

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:	The Republic of Uzbekistan
Request title:	Developing and Validating a Sand and Dust Storm Monitoring and Impact-Based Early Warning Prototype and a National Centre Roadmap in Uzbekistan
NDE	Agency of Hydrometeorological Service under the Committee on Ecology and Climate Change of the Republic of Uzbekistan (Uzhydromet), Khabibullayev Sherzod Khabibullakhujayevich, Director, uzhymet@meteo.uz
Request Applicant:	Agency of Hydrometeorological Service under the Committee on Ecology and Climate Change of the Republic of Uzbekistan (Uzhydromet), Shavkat Kodirov, Head of the Department for the Study of Foreign Experience and Development of Scientific Research, sh.kadirov@meteo.uz , shavkatjonkodirov@gmail.com

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

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

Uzbekistan, a doubly landlocked country in the heart of Central Asia, is exceptionally vulnerable to climate change-induced hydrometeorological hazards due to its arid continental climate, low precipitation (80–200 mm/year in plain regions), and highly exposed landmass where over 78% consists of deserts and semi-deserts¹. Accelerated warming across Uzbekistan, averaging an increase of 0.27°C per decade, which significantly exceeds the global mean, has drastically intensified land degradation, soil desiccation, and severe drought frequencies across the Aral Sea Basin².

While the country faces diverse hydrometeorological risks such as flash floods and heatwaves, Sand and Dust Storms (SDS) have emerged as the most critical, cascading, and pervasive disaster threat to national security, public health, and rural livelihoods. The desiccation of the Aral Sea has exposed over 5.5 million hectares of dry seabed, forming the hyper-arid Aralkum Desert, which emits over 100 million tons of toxic saline dust and salt annually³. SDS events are not isolated wind phenomena; they trigger a destructive cascading disaster mechanism: *Desertification & Aralkum Drying* ▷ *Toxic Saline Dust Emission* ▷ *Farmland Salinization & Agricultural Ruin* ▷ *Air Quality Crises & Severe Respiratory Pathologies*.



Figure 1. Map of Central Asia (a), marking its countries, deserts and water bodies⁴

This cascading chain severely threatens national food security, damages agricultural productivity, and triggers acute health crises deep inside major urban centers and valley terrains⁵.

The catastrophic nationwide dust storm event of November 2021 stands as a stark warning of this escalating threat. Triggered by a cold polar anticyclone invading dried soils after extreme summer

¹ National Committee on Ecology and Climate Change of Uzbekistan, 2025. Updated Nationally Determined Contribution (NDC 3.0)

² UNFCCC, 2024. Fourth National Communication of the Republic of Uzbekistan under the UN Framework Convention on Climate Change

³ UNESCAP-APDIM, 2021. Sand and Dust Storms Risk Assessment in Asia and the Pacific

⁴ anks, J. R., Heinold, B., and Schepanski, K.: Dust aerosol from the Aralkum Desert influences the radiation budget and atmospheric dynamics of Central Asia, Atmos. 2024.

⁵ UNCCD-FAO, 2024. Guideline on the Integration of Sand and Dust Storm Management into Key Policy Areas

heatwaves (up to 46.5°C), a massive dust veil swept from the Turkestan region across central and eastern Uzbekistan, including Tashkent, the capital, and the Fergana Valley, the most eastern region. Horizontal visibility dropped below 200 meters, while ground-based monitoring recorded an extreme PM₁₀ concentration spiking to 18,000 µg/m³ in Tashkent, representing approximately 260 times the long-term average. Furthermore, PM_{2.5} levels remained above 300 µg/m³ for nearly 10 consecutive days, making it the worst dust storm in Uzbekistan since records began in 1871, overloading emergency health services (687 emergency calls in Tashkent within hours) and crippling transport infrastructure⁶.

Despite the severe impacts of events such as the 2021 storm, Uzhydromet's operational capacity remains constrained. Uzhydromet currently lacks an integrated operational workflow combining satellite-based SDS detection, atmospheric transport analysis, ground-based air-quality observations, impact-oriented risk assessment and user-tailored warning dissemination. Limitations in automated data processing, specialized SDS modelling and institutional data exchange hinder the provision of timely and actionable information to exposed communities and user groups with sufficient lead time for protective action.

