

Country	Tajikistan
Request ID#	2026000002
Title	Enhancing Weather and Climate Data Management Innovation in Tajikistan through an AI- and Observation-Based High-Resolution Data Management Platform
NDE	Name: Sunatullo Pirov Position: Deputy Director, Agency for Hydrometeorology of CEP under the Government of the Republic of Tajikistan Address: 13/1 B-Gafurov str, Dushanbe city Email: pirov.snt@gmail.com Phone: 992-88-808-8811.
Proponent	Name: Sunatullo Pirov Position: Deputy Director, Agency for Hydrometeorology of CEP under the Government of the Republic of Tajikistan Address: 13/1 B-Gafurov str, Dushanbe city Email: pirov.snt@gmail.com Phone: 992-88-808-8811.

Summary of the CTCN technical assistance

Tajikistan faces growing climate risks from glacier retreat, hydrological variability, and more frequent extreme weather events, which threaten water, energy, and food security. Although hydrometeorological infrastructure has improved, major gaps remain in data quality management, use of satellite observations, and institutional capacity to generate reliable climate information for decision-making.

This CTCN technical assistance will support Tajikistan in developing and piloting an AI-enabled climate data management and quality control system, starting with a proof-of-concept in the Dushanbe area focused on temperature and humidity observations. Over 15 months, the TA will design an observation data management framework, develop AI-based quality control methods, and strengthen capacity in climate data analysis, including the integrated use of satellite and ground-based observations.

The expected outcome is a validated and scalable approach to improving the reliability and usability of climate data for water management, disaster risk reduction, and climate-resilient planning. The TA will also help establish the basis for future national scale-up and follow-up investment.

Agreement:

(If possible, please use electronic signatures in Microsoft Word file format)

**National Designated Entity to the UNFCCC
Technology Mechanism**

Name: Sunnatulloh Pirzoda

Title: Deputy Director, Agency for
Hydrometeorology of CEP under the
Government of the Republic of Tajikistan

Date: 29-04-2026

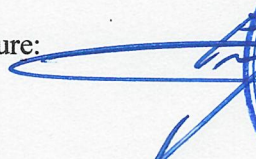
Signature: 

Designated Authority to the Adaptation Fund

Name: Bahodur Sheralizoda

Title: Chairman, Committee for Environmental
Protection under the Government of the
Republic of Tajikistan.

Date: 6.05.2026

Signature: 



**UNFCCC Climate Technology Centre and
Network (CTCN)**

Name: Ariesta Ningrum

Title: Director, CTCN

Date: 10.08.2026

Signature: 

1. Background and context

Tajikistan is highly vulnerable to climate change due to its dependence on glacier-fed hydrological systems. The country has already lost approximately 30% of its glacier area since 1930, with projections indicating further losses of 15–20% by 2050. Rising temperatures, increasing frequency of extreme weather events, and water stress are intensifying risks across the water–energy–food nexus.

Water-related hazards account for over 70% of natural disasters and cause economic losses of up to 1.4% of GDP annually. Despite these risks, Tajikistan lacks high-resolution, real-time climate data necessary for effective water resource management, disaster risk reduction, and climate adaptation.

Current hydrometeorological systems rely heavily on sparse ground observations with limited integration of satellite-based data and advanced analytics. Institutional and technical constraints further limit the capacity of the national hydrometeorological agency to deliver accurate forecasts and actionable climate information.

As a result, critical decision-making processes such as reservoir management, irrigation planning, flood forecasting, and early warning systems are constrained by incomplete and unreliable data, reducing the effectiveness of climate risk management for government institutions and vulnerable communities exposed to glacier-related and hydrological hazards.

This technical assistance aims to address these systemic gaps by introducing an AI-enabled, satellite-integrated climate data management approach, starting with a pilot in the Dushanbe region.

2. Problem statement

Tajikistan's ability to effectively adapt to climate change is significantly constrained by the lack of reliable, high-resolution, and integrated climate data systems. As a mountainous, glacier-dependent country, Tajikistan is experiencing rapid glacier retreat, increasing temperatures, and growing hydrological variability, leading to more frequent floods, droughts, and water stress. These impacts directly threaten water resources, hydropower generation, agricultural productivity, and disaster risk management.

Despite ongoing efforts to modernize hydrometeorological infrastructure, including the installation of automated observation stations, critical gaps persist in the management, quality, and utilization of climate data. Observation networks remain sparse in high-altitude regions where key hydrological processes originate, and existing systems rely heavily on fragmented and uneven-quality ground-based data. At the same time, satellite-based observations, although widely available, are not systematically integrated into national workflows due to the absence of operational data pipelines, standardized processing systems, and technical capacity.

In addition, Tajikistan lacks a centralized, AI-ready data management system capable of integrating multi-source data, performing automated quality control, and generating actionable climate information. Data quality assurance is largely manual, time-consuming, and inconsistent, limiting the reliability and timeliness of forecasts and early warning systems. Institutional constraints, including limited access to computing infrastructure, insufficient expertise in AI and Earth Observation, and weak data governance frameworks, further hinder effective use of climate information.

These challenges result in significant decision-making gaps across sectors. Water resource allocation, reservoir management, agricultural planning, and disaster preparedness are all affected by incomplete or unreliable data, increasing vulnerability to climate risks and reducing the effectiveness of adaptation measures.

