Guidelines:

To ensure a smooth and complete submission of your request for technical assistance to the Climate Technology Centre & Network (CTCN), please adhere to the following guidelines:

1. **Completion of Request Form**
   The **Request Submission Form** must be thoroughly completed by the requesting organization in coordination with the **National Designated Entity (NDE)** of the country concerned.
2. **Signature Requirement**
   The completed form must be **signed by the NDE** of the respective country.
   ➤ A current list of NDEs is available here: UNFCCC NDE Contact List
3. **Submission Format**
   The Request Form may be submitted in one of the following formats:
   • A **Word file** with a **digital signature**, or
   • A **scanned PDF** file bearing the **handwritten signature** of the NDE, accompanied by the **editable Word version** of the same form.
4. **Multi-Country Submissions**
   For requests jointly submitted by **multiple countries**, each involved country's **NDE must sign an identical version** of the Request Submission Form. These signed forms must be submitted together.
5. **Collaboration with GCF NDAs**
   If the technical assistance request is intended to support the **Green Climate Fund (GCF) Readiness Programme**, the NDE is encouraged to collaborate with the respective country's **National Designated Authority (NDA)** for the GCF during the preparation and submission of the request.

Requesting country or countries:	Cambodia
Request title:	Strengthening climate resilience of water-energy-food nexus management in Cambodia through technology transfer and capacity development
NDE	Name: Mr. Ou Chanthearith Position: Director, Department of Science and Technology, General Directorate of Policy and Strategy, Ministry of Environment (MOE) Role: National Focal Point for the Climate Technology Centre & Network (CTCN) Email: chanthearithccd@hotmail.com/chanthearithdst2023@gmail.com/ ou.chanthearith@moe.gov.kh Address: Morodok Techo Building (LOT 503) Tonle Bassac, Chamkarmorn, Phnom Penh, Cambodia
Request Applicant:	Name: Mr. Ou Chanthearith Position: Director, Department of Science and Technology, General Directorate of Policy and Strategy, Ministry of Environment (MOE) Role: National Focal Point for the Climate Technology Centre & Network (CTCN) Email: chanthearithccd@hotmail.com/chanthearithdst2023@gmail.com/ ou.chanthearith@moe.gov.kh Address: Morodok Techo Building (LOT 503) Tonle Bassac, Chamkarmorn, Phnom Penh, Cambodia

Climate objective:

☒ Adaptation to climate change

☐ Mitigation of climate change

☐ Combination of adaptation and mitigation of climate change

Justification:

The technical assistance directly supports **adaptation** by enhancing climate-resilient water-energy-food (WEF) nexus management in the 3S River Basin (Se San, Srepok, Sekong) through upgraded Decision Support Systems (DSS), improved hydrometeorological monitoring, climate forecasting integration, and institutional capacity building.

This will enable:

- **Improved flood and drought risk management** (short-, seasonal-, and long-term planning);
- **Data-driven water allocation** to balance hydropower, agriculture, and ecosystem needs; and
- **Enhanced climate resilience** for vulnerable communities dependent on water and food security.

Geographical scope:

☐ Community level

☒ Sub-national

☒ National

☐ Multi-country

Geographical Focus:

Description:

The technical assistance will be **piloted in the 3S River Basin (Se San, Srepok, and Sekong sub-basins)**, focusing initially on the **Se San Basin** in northeastern Cambodia. This basin is highly vulnerable to climate variability, with increasing risks from hydrological changes, floods, and droughts due to upstream hydropower development and climate change.

The Se San Basin was selected because:

- It represents a **critical transboundary system** linked to Cambodia's commitments under the Mekong Agreement and CNMC Strategic Plan; and
- It offers **manageable scale** for piloting climate-resilient DSS upgrades, data systems, and WEF integration before **scaling to other basins** (Srepok, Sekong, Tonle Sap, Mekong mainstream).

Scalability:

All tools, models, and capacity-building developed under this project will be **designed for replication** and application across Cambodia's other major basins, ensuring national-level benefits beyond the pilot area.

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

Cambodia is one of the most climate-vulnerable countries in Southeast Asia, exposed to increasing risks from **floods, droughts, extreme rainfall, and hydrological variability**. The **3S River Basin** (Se San,

Srepok, and Sekong) in northeastern Cambodia, and particularly the **Se San River Basin**, is a **critical hotspot** where climate change impacts directly threaten water, energy, and food security.

The Se San Basin is a **transboundary system**, influenced by upstream hydropower development in Laos and Vietnam, which alters flow regimes and exacerbates downstream vulnerabilities. Climate change compounds these pressures by increasing **variability in seasonal flows**, shifting flood patterns, and intensifying **dry-season water scarcity**.

Key climate-related risks in the Se San Basin include:

- **Flooding and drought extremes** disrupting agricultural production, damaging infrastructure, and affecting rural livelihoods;
- **Altered flow regimes** impacting fisheries and sediment transport, undermining food security and ecosystem health;
- **Reduced reliability of water supply** for agriculture, hydropower (reduced energy supply in the area), and domestic use due to uncertain rainfall and reservoir operations; and
- **Limited adaptive capacity** at institutional and community levels due to weak data, outdated tools, and insufficient forecasting.

Technology and institutional gaps limit Cambodia's ability to adapt effectively:

- CNMC's current **Decision Support System (DSS)** lacks integrated **climate change and WEF nexus modules** to simulate hydrological, environmental, and socio-economic scenarios;
- **Insufficient hydrometeorological (hydromet) monitoring** in the 3S Basin, with limited real-time data integration into basin planning;
- **Weak data management and sharing** between national agencies and transboundary partners; and
- **Limited technical expertise** in advanced modelling, climate risk assessment, and scenario-based basin planning.