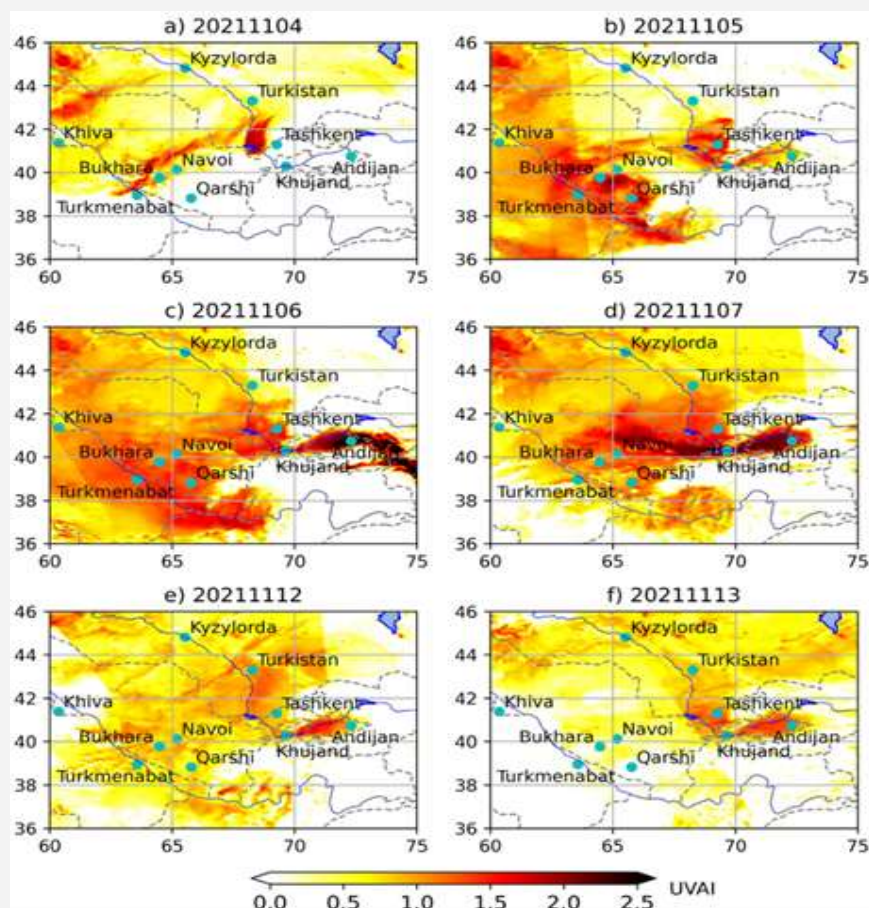


Figure. The SDS development in the period 4–7 and 12–13 November 2021 based on the TROPOMI UV-AI⁷

Existing national and internationally supported systems provide important hydrometeorological observation, visualization and emergency-management foundations. Building on these capacities, the proposed TA will assess SDS data and system readiness; develop and validate a limited functional

⁶ Nature, 2023. Study of the strongest dust storm occurred in Uzbekistan in November 2021

⁷ Scientific Reports, 2023. Study of the strongest dust storm occurred in Uzbekistan in November 2021

prototype using historical and sample data; design an operational workflow for SDS risk analysis, institutional review and user-oriented warning dissemination; and prepare a phased technical, institutional and investment roadmap for a future National SDS Monitoring Centre. By building on, rather than duplicating, existing observation, Territorial Operations Management Centres (TOMCs) and emergency-management capacities, the TA will establish a practical foundation for the progressive operationalization of SDS monitoring and early warning services in Uzbekistan.