Without targeted intervention to modernize climate data systems and build institutional capacity, Tajikistan will continue to face constraints in delivering accurate, timely, and decision-relevant climate information. This technical assistance addresses these systemic barriers by introducing an AI-enabled, integrated approach to climate data management and quality control, laying the foundation for improved climate resilience and evidence-based decision-making.

Furthermore, a gender evaluation and gender action plan (GAP) will be prepared and followed throughout the technical assistance (a template will be provided). ¹															
Activity B: Implementation A project steering committee will be formed, consisting of the implementing team (international and local consultants), the NDE, the project proponent(s), beneficiary(ies), and CTCN. The objective of this steering committee is for the implementing partner to report on progress, and to guide the implementation of the project at a high level. It is recommended that this steering committee is virtually meeting on a monthly basis.															
Activity C: End of implementation A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided). Potential project-end communication and dissemination activities (such as knowledge sharing webinar, dialogue with financial institutions, press release) may be conducted in collaboration with the CTCN Secretariat, subject to appropriateness.															
Mandatory deliverables: Deliverable A: Detailed work plan; M&E plan; gender assessment and gender action plan	X														
Deliverable B: Project Steering Committee meeting reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Deliverable C: Closure and Data Collection report; press release, webinar, dialogue with financial institutions															X
Output 1: Inception, National Climate Data Management and AI Integration Framework Developed This output establishes the foundational architecture required to modernize Tajikistan’s climate data ecosystem. It addresses fragmentation in current data systems and the lack of standardized, AI-ready data management by developing a coherent framework that integrates ground-based and satellite observations and supports advanced analytics.															

¹ Additional information is available under Section 10 of the response plan.

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[illegible]

[illegible]

4. Resources required and itemized budget:

Please provide an indicative overview of the resources required and itemized budget required to implement the CTCN technical assistance, including for M&E-related activities, using the table below. Important to note that minimum 5% of the budget should explicitly target gender specific activities related to the technical assistance (please see section 10 for further information on gender). A maximum of 20% of the budget can be allocated to procurement (e.g. infrastructure purchase, technology piloting). Once the Response Plan is completed, a Response Implementation partner(s) will be selected by the Climate Technology Centre (CTC). A detailed activity-based budget for the CTCN assistance will be finalized by the CTCN and selected Implementer.

Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	Input: Travel ² (Purpose, national vs. international, number of days)	Input: Meetings/events ³ (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Estimated cost <i>Please accumulate the costing (USD) at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan</i>	
					Minimum	Maximum
Mandatory Output: Project Management					USD 7,560	USD 8,400
Mandatory Activities: A: Beginning of implementation B: Implementation C : End of implementation	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Output 1: Inception, National Climate Data Management and AI Integration					41,580	46,200

² All budget values related to Daily Subsistence Allowance or logistical support for local participants shall remain as indicated.

³ All budget values related to the organization of meetings and events shall remain as indicated.

Framework Developed						
Activity 1.1: Inception, stakeholder alignment, and system assessment	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	International travel: 5 days	In-person workshop: 4 days	-	26,460	29,400
Activity 1.2: Design of integrated climate data management framework	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Activity 1.3: Development of AI-ready data standards and utilization approaches	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Output 2: AI-Based Climate Data Quality Control Pilot Implemented					22,680	25,200
Activity 2.1: Development of AI-based anomaly detection and quality control models	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400

Activity 2.2: Pilot implementation and operational validation in Dushanbe	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Activity 2.3: Performance evaluation and scalability assessment	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Output 3: Capacity Building and Institutional Strengthening Delivered					41,580	46,200
Activity 3.1: Development of training programme and materials	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Activity 3.2: Delivery of technical training and hands-on workshops	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	International travel: 5 days	In-person workshop: 4 days	-	26,460	29,400

Activity 3.3: Knowledge transfer and institutional embedding	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Output 4: Scale-up Roadmap and Sustainability Strategy Developed					41,580	46,200
Activity 4.1: Development of national scale-up roadmap	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Activity 4.2: Sustainability and financing strategy	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	-	-	-	7,560	8,400
Activity 4.3: Preparation of scale- up concept note for investment	IE1: 7 days IE2: 7 days IE3: 7 days NE1: 7 days NE2: 7 days NE3: 7 days	International travel: 5 days	In-person workshop: 4 days	-	26,460	29,400
Estimated range of costing for the entire Response Plan					154,980	172,200

5. Profile and experience of experts

Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan. Please note that an expert with experience in gender mainstreaming is required. The CTCN Gender and Climate Technology Expert Roster can help you identify a suitable expert: <https://www.ctc-n.org/networking-and-collaboration/gender-and-climate-technology-expert-roster>

Experts required	Brief description of required profile
International Experts	
Project Manager / Climate Data Systems and Digital Transformation Lead (IE1)	- Advanced university degree (Master's or equivalent) in Climate Science, Hydrology, Environmental Engineering, Data Science, Information Systems, or a closely related field. A Bachelor's degree in a relevant field may be accepted with at least 12 years of relevant professional experience. - Minimum 10 years of professional experience in climate change adaptation, climate data systems, or digital transformation of environmental information systems, including experience in developing countries. - Demonstrated experience leading complex multi-stakeholder technical assistance projects involving government institutions, international organizations, and development partners, including project management, stakeholder coordination, monitoring and evaluation, and delivery of high-quality technical outputs. - Strong expertise in climate data management systems, data governance, and integration of multi-source datasets (e.g., ground observations, satellite data). - Experience in developing implementation roadmaps, sustainability strategies, and system-level recommendations. - Experience working with UN agencies, CTCN, multilateral development banks, or climate finance-related projects is highly desirable. - Excellent written and oral communication skills in English.

