Monitoring & Evaluation (M&E) Plan and Impact Statement Form

Objective of the M&E Plan and Impact Statement:

- The M&E Plan and Impact Statement must be designed based on the Technical Assistance Response Plan and must enable the Implementer to complete the Closure Report at the end of the assistance.

Process for filling in the form:

- The Implementer must identify relevant quantitative and qualitative indicators as specified in the Closure Report. A sub-set of indicators to monitor and assess must be chosen among these.
- The Implementer may also identify other specific, measurable, achievable, relevant, and time-bound indicators suitable to monitor Activities, Outputs and anticipated Outcomes from the technical assistance and add to the M&E Plan and Impact Statement.
- During implementation of the TA or FTA, the Implementer must collect all relevant data as described in the Monitoring & Evaluation Plan. Aggregated data on selected indicators as well as an updated version of the Impact Statement will be presented in the Closure Report at the end of the assistance.

Basic Information	
Title of response plan	**Pre-feasibility study for groundwater desalination and resource recovery in Uzbekistan**
Technical assistance reference number	**2024000047**
Country/ countries	**Uzbekistan**
NDE focal point and organisation	Mr. Khabibullayev Sherzod Khabibullakhujayevich, Director, The Agency of Hydrometeorological Service (Uxbydromet)
Sector(s) addressed	**Water resources, Climate change adaptation, Resource recovery**
Technologies supported	Groundwater desalination technologies (including gas hydrate-based desalination), CO_2-utilizing technologies, Mineral carbonation-based resource recovery
Implementation period and total duration	**2025-11-07 ~ 2026-09-06 (10 months)**
Total budget for implementation	**USD 249,914**
Designer of the response plan	Korea Institute of Industrial Technology (KITECH)

Implementer of response plan	Korea Institute of Industrial Technology (KITECH)

(A) Outputs and Activities as described in the Response Plan	(B) Indicator	(C) Expected results	(D) Method and frequency for data collection	(F) Comments
Output 1: Review of applicable desalination and resource recovery technologies in Uzbekistan	• Number of technical review reports completed	• *One consolidated technical review report completed*	• *Desk review and documentation review*	*Availability of reliable baseline data may vary across regions*
Activity 1.1: Technology status and capacity assessment in Uzbekistan	• Number of technologies reviewed • Qualitative assessment of technical capacity	• Global desalination and resource recovery technologies reviewed	• Desk study and expert assessment	Rapid evolution of technologies may require updates
Activity 1.2: Local survey in Uzbekistan (Groundwater characteristics)	• Number of sites surveyed • Number of groundwater samples analyzed	• At least 3 candidate regions surveyed • Groundwater composition dataset established	• Field survey • Laboratory analysis results(Data collected once per site)	Site access and seasonal constraints may affect schedule
Activity 1.3: Desalination and resource recovery testing	• Number of simulated feedwater tests • Availability of performance data	• Simulated feedwater tests completed • Preliminary performance data obtained	• Laboratory test results • Compilation after test completion	Lab-scale results may differ from field performance
Activity 1.4: Assessment of local applicability based on test results	• Number of sites ranked • Final pilot site selected	• Candidate sites ranked • One priority pilot site selected	• Technology screening matrix • Steering Committee validation	Final decision subject to PSC agreement
Output 2: Design of pilot system for groundwater desalination and resource recovery	• Number of pilot system design reports completed	• One pilot system design report completed	• Engineering and technical design review based on available data and assumptions	This output focuses on pilot system design and does not constitute investment-grade engineering or a full feasibility study
Activity 2.1: System design review based on sample and test results		• Sample and test results reflected in the pilot system design assumptions	• Review of laboratory and test results for design refinement	Test results are based on limited samples and indicative conditions
Activity 2.2:		• Conceptual	• Conceptual process	Layout is conceptual

Conceptual design of process flow and site-specific layout		process flow diagram and preliminary site-specific layout developed	flow design and layout planning	and subject to site confirmation
Activity 2.3: Pilot scale optimization based on CAPEX and OPEX analysis		• Recommended pilot system scale identified based on indicative CAPEX and OPEX considerations	• Review of pilot scale through CAPEX and OPEX calculations	Cost analysis is indicative and for design optimization purposes only
Activity 2.4: Preparation of basic engineering documents for pilot construction		• Basic engineering documents prepared for pilot construction (e.g. PFD, layout drawings)	• Preparation of basic engineering documents (e.g. PFD, layout drawings)	Documents are prepared for pilot-level construction only
Output 3: Feasibility assessment of the pilot system and Scale-up project concept note	• Number of feasibility assessment and project concept notes completed	• One feasibility assessment report for the pilot system completed • One scale-up project concept note prepared	• Integrated technical, socioeconomic, and environmental evaluation based on available data and assumptions • Preparation of a project concept note based on assessment results	Feasibility assessment is conducted at a pre-investment level and does not constitute an investment-grade feasibility study
Activity 3.1: Technical evaluation		• Technical evaluation materials prepared for the pilot system	• Review of system design, performance assumptions, and technical requirements	Evaluation is based on pilot-level design assumptions
Activity 3.2: Socioeconomic evaluation (Including gender considerations)		• Socioeconomic evaluation materials prepared, including a gender analysis report	• Qualitative socioeconomic analysis based on stakeholder information and available data	Gender analysis is based on available data and qualitative assessment
Activity 3.3: Environmental evaluation		• Environmental evaluation materials prepared for the pilot system	• Qualitative environmental assessment considering potential impacts and risks	This assessment does not replace formal EIA requirements
Activity 3.4: Scale-up project concept		• Scale-up project concept note	• Synthesis of feasibility assessment	Concept note is intended for further