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

Government-Level Legal and Institutional Framework and Efforts

The Government of Uzbekistan has established strong legal and strategic foundations for climate adaptation and disaster risk management. Climate risk management and hazard alerts are legally mandated through the *Law on Protection of Population and Territories from Natural and Technological Emergencies* (No. ZRU-790, 2022) and the *Law on Hydrometeorological Activity* (No. ZRU-745, 2022)⁸. High-level strategic directives are reinforced through the Strategy 'Uzbekistan-2030', Goal 70 (Targets 325–327) and Goal 98 (Targets 429–431), which mandate achieving 96% accuracy in early hazard warnings, establishing automated disaster monitoring systems, and classifying 100% of Mahallas (Communities) by risk indicators⁹.

Crucially, national adaptation directives in NDC 3.0 (2025) and the Sectoral National Adaptation Plan (SNAP) for Emergencies (2025–2030) explicitly assign Uzhydromet and the Ministry of Emergency Situations (MES) to modernize early warning systems, automate real-time satellite imagery analytics using AI, and implement the Programme for Combating Sand and Dust Storms 2024–2030¹⁰.

Uzhydromet's Mandate and Gaps in SDS Interventions

The Agency of Hydrometeorological Service (Uzhydromet) under the National Committee on Ecology and Climate Change of the Republic of Uzbekistan is the core agency dedicated to national hydrometeorological observations, monitoring, and forecasting of extreme weather disasters, including sand and dust storms. In cooperation with the Ministry of Emergency Situations (MES) and related line ministries, Uzhydromet has consistently conducted observation and forecasting activities for localized torrential rains, heatwaves, and dust storms. While Uzhydromet has established basic observation protocols for localized rains and floods, it currently lacks an operational digital architecture or specialized AI modelling system to handle SDS hazards. Major international projects concluding around 2026–2027 provide essential baseline assets but leave the SDS modelling gap unfilled.

- “Capacity-building to establish an integrated and enhanced transparency framework in Uzbekistan to track the national climate actions and support measures received” Project (2022–

⁸ Government of Uzbekistan, 2022. Law on Hydrometeorological Activities No. ZRU-745

⁹ Government of Uzbekistan, 2026. Presidential Decree No. UP-21 on Strategy Uzbekistan-2030 Revision

¹⁰ National Committee on Ecology and Climate Change of Uzbekistan, 2025. Updated Nationally Determined Contribution (NDC 3.0)

2026, FAO/GEF, USD 1.319M) establishes climate data statistical baselines and Enhanced Transparency Framework tracking.

- *Enhancing Multi-Hazard Early Warning System to increase resilience of Uzbekistan communities to climate change induced hazards” Project (SAP022) (2021–2027, UNDP/GCF/MES/Uzhydromet, USD 9.999M) supports the modernization of Uzbekistan’s impact-based multi-hazard early warning system through strengthened observation infrastructure, operational visualization, institutional coordination and community-level preparedness, primarily addressing floods, mudflows, landslides, avalanches and hydrological drought. Its investments include Automatic Weather Stations (AWS), Territorial Operations Management Centres (TOMCs) and last-mile early warning and preparedness mechanisms.*
- *“Finland-Uzbekistan Meteorological Project (FUME)” Project (2022–2026, Ministry for Foreign Affairs of Finland/FMI, EUR 2M) introduces general automated forecasting tools with FMI.*

Targeted Synergy and Strategic Integration

Available documentation indicates that these projects provide important foundations for hydrometeorological observation, forecasting, operational visualization, institutional coordination and last-mile early warning. However, they do not establish a dedicated operational workflow for SDS detection, source-area identification, atmospheric transport analysis, historical-event validation and user-oriented SDS warning services. The proposed CTCN TA will address this specific gap by developing and validating a limited functional SDS prototype and preparing the technical, institutional and investment roadmap for a future National SDS Monitoring Centre. The prototype architecture will be designed to support potential use of, and integration with, relevant observation, visualization and warning-distribution capacities established under SAP022, subject to confirmation of their operational status, data accessibility and technical compatibility¹¹.

Specific technology¹² barriers (up to one page):

While Uzhydromet has made progress in expanding basic weather observation hardware, it faces severe, specialized technical barriers in predicting and responding to Sand and Dust Storms.

