On Determining Priority Areas for the Implementation and Development of a Modern Management System in Water Management" defines the priority areas for the implementation and development of a modern management system in water management (paragraphs 1, 10 and 11). 3. In order to further improve the groundwater use system in the republic, strengthen state and public control over the protection of groundwater resources, widely promote the culture of rational water use among the population, prevent their quantitative decrease and pollution, and ultimately provide the population with high-quality drinking water in the long term, the Resolution of the President of the Republic of Uzbekistan dated December 7, 2022 No. DP №439 "On additional measures to protect and streamline the rational use of groundwater resources" was adopted (paragraphs 9 and 10, Appendix No. 3, Section I, items 1 and 2). 4. Resolution of the President of the Republic of Uzbekistan No. 4522 dated November 18, 2019 "On measures to improve the system of organizing and conducting geological exploration for oil and gas" Appendix No. paragraph 2. 11. (Introduction of mandatory testing of formation groundwater when drilling wells for oil and gas to study their properties and assess the possibility of their use, taking into account the extraction of valuable components).

5. Resolution of the President of the Republic of Uzbekistan dated 24.06.2024 DP №233 "On measures to create an agroecosystem resilient to climate change and increase the resilience of agricultural producers to the risks associated with climate change"

6. Resolution of the President of the Republic of Uzbekistan dated 31.05.2023 DP №171 "On measures to effectively organize the activities of the Ministry of Ecology, Environmental Protection and Climate Change"

OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness and preparatory support delivered directly to countries through their GCF NDA. These actions are in line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 that addresses Linkages between the Technology and the Financial Mechanisms[2].

The CTCN is therefore implementing some of its technical assistance using GCF readiness funds accessed via the country's NDA. Any application for GCF support, including the amount of support provided, is subject to the terms and conditions of the GCF and should be developed in conjunction with the NDA.

Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

☐ Initial engagement: The GCF NDA of the requesting country has been engaged in the design of this request and the NDA will be involved in the further process leading to an official agreement for accessing GCF readiness support.

☐ Advanced engagement (preferred): The GCF NDA of the requesting country has been directly

[2] Please see:
https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

involved in the design of this request and is a co-signer of this request, the signature indicating provisional agreement to use readiness national funds to support the implementation of the technical assistance.

NDA name:

Date:

Signature:

Monitoring and impact of the assistance:

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.
I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

Signature:

NDE name: **The Agency of Hydrometeorological service / Mr. Khabibullayev Sherzod Khabibullakhujayevich**

Date: 05/11/2024

Signature:

THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG

The CTCN is available to answer all questions and provide guidance on the application process.