Artificial Intelligence and Climate Data Analytics Expert (IE2)	· Advanced university degree (Master’s or equivalent) in Data Science, Artificial Intelligence, Computer Science, Applied Mathematics, Statistics, or a related field. A Bachelor’s degree may be accepted with at least 9 years of relevant professional experience. · Minimum 7 years of experience in applying AI or machine learning techniques to environmental, climate, or time-series datasets. · Demonstrated experience in developing AI-based anomaly detection, data quality control, or predictive analytics systems. · Strong practical experience with programming languages and tools such as Python and machine learning frameworks (e.g., TensorFlow, PyTorch, or similar). · Experience working with climate or meteorological datasets (e.g., temperature, humidity, precipitation) and applying time-series analysis methods. · Experience adapting AI solutions to operational environments with limited infrastructure and ensuring usability by institutions. · Strong analytical and technical documentation skills.
Earth Observation, Hydrometeorology, Capacity Building, and Scale-up Expert (IE3)	· Advanced university degree (Master’s or equivalent) in Remote Sensing, Meteorology, Hydrology, Geospatial Science, Environmental Science, or a related field. A Bachelor’s degree may be accepted with at least 9 years of relevant professional experience. · Minimum 7 years of experience in Earth Observation applications, hydrometeorological systems, or climate information services. · Demonstrated experience integrating satellite datasets (e.g., GPM, Meteosat, Sentinel or similar) with ground-based observations. · Experience designing data integration frameworks, climate information workflows, or operational systems. · Demonstrated experience in capacity building, including development and delivery of training programmes and technical workshops. · Experience preparing implementation roadmaps, sustainability strategies, and investment concept notes, including familiarity with climate finance mechanisms. · Strong facilitation and stakeholder engagement skills. · Excellent written and oral communication skills in English.
National Experts	

Hydrometeorology and Climate Data Expert (NE1)	• University degree (Bachelor's or higher) in Meteorology, Hydrology, Climate Science, Environmental Science, or a related field. • Minimum 5 years of experience in Tajikistan's hydrometeorological or environmental sector, preferably with the Agency for Hydrometeorology or related institutions. • Strong understanding of national observation networks, climate data systems, and operational challenges. • Experience supporting data collection, validation, analysis, and coordination with national stakeholders. • Fluency in Tajik and/or Russian, with working knowledge of English.
Data Systems and IT Specialist (NE2)	• University degree (Bachelor's or higher) in Computer Science, Information Systems, Data Engineering, Software Engineering, or a related field. • Minimum 5 years of experience in database management, data systems, IT infrastructure, or system deployment. • Experience supporting data integration, system customization, and technical troubleshooting in institutional environments. • Familiarity with environmental or climate datasets is an advantage. • Ability to support local implementation, maintenance, and knowledge transfer. • Fluency in Tajik and/or Russian, with working knowledge of English.
Gender and Social Inclusion Expert (NE3)	• Relevant university degree (Bachelor's or higher) in Gender Studies, Social Sciences, Development Studies, or a related field. • Minimum 5 years of experience in gender mainstreaming and social inclusion in climate change, environment, or development projects. • Proven ability to integrate gender considerations into technical projects, including training, stakeholder engagement, and monitoring frameworks. • Experience collecting and analyzing gender-disaggregated data. • Fluency in Tajik and/or Russian, with working knowledge of English.

6. Intended contribution to impact over time

This CTCN technical assistance is expected to generate sustained and progressive climate adaptation impacts over time by strengthening Tajikistan's climate data systems, institutional capacity, and readiness for scaling AI-enabled climate information solutions at national level.

Short-term impact

In the short term, the technical assistance will deliver immediate improvements in the reliability, quality, and usability of climate data through the development of an AI-enabled data management framework and the implementation of a pilot (PoC) in the Dushanbe region.

The introduction of AI-based anomaly detection and data quality control methods will enhance the consistency and accuracy of temperature and humidity datasets, reducing reliance on manual validation processes. At the same time, the integration of satellite and ground-based observations will demonstrate practical approaches to addressing current data gaps and improving climate monitoring.

Through targeted capacity-building activities, technical staff from TajikHydromet and related institutions will gain hands-on experience in AI applications, climate data management, and Earth Observation use. This will enable immediate improvements in data handling practices and strengthen institutional confidence in using digital and data-driven approaches.

Medium-term impact

In the medium term, the technical assistance will contribute to more effective and evidence-based decision-making across key sectors, particularly water resource management, hydropower operations, agriculture, and disaster risk reduction.

The methodologies, tools, and institutional practices introduced through the TA will support the gradual expansion of AI-based data quality management and integrated climate data use beyond the pilot area. These improvements are expected to benefit institutions responsible for water management, agriculture, hydropower operations, and disaster risk reduction, while indirectly improving resilience of vulnerable communities exposed to floods, droughts, and glacier-related hazards.