Limited Integration of Satellite, Meteorological and Air-Quality Data for SDS Monitoring

Current SDS monitoring relies primarily on manual observations and separately managed meteorological, satellite and air-quality information. Available satellite aerosol products, such as TROPOMI UV Aerosol Index and MODIS aerosol or dust products, are not yet systematically integrated with surface meteorological observations, ground-based PM_{2.5}/PM₁₀ data and atmospheric transport analysis in a unified operational workflow. This limits Uzhydromet’s ability to consistently detect SDS events, identify

¹¹ UNDP-GCF, 2025. Sectoral National Adaptation Plan for Emergencies in Uzbekistan 2025-2030

¹² *“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)*

probable source areas, analyse movement pathways and provide timely risk information to affected users.¹³

Limited Operational Capacity for SDS Transport and Dispersion Analysis

Forecasting relies on traditional, coarse meteorological parameterization. Uzhydromet does not yet have an operational SDS modelling workflow combining satellite-based detection with appropriate atmospheric transport or atmospheric-chemistry models, such as HYSPLIT or WRF-Chem, and locally available ground observations. This limits its capacity to analyse SDS movement and dispersion risks and to assess the feasibility and data requirements for future quantitative PM_{2.5}/PM₁₀ estimation.

Missing Impact-Based Vulnerability Modeling for SDS

Existing forecasts provide simple weather warnings without calculating socio-economic impacts. Specialized algorithms that integrate SDS detection and dispersion-risk outputs with GIS-based vulnerability layers (e.g., agricultural cotton fields, respiratory health risks, urban solar/transport infrastructure) do not exist¹⁴.

Institutional and Last-Mile Communication Gaps for SDS Alerts

Data streams between Uzhydromet, the Ministry of Emergency Situations (MES), and local Mahalla communities lack Common Alerting Protocol (CAP) APIs tailored for SDS¹⁵. Actionable warnings fail to reach vulnerable groups, such as farmers, elderly, outdoor workers.

Contribution to Programme of Work 2023-2027:

As per 3rd Programme of Work of the CTCN¹⁶, please indicate the system transformation area, key enablers and cross-sectoral themes related to the request:

System transformation areas (mandatory)

- | | | | |
|--|---|---|--|
| ☐ Water-Energy-Food Nexus | ☐ Sustainable Mobility | ☐ Energy Systems | ☒ Buildings and Infrastructure |
| ☐ Business and Industry | | | |

Key enablers (optional)

- | | |
|--|--|
| ☒ National Systems of Innovation | ☒ Digitalization |
|--|--|

Cross-sectoral themes (optional)

¹³ Nature, 2023. Study of the strongest dust storm occurred in Uzbekistan in November 2021

¹⁴ IEA PVPS, 2024. Dust and sand storms: risks and recommendations for monitoring and mitigation).

¹⁵ UNDP-GCF, 2025. Sectoral National Adaptation Plan for Emergencies in Uzbekistan 2025-2030

¹⁶ <https://www.ctc-n.org/resources/ctcn-third-programme-work-2023-2027>

☒ Gender ☒ Youth ☐ Indigenous Peoples

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 | | |

Please add other relevant sectors:

Technical assistance requested (up to one page):

Overall Objective

The overall objective of this Technical Assistance (TA) is to design, test, and validate an advanced Digital Sand and Dust storm (SDS) Impact-Based Early Warning System (SDS-EWS) and Monitoring Architecture for Uzbekistan, directly operationalizing core adaptation targets set in NDC 3.0, Strategy Uzbekistan-2030, and Presidential Resolution No. 338. Focusing specifically on dust storms originating from the Aralkum Desert and regional drylands, the TA will utilize satellite remote sensing, surface meteorological data, and air quality monitoring streams to develop and validate functions for SDS detection, probable source-area identification, movement tracking and dispersion-risk analysis, while assessing the feasibility and data requirements for future quantitative PM_{2.5}/PM₁₀ estimation.