note		prepared with supporting documents, as applicable	results into a project concept note	project development and financing discussions
Output 4: Technical training and stakeholder exchange on groundwater treatment and resource recovery	• Number of training sessions, workshops, and stakeholder engagement events conducted	• Technical trainings and stakeholder exchange activities conducted • Final report and dissemination materials prepared	• Review of training records, materials, and dissemination documents	Activities focus on knowledge sharing and capacity building and do not constitute formal certification or accreditation
Activity 4.1: Steering committee formation and meetings (Twice)		• Steering committee established and meetings conducted • List of steering committee members and meeting minutes prepared	• Review of steering committee member list and meeting minutes	Steering committee meetings are conducted as part of project governance
Activity 4.2: Stakeholder training and technical workshops		• Stakeholder training sessions and technical workshops conducted • Training materials prepared, including introductory and practice-oriented materials based on pilot design	• Review of training agendas, participant lists, and training materials	Training content is adapted to local context and available information
Activity 4.3: Final report and result dissemination		• Final report and presentation materials prepared and disseminated to stakeholders	• Review of final report and presentation materials	Dissemination is intended for knowledge sharing and follow-up project development

Note: The Response Plan may contain information useful for the section below. The information in the table below will be used by the CTCN for public communication of the achieved and expected results of the Technical Assistance through the CTCN website www.ctc-n.org and other

communication channels. See for example: https://www.ctc-n.org/sites/www.ctc-n.org/files/benin_a_ag_forestry.final_.pdf

Impact Statement	
Challenge	Uzbekistan faces increasing pressure on groundwater resources due to climate variability, rising water demand, and limited availability of alternative water sources. In many regions, groundwater is saline or of insufficient quality for domestic, industrial, or agricultural use. At the same time, opportunities for resource recovery from concentrated brine and the utilization of CO_2 emissions remain largely unexplored, limiting climate-resilient and low-carbon water management options.
CTCN assistance	• Review of applicable groundwater desalination and resource recovery technologies under Uzbekistan conditions • Design of a pilot-scale system for groundwater desalination and resource recovery • Feasibility assessment of the pilot system, including technical, socioeconomic, environmental, and gender considerations • Development of a scale-up project concept note and capacity-building activities for national stakeholders
Anticipated impact	• Enhances climate resilience of water infrastructure by enabling climate-resilient groundwater desalination and resource recovery solutions in water-scarce and saline regions. • Improves water security for communities and productive sectors by diversifying water supply sources and reducing reliance on unsustainable groundwater extraction. • Supports low-carbon and circular resource management through pilot-scale application of CO_2-utilizing or gas-hydrate-based technologies and resource recovery from brine streams. • Strengthens institutional and technical capacity for climate technology deployment, laying the foundation for future scale-up and replication across Uzbekistan.
Anticipated co-benefits from the TA	The technical assistance is expected to generate multiple co-benefits beyond its core technical outcomes. Improved access to safe and reliable water is anticipated to enhance public health and reduce climate-induced water stress, particularly in underserved and remote areas. Environmentally, sustainable groundwater management and appropriate brine handling may help prevent ecosystem degradation

	and soil salinization. Economically, resource recovery from concentrate streams has the potential to support local value chains and create livelihood opportunities for both women and men. Institutionally, the TA is expected to strengthen capacities for inclusive and climate-resilient water management.
Gender aspects of the TA	Gender considerations are embedded in the design and implementation of this technical assistance. A gender analysis and Gender Action Plan (GAP) will guide activities to address gender disparities in water access, technical training, and decision-making processes. Gender-disaggregated data will be collected during stakeholder engagement and training activities. The TA adopts inclusive and gender-responsive approaches to promote the participation of women and marginalized groups, while supporting capacity building and opportunities for women to engage in climate-resilient water and resource recovery technologies.
Anticipated contribution to NDC	• Supports climate change adaptation by enhancing water security through groundwater desalination, addressing increasing water scarcity in line with Uzbekistan's NDC and national adaptation priorities. • Contributes to the deployment of low-emission, climate-resilient water technologies, including CO_2-utilizing or gas hydrate-based approaches, supporting the transition toward sustainable water infrastructure. • Promotes sustainable resource management through recovery of valuable resources from brine and concentrate streams, aligning with national circular economy objectives and SDGs. • Strengthens institutional and human capacity through technical training and stakeholder engagement, supporting technology transfer and implementation under national climate and innovation strategies.
The narrative story	This technical assistance responds to Uzbekistan's growing need for sustainable and climate-resilient groundwater management solutions. By combining technology review, pilot system design, feasibility assessment, and stakeholder capacity building, the TA establishes a structured pathway from technical understanding to project development. The assistance supports national institutions in exploring innovative approaches to groundwater desalination and resource recovery, while laying the foundation for future

	scale-up projects aligned with national climate and development priorities.
Contribution to SDGs	**SDG 6 – Clean Water and Sanitation** The project addresses water scarcity and salinity issues by introducing climate-resilient groundwater desalination technologies in underserved and highdemand regions. **SDG 12 – Ensure sustainable consumption and production patterns** By recovering valuable elements from brine concentrate and reducing waste discharge, the project promotes resource efficiency and circular economy principles in water treatment. **SDG 13 (Target 13.1) – - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries** The project contributes to climate adaptation by enhancing resilience to water stress and supporting the use of low-emission technologies.
Reference to knowledge products	Relevant UNFCCC Technology Executive Committee (TEC) knowledge products are envisaged to be used as general reference materials during the implementation of the technical assistance, particularly in relation to climate-resilient water management and technology deployment. These resources may support the contextual understanding of technology options and policy considerations but are not applied as prescriptive tools.