Institutional capacity built through training and knowledge transfer will help embed these practices within national systems, reducing dependence on external technical support. The strengthened data ecosystem will also facilitate improved coordination among institutions by providing more consistent and reliable information for decision-making.

Long-term impact

In the long term, this technical assistance will contribute to transformative, system-level change by supporting the modernization of Tajikistan's national climate information system and enabling wider adoption of AI-enabled data management approaches.

The scale-up roadmap and investment concept note developed under the TA will provide a foundation for mobilizing additional funding from national budgets and international climate

finance mechanisms (e.g., GCF, GEF, AF, MDBs), allowing expansion of the system to national level.

A more robust and integrated climate data system will strengthen Tajikistan's overall adaptive capacity, contributing to reduced disaster losses, improved water and energy management, enhanced agricultural resilience, and more effective climate policy planning.

Furthermore, the pilot approach and lessons learned may serve as a model for replication in other Central Asian countries facing similar challenges related to mountainous terrain, data gaps, and climate vulnerability, contributing to regional knowledge sharing and cooperation.

7. Relevance to NDCs and other national priorities

This CTCN technical assistance is strongly aligned with Tajikistan's national climate, development, and sectoral priorities. It directly supports the country's efforts to strengthen climate resilience through improved climate data systems, digital innovation, and institutional capacity building, in line with key national strategies and international commitments.

Alignment with Tajikistan's Nationally Determined Contribution (NDC)

The technical assistance directly contributes to the implementation of Tajikistan's updated Nationally Determined Contribution (NDC, 2020), which identifies the modernization of hydrometeorological services, improved climate data collection and management, and strengthened early warning systems as key priorities for adaptation.

In particular, the NDC emphasizes the need to enhance monitoring networks, improve data processing and forecasting capabilities, and adopt advanced technologies to support climate risk management and decision-making.

The proposed TA supports these priorities by introducing an AI-enabled climate data management approach that improves data quality, enhances the integration of satellite and ground-based observations, and strengthens institutional capacity to generate reliable and actionable climate information.

Alignment with National Adaptation Strategy to Climate Change (2019–2030)

The TA is closely aligned with the National Adaptation Strategy to Climate Change of the Republic of Tajikistan until 2030, which highlights the importance of science-based decision-making supported by reliable climate data.

The strategy identifies the Agency for Hydrometeorology as a key institution responsible for climate monitoring, risk assessment, and data provision, and calls for the development of national climate information systems, glacier monitoring, and improved hydrological data management.

By strengthening data quality management, integrating satellite observations, and introducing AI-based analytical approaches, the TA directly supports these strategic priorities and enhances the operational capacity of national institutions.

Alignment with GCF and ADB-supported Hydrometeorological Modernization (FP075)

The TA complements ongoing efforts under the Green Climate Fund (GCF) project "Institutional Development of the State Agency for Hydrometeorology of Tajikistan" (FP075), implemented with support from the Asian Development Bank.

While FP075 focused on infrastructure modernization, institutional strengthening, and development of digital platforms, gaps remain in data quality management, advanced analytics, and integration of multi-source datasets.

This TA addresses these gaps by introducing AI-based quality control and data integration approaches, thereby enhancing the effectiveness and sustainability of existing investments and supporting the next phase of system development.

Relationship with GCF and ADB-supported Glaciers to Farms (G2F) Regional Program (FP283)

This technical assistance is complementary to GCF FP283: Glaciers to Farms (G2F) Regional Program, approved on 30 October 2025 and under implementation since 8 January 2026, in which Tajikistan is one of nine participating countries. FP283 is a 100 per cent adaptation programme that supports climate-informed planning tools, capacity strengthening, and the development of bankable adaptation projects in glacier-dependent river basins across Central and West Asia.

While FP283 operates at a broader regional and programmatic scale, the present TA provides targeted national-level support to strengthen the underlying climate data systems required for such planning. By developing an AI-enabled climate data management framework, piloting AI-based quality control, and preparing a scale-up concept note, the TA helps address key technical and institutional gaps in Tajikistan and can serve as a practical building block for future implementation and investment under FP283.

Alignment with Long-Term Development and Climate Strategies

The TA also contributes to Tajikistan’s long-term development and climate strategies, including pathways toward low-emission and climate-resilient development. These strategies emphasize the importance of reliable data systems, modelling capacity, and evidence-based planning to support both adaptation and mitigation policies.

By improving the availability and reliability of climate data and enabling advanced analytics, the TA strengthens the technical foundation required for climate policy design, risk assessment, and long-term planning.

Contribution to National and Sectoral Priorities

More broadly, the TA supports national priorities across multiple sectors, including:

- Water resource management: improved data for allocation, reservoir management, and drought response
- Energy (hydropower): enhanced forecasting and planning for climate variability
- Agriculture: better climate information for irrigation planning and crop management
- Disaster risk reduction: strengthened early warning systems and preparedness

By addressing systemic data gaps and institutional constraints, the TA contributes to cross-sectoral resilience and supports integrated decision-making across the water–energy–food nexus.

8. Linkages to relevant parallel on-going activities:

This technical assistance is closely aligned with and complementary to several ongoing national, regional, and international initiatives in Tajikistan and Central Asia. It is designed to avoid duplication while strengthening synergies and addressing key technical gaps that are not fully covered by existing programmes.