Furthermore, the project will establish a functional prototype, validate system accuracy using historical case studies, design Last-Mile alert dissemination mechanisms integrated with relevant systems and infrastructure supported under ongoing projects, and formulate a comprehensive technology, data, and operational roadmap for the National SDS Monitoring Centre.

Over the 15-month implementation period, the TA is structured into four integrated components aligned with national priorities.

Components & Activities

Component 1. SDS Data & System Readiness Assessment and Additionality Analysis

Activity of Component 1	Description
<i>Activity 1.1. Stocktaking & Gap Analysis of Existing SDS-Related Data, Infrastructure and Systems</i>	Conduct a detailed assessment of existing SDS-relevant observation assets, data systems and operational tools, including Uzhydromet's meteorological stations, available ground-based PM _{2.5} /PM ₁₀ observations, satellite aerosol products, TOMCs supported under SAP022 and relevant FUME tools. The assessment will identify data availability, spatial and temporal coverage, quality, accessibility, interoperability and operational data-exchange bottlenecks.
<i>Activity 1.2. SDS Data Architecture & Satellite/Air Quality Data Pipeline Design</i>	Design technical protocols for accessing, preprocessing, integrating and visualizing satellite aerosol products, ground-based PM _{2.5} /PM ₁₀ observations and reanalysis or forecast meteorological data (ERA5/MERRA-2) within a unified SDS data architecture.
<i>Activity 1.3. Additionality Verification & Use-Case Specification</i>	Define one or two priority SDS use cases, focusing on Aralkum-origin event detection and movement tracking and downwind exposure-risk information for selected affected areas, while ensuring complementarity with SAP022 and other relevant initiatives.

- Deliverable 1. Uzbekistan SDS Data and System Readiness Assessment, Additionality Analysis and Technical Architecture Report

Component 2. SDS Functional Prototype Development & Historical Case Validation

Activity of Component 2	Description
<i>Activity 2.1. Satellite-Based SDS Detection and Atmospheric Transport Modelling</i>	Develop and configure a prototype workflow combining satellite aerosol and dust products with HYSPLIT or another appropriate atmospheric transport model to detect SDS events, identify probable source areas, analyse movement pathways and identify potentially affected downwind areas. Assess the feasibility and data requirements for future quantitative PM _{2.5} /PM ₁₀ estimation.
<i>Activity 2.2. SDS Operational Prototype Implementation</i>	Develop a limited functional software prototype using actual historical or sample data to visualize detected SDS events, probable source areas, observed and modelled movement pathways, dispersion-risk levels and potentially affected areas. Where technically feasible, test selected near-real-time data feeds for operational demonstration.
<i>Activity 2.3. Historical Disaster Reconstruction & PoC Validation</i>	Reconstruct selected historical SDS events, including the November 2021 event, to assess the prototype's ability to detect event occurrence, identify probable source areas, reproduce movement direction and timing and identify potentially affected areas. Where sufficient ground-based PM observations are available, compare modelled risk patterns with observed concentration increases and assess the feasibility of future quantitative PM _{2.5} /PM ₁₀ forecasting.

- Deliverable 2. SDS Functional Prototype, Technical Documentation and Historical-Event Validation Report

Component 3. SDS Alert Dissemination, Use-Case Design & MHEWS Linkage

Activity of Component 3	Description
<i>Activity 3.1. GIS Vulnerability Map-Linked Automated Alert Logic</i>	Define SDS risk levels, impact thresholds and recommended protective actions for one or two priority user groups, and develop CAP-compatible alert-generation logic by linking prototype outputs with relevant exposure and vulnerability information.
<i>Activity 3.2. Integration Architecture Design with MES Systems</i>	Design API specifications, institutional workflows and SOPs for the potential integration of SDS risk information with relevant TOMCs and last-mile mobile/SMS channels supported under SAP022, subject to confirmation of their operational status and technical compatibility.
<i>Activity 3.3. SDS Warning Product and User Demonstration</i>	Conduct a limited pilot demonstration in one or two selected SDS-affected locations to test the end-to-end workflow from prototype analysis and institutional review to the dissemination of tailored SDS information or warnings. Assess timeliness, message clarity, user comprehension and the practicality of recommended protective actions.

- Deliverable 3. SDS Alert Protocol, MHEWS Integration Architecture, SOPs and User Demonstration Report

Component 4. SDS Monitoring Centre Roadmap, Capacity Building & Scale-Up Investment Strategy

Activity of Component 4	Description
<i>Activity 4.1. Technical Capacity Building & Invitational Training Programme</i>	Organize an invitational study visit and technical training programme for relevant Uzhydromet and MES specialists. Potential host institutions may include relevant WMO Regional Training Centres, WMO SDS-WAS associated institutions and operational dust-forecasting centres, subject to consultation and confirmation.
<i>Activity 4.2. Operational Roadmap Formulation for Uzhydromet SDS Monitoring Centre</i>	Prepare an institutional, technical, staffing, operational and financial roadmap for a future National SDS Monitoring Centre within Uzhydromet, including priority functions, data flows, system requirements, observation needs, model validation, SOPs, O&M responsibilities and phased investment requirements.
<i>Activity 4.3. Follow-Up Proposal Development & Validation Workshop</i>	Conduct a national stakeholder validation workshop and, where feasible, an appropriate regional knowledge-sharing session. Prepare a preliminary scale-up investment concept and financing roadmap identifying institutional ownership,

phased investment needs, O&M requirements and potential national, bilateral, multilateral or climate-finance pathways.

- Deliverable 4. National SDS Monitoring Centre Operational Roadmap, Capacity-Building Package and Preliminary Scale-Up Investment Concept

Expected timeframe:

15 Months. This 15-month TA will be executed across four integrated phases.

- Phase 1 (Months 1–3) will assess existing SDS-relevant data, observation assets and operational systems and design a unified satellite-meteorological-air-quality data workflow;
- Phase 2 (Months 4–8) will develop and validate a limited functional prototype for SDS detection, probable source-area identification, movement tracking and dispersion-risk visualization using available satellite, meteorological, ground-based PM and historical-event data;
- Phase 3 (Months 9–12) integrates automated CAP-compliant alert logic with existing infrastructure for a field pilot; and
- Phase 4 (Months 13–15) will focus on capacity building and preparation of the operational roadmap for a future National SDS Monitoring Centre, a national validation workshop, an appropriate regional knowledge-sharing session where feasible, and finalization of a preliminary scale-up investment concept and financing roadmap.

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

Gender-Responsive Early Warning and Capacity Development

The TA will assess the availability of sex-, age- and disability-disaggregated exposure and vulnerability information and engage women and other vulnerable user groups in the design and testing of SDS information and warning products. Component 3 will assess whether warning messages are accessible, understandable and linked to practical protective actions for different user groups, including women, older persons, persons with disabilities and outdoor workers. A minimum target of 30% participation by women will be applied to technical training, user consultations and validation activities, subject to the staffing composition of participating institutions.

Socio-Economic and Environmental Co-Benefits

Improved access to timely and user-oriented SDS risk information is expected to support protective action in public health, outdoor work, agriculture, transport and other exposed sectors. The prototype and Centre roadmap may also strengthen the evidence base for soil-salinity management, desertification response, ecosystem restoration and future regional cooperation on SDS monitoring. These benefits will depend on subsequent operationalization and scale-up and are not treated as guaranteed impacts of the TA alone.

Anticipated follow-up activities after this technical assistance are completed:

Integration and Expansion

This TA project acts as a vital bridge to fully absorb the observation infrastructure and baseline data established through Uzhydromet's current three international cooperation projects concluding in late

2026–early 2027 while filling the critical technology gaps in AI impact prediction and SDS monitoring. Aligning with the momentum of the GCF B.45 Board meeting in 2026, which marks an expansion of international climate adaptation, loss, and damage support for Central Asia, and the launch of the 3rd GCF Replenishment period (GCF-3, 2028–2031), this project will utilize its PoC/Pilot validation outcomes to finalize a large-scale GCF Full Project and Fund for Responding to Loss and Damage (FRLD) initiative draft to scale up interventions across all 14 regions of Uzbekistan and transboundary areas in Central Asia.