Linkage with GCF FP075: Hydrometeorological Modernization

The TA is strongly complementary to the GCF-funded project “Institutional Development of the State Agency for Hydrometeorology of Tajikistan” (FP075), implemented with support from the Asian Development Bank.

FP075 focused on strengthening hydrometeorological infrastructure, institutional capacity, and digital platforms. However, gaps remain in advanced data quality management, integration of

satellite and ground-based observations, and application of emerging technologies such as artificial intelligence.

This TA directly addresses these gaps by introducing AI-based data quality control and integrated data management approaches. As such, it enhances the effectiveness, sustainability, and long-term impact of FP075 investments by enabling more reliable and actionable use of climate data.

Linkage with GCF FP283: Glaciers to Farms (G2F) Regional Programme

The TA is also closely linked to GCF FP283: Glaciers to Farms (G2F) Regional Programme, which includes Tajikistan as one of the participating countries and focuses on strengthening climate resilience in glacier-dependent river basins.

While FP283 operates at a regional and programmatic level, supporting climate-informed planning tools, institutional capacity, and investment development, this TA provides targeted national-level support to strengthen the underlying climate data systems required for such planning.

By improving data quality, enabling integration of satellite and ground observations, and developing an AI-based data management approach, the TA contributes directly to the technical foundations needed for effective implementation of FP283 in Tajikistan.

In addition, the scale-up roadmap and concept note developed under this TA may serve as inputs for future investment pipelines linked to FP283.

Linkage with ADB and Regional Initiatives

The TA is aligned with ongoing and planned initiatives by the Asian Development Bank (ADB) and other regional partners in Central Asia, particularly those focusing on climate resilience, water resource management, and digitalization of climate services.

In particular, the TA is relevant to emerging programmes such as the “Glacier to Farms” regional initiative and other efforts aimed at improving climate data, hydrological modelling, and decision-support systems in glacier-dependent regions.

By piloting innovative approaches to AI-based data quality management and integrated data use, the TA provides a technical foundation that can be leveraged by these broader regional initiatives.

Linkage with National and Institutional Initiatives

At the national level, the TA is aligned with ongoing efforts by TajikHydromet and other institutions to modernize data systems, improve forecasting capabilities, and strengthen climate services.

Linkage with WMO for the Regional Association II

In addition, TajikHydromet is currently working toward the establishment of a Regional Center for the Study of Cryosphere and Glacier Monitoring under WMO Regional Association II, which may provide future opportunities for regional cooperation, knowledge sharing, and scaling of climate data innovation approaches developed under this TA.

The TA supports these efforts by introducing new methodologies and tools that can be integrated into existing systems and workflows, rather than creating parallel structures. It also strengthens coordination among institutions by promoting standardized data management and improved data sharing practices.

9. Anticipated follow up activities after this technical assistance is completed:

The proposed technical assistance is designed as a foundational intervention that will enable a range of follow-up activities aimed at scaling, institutionalizing, and sustaining the results

achieved. The outputs of the TA, particularly the climate data management framework, AI-based pilot, and scale-up concept note, will provide a strong basis for subsequent investment and implementation.

Scale-up and National Deployment

Following completion of the TA, the AI-enabled climate data management system is expected to be gradually expanded beyond the pilot area (Dushanbe) to other regions of Tajikistan.

The scale-up roadmap developed under this TA will guide the phased national deployment, including expansion of data quality control systems, integration of additional observation stations, and broader use of satellite data.

National institutions, particularly TajikHydromet, are expected to take a leading role in operationalizing and maintaining the system.

Development of Investment Projects and Climate Finance Mobilization

The investment-oriented concept note developed under this TA will support the preparation of follow-up projects for submission to climate finance mechanisms and development partners, including the GCF, GEF, AF, and multilateral development banks (MDBs), and bilateral donors.

Potential follow-up activities may include:

- Development of a full-scale funding proposal
- Expansion of AI-based data management systems to national level
- Strengthening digital infrastructure and computing capacity
- Integration of climate data systems into sectoral decision-making tools

These activities will build on the technical and institutional foundations established under the TA.

Integration with Ongoing and Planned Programmes

The TA results are expected to be integrated into past, ongoing and future initiatives, including:

- GCF FP075 (Hydrometeorological modernization)
- GCF FP283 (Glaciers to Farms regional programme)
- ADB-supported climate resilience and water management programmes

The improved climate data systems and methodologies developed under this TA will enhance the effectiveness of these programmes by providing more reliable and actionable data for planning and implementation.

Institutionalization and Capacity Development

The capacity-building activities conducted under the TA will enable national institutions to continue applying and further developing the methodologies introduced.

Follow-up activities may include:

- Continued training and knowledge transfer within institutions
- Integration of AI-based data quality control into standard operating procedures
- Strengthening data governance frameworks and inter-agency coordination
- Development of national guidelines and technical standards

These steps will support long-term sustainability and reduce reliance on external expertise.

Regional Replication and Knowledge Sharing

The approaches and lessons learned from this TA may be shared with other countries in Central Asia facing similar challenges related to climate data gaps, mountainous terrain, and glacier-dependent systems.