To maximize technical precision and project feasibility prior to submitting the large-scale funding application, a phased financing track utilizing the GCF Readiness Programme and Project Preparation Facility (PPF) will be activated. Based on the GCF Project Concept Draft and stakeholder Validation Workshop outcomes generated under Component 4 of this TA, the project team will collaborate with Uzbekistan’s National Designated Authority and Accredited Entities to apply for GCF PPF resources. This will systematically support the preparation of detailed Feasibility Studies, Social and Environmental Screening Procedures, and engineering designs required for nationwide expansion.

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
Agency of Hydrometeorological Service of the Republic of Uzbekistan (Uzhydromet)	National Designated Entity (NDE), Lead beneficiary and long-term owner; provides available data and computing resources; leads prototype validation and future Centre operation.
National Committee on Ecology and Climate Change of the Republic of Uzbekistan	Strategic policy oversight, inter-institutional alignment, and formal endorsement of GCF readiness/investment linkages.
Ministry of Emergency Situations (MES) of the Republic of Uzbekistan	CAP, TOMC integration, warning approval workflows and emergency SOPs.
Ministry of Water Resources & Ministry of Agriculture of the Republic of Uzbekistan	Key data suppliers and end-users; co-design eco-flow, irrigation, and basin-level risk modelling protocols.
Academic & Training Partners (e.g., Central Asian Green University, WMO RTC)	Scientific collaboration partners for capacity building, model validation, and joint applied research.

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

Please describe how the technical assistance is consistent with national climate priorities such as: Nationally Determined Contribution, national development plans, poverty reduction plans, technology needs assessments (incl. whether this request refers to any technologies prioritized within Technology

Action Plans), Long-term Low Emission Development Strategies, National Adaptation Plans, GCF Country Programme, sectorial strategies and plans, etc.

Reference document (please include date of document)	Extract (please include chapter, page number, etc.).
Nationally Determined Contribution (NDC)	The Republic of Uzbekistan's NDC 3.0 prioritizes Emergency Management as a key adaptation sector, directly aligning with this TA to establish a Multi-Hazard Impact-Based Early Warning System (MHEWS). The TA helps operationalize core targets set in the 'Uzbekistan-2030' Strategy, and integrated into NDC 3.0, including 100% early warning coverage for hazardous weather and 98% river flow forecast accuracy. By addressing extreme transboundary water vulnerabilities (80% external supply), the TA directly contributes toward fulfilling the sector's identified \$21 million adaptation finance need by 2030 and supports the nation's broader green disaster prevention agenda. - Updated Nationally Determined Contribution of the Republic of Uzbekistan (NDC 3.0) for the period up to 2035 within the Framework of the Paris Climate Agreement, Page 10, Page 26, Page 27, Pages 37-38, Pages 51-52
Technology Needs Assessment and Technology Action Plan	This TA is consistent with Uzbekistan's TNA as it directly addresses "Early warning systems" and "Disaster risk reduction," which are selected as priority sectors. Additionally, it implements the national NDC adaptation priority of "development of early warning systems about dangerous hydrometeorological phenomena" to enhance climate resilience - Request for Technology Needs Assessment and Technology Action Plan and roadmaps for NDC implementation for Republic of Uzbekistan, Page 3-5
National Adaptation Plans	Full National Adaptation Plan (NAP) is currently under development, Sectoral NAP on Emergency Situation (2025) directly supports this Technical Assistance by legally assigning Uzhydromet and the Ministry of Emergency Situations to modernize early warning systems, automate real-time satellite imagery analytics using AI, and expand hydro-meteorological monitoring for natural risks pursuant to Cabinet Resolution No. 362 and Strategy Uzbekistan 2030.
Long-term Low Emission Development Strategies	Uzbekistan's Long-Term Low Emission Development Strategy is currently being formulated and discussed, aiming for Net-Zero and a low-carbon transition by 2055–2060. Once the LTS is officially approved, this TA will have a very strong alignment, both directly and indirectly, as a core execution mechanism for climate adaptation and climate risk management within Uzbekistan's national response system to climate change.
Add others here as relevant	▪ <i>Strategy "Uzbekistan – 2030"</i> aligns with this TA via climate targets under Goals 70 and 98 to boost early warning reliability (up to 96-98%) and establish disaster monitoring systems. By using hydrological

	modelling, satellite analytics, and AI to deliver actionable warnings for extreme events, the TA fulfils these national resilience goals. - Strategy "Uzbekistan - 2030" (Стратегия "Ўзбекистон — 2030"), Section III, Goal 70 (Target 325, 326, 327), Section V, Goal 98 (Target 429-432), Annex 1(1-ИЛОВА), 123 and 166 p • <i>Law on Hydrometeorological Activities (2022) & Presidential Resolution No. PP-4896</i> back Uzhydromet's mandate for official hazard alerts. The TA implements legal requirements for reliable, accessible warnings using AI and satellite analytics, fulfilling state policies for ICT utilization, scientific innovation, and international cooperation. - Law on Hydrometeorological Services of the Republic of Uzbekistan (Закон Республики Узбекистана о Гидрометеорологической деятельности, 10 октября 2021) • <i>Programme for Combating Sand and Dust Storms for the period 2024–2030 (Presidential Resolution No. 338)</i> mandates modernizing forecasting and early warning systems. This framework aligns with the TA's goal to build an MHEWS that turns raw meteorological data into actionable alerts, fulfilling legal directives through advanced technologies and data-sharing workflows. - Clause 2 (focusing on advanced prevention technologies), Clause 4 (mandating public dissemination of hydrometeorological data)
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Development of the request (up to 2000 characters including spaces):

This request was developed through a nationally driven, multi-stakeholder consultative process initiated and led by Uzhydromet in its capacity as the National Designated Entity (NDE).

During the development process, technical workstreams and consultation meetings were convened involving key national stakeholders, including Uzhydromet, the National Committee on Ecology, Climate Change, and the Ministry of Emergency Situations (MES). Through these inter-agency consultations, stakeholders collaboratively identified critical operational bottlenecks in AI-based impact forecasting, satellite data assimilation for Sand and Dust Storms (SDS), and multi-level CAP-compliant 'Last-Mile' warning dissemination.

These identified national priorities were translated into the four structured components of this Technical Assistance to ensure complete alignment with Uzbekistan's technical capabilities, Nationally Determined Contributions (NDC), and national climate adaptation objectives. Prior to official submission, the request underwent a formal review and received full approval and endorsement from the NDE.

Background documents and other information relevant for the request:

- Law on Protection of Population and Territories from Natural and Technological Emergencies (No. ZRU-790, 2022)
- Law on Hydrometeorological Activity (No. ZRU-745, 2022)
- National State of the Environment Report of Uzbekistan (2023)
- Fourth National Communication (FNC) of the Republic of Uzbekistan under the UNFCCC (2024)
- GCF SAP022 Project Interim Evaluation Report (UNDP/GCF, August 2024)

- Uzbekistan SNAP Emergencies Report (2025)
- Updated Nationally Determined Contribution (NDC) of the Republic of Uzbekistan (NDC 3.0) for the period up to 2035 within the Framework of the Paris Climate Agreement (2025)
- UNECE 4th Environmental Performance Review of Uzbekistan (UNECE, 2026)
- Relevant Uzhydromet internal report and Presentation Materials

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 and paragraph 4, 7 and 8 of 14/CP.24 that addresses Linkages between the Technology and the Financial Mechanisms¹⁷.

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 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. This includes the active engagement as NDE together with the key project proponent / beneficiary in regular project steering meetings.

¹⁷ Please see:

https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

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. This includes the completion of NDE feedback and post-implementation forms.

Signature:

NDE name: Khabibullayev Sherzod Khabibullakhujayevich

Date: 28/08/2026 y

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.