Potential follow-up activities include:

- Knowledge exchange through regional platforms and networks
- Replication of AI-based data management approaches in neighboring countries
- Collaboration with regional initiatives and organizations

During the post-pilot phase, additional partnerships and financing opportunities may be explored to transition the platform from pilot implementation toward demonstration and national scale-up, including collaboration with development partners, regional climate initiatives, and climate finance institutions.

10. Gender and co-benefits:

Each technical assistance must integrate gender mainstreaming activities and lead to gender and other co-benefits. At least 5% of the technical assistance budget need to be allocated to gender mainstreaming activities. A suitable expert can be identified through the CTCN Gender and Climate Technology Expert Roster: <https://www.ctc-n.org/networking-and-collaboration/gender-and-climate-technology-expert-roster>

Gender benefits embedded in the implementation and as a result of activities:	Gender considerations will be systematically integrated throughout the implementation of the technical assistance to ensure equitable participation, capacity development, and access to benefits. A Gender Assessment will be conducted at the inception stage to identify gender-specific needs, barriers, and opportunities related to climate data systems, technical capacity, and access to climate information. Based on this, a Gender Action Plan (GAAP) will be developed and implemented by the implementing partner. During implementation, the project will ensure inclusive participation of women and men in all stakeholder consultations, training workshops, and capacity-building activities. Specific efforts will be made to promote women's participation in technical domains such as climate data management, artificial intelligence applications, and Earth Observation, where women are often underrepresented. Training programmes will be designed to be accessible and inclusive, taking into account potential barriers related to language, timing, and institutional roles. Sex-disaggregated data will be collected and monitored to track participation and outcomes. As a result of these activities, the TA is expected to increase the technical capacity and participation of women in climate data and digital climate services, strengthen institutional awareness of gender considerations in climate technology applications, and improve access to reliable climate information for women, particularly in climate-sensitive sectors such as agriculture and water management. At least 5% of the total technical
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	assistance budget will be allocated to support gender mainstreaming activities.
Other co-benefits embedded in the implementation and intended as result of the activities:	The technical assistance will generate multiple co-benefits across environmental, socio-economic, and institutional dimensions by improving the availability, quality, and usability of climate data in Tajikistan. From an environmental perspective, the TA will enhance the country's capacity to monitor climate variability and hydrological changes, contributing to improved water resource management, more accurate climate risk assessments, and strengthened disaster preparedness for floods and droughts. From a socio-economic perspective, improved climate data and information services will support better decision-making in key sectors such as agriculture, hydropower, and disaster risk management. This will contribute to more efficient resource allocation, reduced climate-related losses, and increased resilience of communities and livelihoods. From an institutional perspective, the TA will strengthen national capacities in digital climate services, including the use of artificial intelligence and Earth Observation data. It will also promote improved coordination among institutions through standardized data management practices and enhanced data sharing. In addition, the development of a scale-up roadmap and investment concept note will strengthen Tajikistan's readiness to access climate finance and support future investments in climate resilience.

11. Main in-country stakeholders in implementation of the technical assistance activities:

Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.

In country stakeholder	Role in implementation of the technical assistance
Agency for Hydrometeorology under CEP (NDE & Project Proponent)	- Lead technical counterpart, NDE, and project proponent. - Responsible for overall coordination, provision of climate data, participation in system assessment, pilot implementation, validation of outputs, and long-term operation and scale-up of the AI-based climate data system.
Committee for Environmental Protection (CEP): NDA to GCF	- Provides policy-level oversight and ensures alignment with national climate strategies and GCF programming. - Facilitates coordination with GCF processes and supports integration of TA outputs into future funding proposals.
Asian Development Bank (ADB)'s Country Office / National Focal Point	Key development partner supporting hydrometeorological modernization (e.g., FP075).

	Provides strategic guidance, ensures alignment with ongoing ADB-supported initiatives, and explores opportunities to integrate TA outputs into broader investment programmes.
Green Climate Fund (GCF)	- Strategic partner supporting climate adaptation investments (e.g., FP075 and FP283). - Provides a framework for potential scale-up of TA results through climate finance mechanisms and supports alignment with ongoing and future GCF programmes.
Ministry of Energy and Water Resources	- Key user of climate and hydrological data for water resource management and hydropower planning. Provides input on data needs and participates in validation of outputs.
Ministry of Agriculture	- End-user of climate information for irrigation planning and climate-resilient agriculture. - Participates in consultations, training, and validation of outputs.
Committee of Emergency Situations and Civil Defense	- Uses climate data for disaster risk reduction and early warning systems. - Provides feedback on usability of data products and participates in validation.
National research institutions and universities (including Tajik National University and Tajik Technical University)	Provide technical input, support knowledge transfer, and contribute to long-term sustainability and innovation in climate data systems.
Technical staff of TajikHydromet and related agencies	- Direct users of the AI-based system. - Participate in training, pilot implementation, and operational testing of data management approaches.
Women professionals and young specialists in climate-related fields	Target beneficiaries for gender-responsive capacity building and skills development in climate data, AI, and digital technologies.

12. SDG Contributions:

Instructions: Please complete the grey section below for **a maximum of three SDGs** that will be advanced through this TA. A complete list of SDGs and their targets is available here:

<https://sustainabledevelopment.un.org/partnership/register/>.

Goal	Sustainable Development Goal	Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs)
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	
3	Ensure healthy lives and promote well-being for all at all ages	
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	
5	Achieve gender equality and empower all women and girls	

6	Ensure availability and sustainable management of water and sanitation for all	By improving the availability and quality of climate and hydrological data, the TA supports more effective water resource management, including planning, allocation, and risk management. Enhanced data systems will enable better integration of climate information into water management decisions, contributing to resilience in glacier-dependent river systems.
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	
	7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services	
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	
	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	The TA introduces innovative digital solutions, including AI-based data quality control and integrated climate data systems, strengthening national digital infrastructure for climate services. It supports the adoption of advanced technologies and builds technical capacity in data analytics, contributing to sustainable and innovation-driven development.
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient and sustainable	
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	The TA enhances Tajikistan's adaptive capacity by improving the reliability and usability of climate data through AI-enabled data management and integration of satellite and ground-based observations. This supports more accurate forecasting, early warning systems, and climate-informed decision-making, particularly for flood and drought risks.
	13.2 - Integrate climate change measures into national policies, strategies and planning	
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	
	13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	

16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

13. Classification of technical assistance:

Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.

Please tick off the relevant boxes below	Primary	Secondary
☐ 1. Decision-making tools and/or information provision	☒	☐
☐ 2. Sectoral roadmaps and strategies	☐	☒
☐ 3. Recommendations for law, policy and regulations	☐	☐
☐ 4. Financing facilitation	☐	☒
☐ 5. Private sector engagement and market creation	☐	☐
☐ 6. Research and development of technologies	☐	☐
☐ 7. Feasibility of technology options	☐	☒
☐ 8. Piloting and deployment of technologies in local conditions	☐	☒
☐ 9. Technology identification and prioritisation	☐	☐

Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.

14. Monitoring and Evaluation process

Upon contracting of the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) NDE about overall satisfaction level with the technical assistance service provided; and (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance. Furthermore, the NDE together with the project proponent(s) will complete a periodic post-implementation form to track the impact of the activities beyond the technical assistance end date.

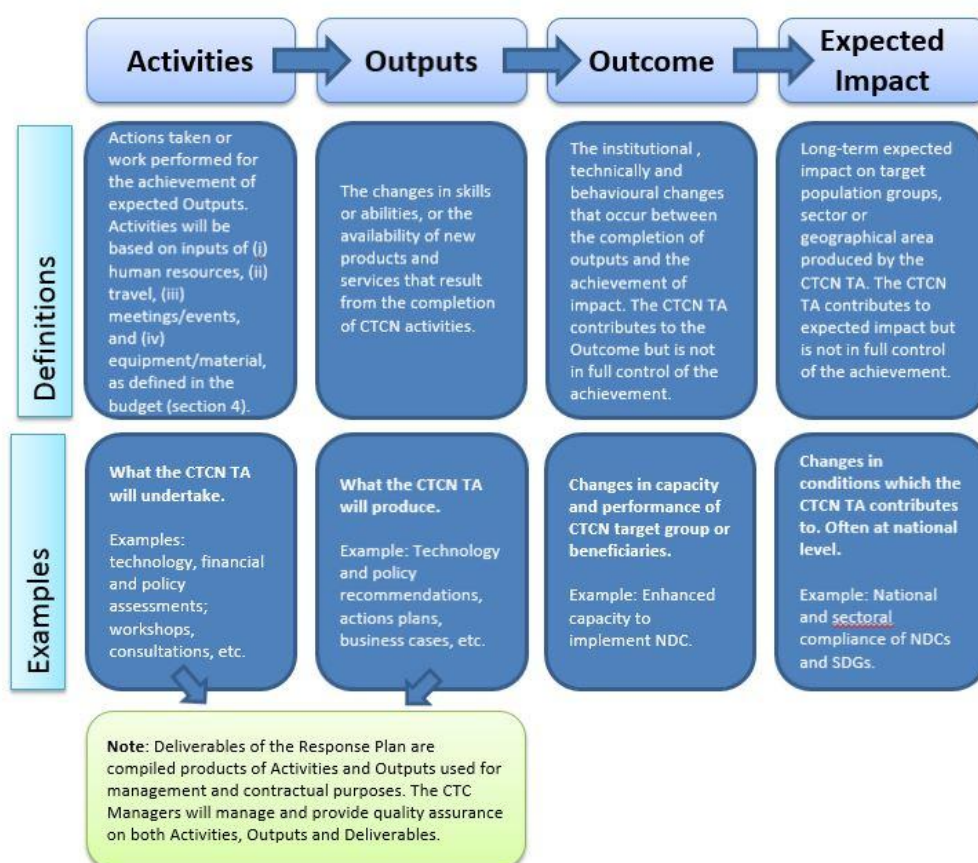
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

1. Objective of the Response Plan

The Response Plan is developed by CTCN specialists in response to a country request for technical assistance. It constitutes the Terms of Reference of the CTCN technical assistance that will be provided to the country and it provides the formulation of and subsequent basis for the monitoring and evaluation of the Response Plan implementation, as well as its expected outcomes and anticipated impacts.

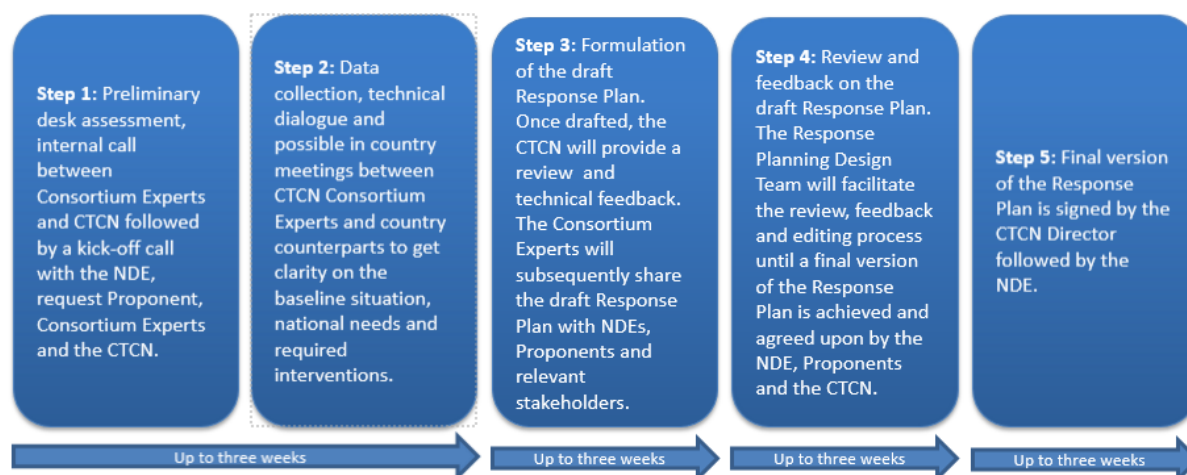
2. Results chain and Logical Framework Approach to be defined in the CTCN Response Plan

The result chain is the causal sequence that stipulates the necessary flow of actions and processes to achieve desired objectives and results – beginning with inputs, moving through activities and outputs, and culminating in individual outcomes. The outcome will contribute to the desired impact in the society. The Logical Framework Approach is an analytical process used to support objectives-oriented project planning and management. It provides a set of pre-defined concepts which are used as part of an iterative process to aid structured and systematic analysis and management of the CTCN technical assistance.



3. Process for designing the Response Plan

The Response Planning process should be completed over a period of up to 60 working days (12 weeks). Indicative steps and related timelines are laid out below:



4. Design Considerations

In order to maximize the impact of the technical assistance provided by the CTCN and provide an effective M&E process, the Response Plan should integrate as much as possible the considerations below:

Climate Technology focus: The Response Plan should have a clear focus on climate technologies, and identify activities that enable the identification, development, deployment or diffusion of one or several specific technologies (including equipment, techniques, knowledge and skills).

Barrier removal / Problem solving: The activities should contribute to address the specific problem statement identified in the Request. The barriers identified should be those hampering the identification, development, deployment or diffusion of one or several climate technologies or climate actions. Therefore, it may be necessary to limit the CTCN Response Plan to a set of activities for technical assistance commonly agreed with the NDE (and Proponent when needed) compared to the original request submitted. The CTCN will liaise with NDEs and Proponent in case the scope of the technical assistance deviates from the original request.

Use of the CTCN assistance by stakeholders: The Response Plan should identify clearly how the products of the CTCN assistance will be used in the short term once support is delivered, by who and when, to ensure it will lead to specific impacts in the country. The activities should engage the stakeholders that will use the concrete results of the assistance to deploy the technologies, including from the private sector, the public sector, research institutions, etc.

Within the scope of CTCN resources: The cost of the technical assistance provided by the CTCN cannot exceed USD 250,000 per Response Plan. Therefore, it may be necessary to prioritize activities and limit the CTCN Response Plan to a set of priority activities commonly agreed with the Proponent and the NDE to remain under this value. Under section 4 of the Response Plan template, an indicative activity based budget should be presented. The proposed budget is indicative and should present an estimated costing range per activity, output as well as a total costing range for the delivery of the

Response Plan. Once the Response Plan is finalised and published for tendering, interested parties will provide competitive offer against the indicative budget.

CTCN activities and outputs should be linkable to monitoring and evaluation indicators: All proposed activities and outputs must be linkable to monitoring and evaluation indicators that are specific, measurable, achievable, relevant, and time-bound. The monitoring and evaluation process and corresponding indicators will be developed by the Lead Implementer as part of the work plan and will allow the CTCN technology Manager to monitor the timeliness and appropriateness of the implementation.

Synergies with existing efforts: The Response Plan should focus on activities that are not already being fully supported or that are in the process of being fully supported by another national, regional or international organization. Synergies and complementarity also require that the CTCN assistance is not duplicating past activities. It is possible in the Response Plan to indicate co-financing from the government, the Proponent or another stakeholder, that will maximize the effectiveness of the CTCN assistance.

Gender mainstreaming: The CTCN mission is to build or strengthen developing countries' capacities to identify technology needs, to facilitate the preparation and implementation of technology projects and strategies taking into account gender considerations. The Response Plan must therefore describe how gender considerations will be included and monitored within the proposed activities, and any gender co-benefits that will be gained as a result of implementing the CTCN technical assistance. For that purpose, a Gender Assessment and Action Plan (GAAP) template has been designed to be followed by the implementation partner.