The Se San Basin offers a **manageable pilot area** for testing and upgrading climate-resilient water-energy-food (WEF) management tools, before scaling to the full 3S Basin and other national basins. **Strengthening CNMC's DSS, data systems, and institutional capacity in Se San** will directly support Cambodia's **NDC 3.0 Adaptation Actions #62 and #63**, the **Cambodia Climate Change Strategic Plan 2024–2033**, and the **CNMC Strategic Plan 2024–2028**.

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

Cambodia has taken progressive steps to address climate change risks in water-energy-food (WEF) management, guided by the **Cambodia Climate Change Strategic Plan 2024–2033**, the **NDC 3.0**, and the **CNMC Strategic Plan (2024–2028)**.

At the **national level**, key actions include:

- **Policy frameworks**: National Adaptation Programme of Action (NAPA), Strategic National Action Plan for Disaster Risk Reduction, and sectoral strategies integrating climate resilience;
- **Technical tools**: Development of the Cambodia National Mekong Committee's (CNMC) **Decision Support System (DSS)** for integrated basin planning although it requires updating with climate and WEF modules; and
- **Monitoring networks**: Hydromet stations operated by MOWRAM and CNMC although

coverage in the 3S Basin remains limited and data integration is weak.

At the **basin and transboundary level**, CNMC actively cooperates under the **Mekong River Commission (MRC)** framework:

- Collaboration with Vietnam and Laos on **3S Basin coordination** and data sharing;
- Participation in MRC's **State of the Basin Report (SOBR)** and **Basin Development Strategy (BDS)**, including climate risk integration; and
- Engagement with MRC's **Regional Flood and Drought Management Centre** for early warning and flood forecasting.

Despite these achievements, **gaps persist**: DSS tools lack climate resilience modules; hydromet data systems are outdated; and institutional capacity for scenario-based WEF planning in the Se San Basin is limited. The proposed CTCN Technical Assistance will **build on these foundations**, upgrading tools, strengthening capacity, and piloting a scalable model in Se San.

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

National context

Cambodia faces significant gaps in the technology, data, and institutional capacity required to manage the Se San River Basin—and the broader 3S Basin—in a climate-resilient way. The **Cambodia National Water Sector Status Report (2015)** identified weak monitoring and assessment systems as a critical barrier, while the **Mid-Term Review of the Cambodia Climate Change Strategic Plan (2014–2023)** found limited domestic capacity to generate, analyze, and integrate climate and hydrological data.

Key technology barriers relevant to Se San Basin and scalable to other basins include:

1. **Decision Support Systems (DSS) outdated and incomplete**
   - CNMC's DSS is functional but lacks **integrated climate change impact modules**, **WEF nexus planning tools**, and **automated scenario analysis**; and
   - Limited interoperability with MOWRAM's hydromet systems and the MRC's regional models restricts real-time and transboundary decision-making.
2. **Inadequate hydrometeorological (hydromet) monitoring network**
   - Real-time monitoring stations in the Se San Basin are few, with **data gaps in flow, rainfall, water quality, and sediment load**; and
   - Existing stations lack automated data transmission and require upgraded **network and server infrastructure** at CNMC for continuous data capture.
3. **Data integration and information systems**
   - Weak integration between hydromet, Earth Observation (EO), and socio-economic datasets limits comprehensive WEF assessments; and
   - Data is often stored in disconnected formats, making it **difficult to generate actionable indicators** for planners.
4. **Institutional technical capacity**
   - CNMC and provincial staff have limited training in **advanced hydrological modelling, climate scenario analysis, and WEF-based decision tools**; and
   - There is **no sustainable capacity plan** for maintaining, upgrading, and operating the DSS, network infrastructure, and data systems.
5. **Financial and operational sustainability**

- Current technology upgrades are project-based without a **long-term financing mechanism** for operation, maintenance, and further scaling; and
- This affects both **system reliability** (server downtime, outdated software) and **expansion potential** to other basins.

Conclusion
Without targeted technical assistance, these barriers will continue to limit Cambodia's ability to respond to climate risks in the Se San Basin and beyond. Addressing them will require **upgraded DSS modules (WEF & climate resilience)**, strengthened **hydromet and network infrastructure**, improved **data integration**, and **capacity building** for sustainable operation—forming the basis of the proposed CTCN Technical Assistance.

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:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

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

Technical assistance requested (up to one page):

The Cambodia National Mekong Committee (CNMC) requests CTCN technical assistance to strengthen **climate-resilient water-energy-food (WEF) nexus management** in the **Se San River Basin** as a pilot area, with designed scalability to the broader 3S Basin and other river basins in Cambodia.

Objective
To upgrade and operationalize CNMC's **Decision Support System (DSS)**—integrated with hydromet and climate data—while enhancing institutional capacity and developing a sustainability roadmap. This will improve climate-resilient planning for floods, droughts, and WEF trade-offs, in line with Cambodia's

NDC3.0, NAP, **Cambodia Climate Change Strategic Plan (CCCSP) 2024-2033** and CNMC Strategic Plan (2024–2028).

Scope
The TA will focus on the **Se San Basin pilot**, strengthening CNMC's DSS modules, **network and server infrastructure**, hydromet data integration, and cross-sectoral applications (water, energy, agriculture, forestry). Lessons and methods will be designed for **scaling to other basins**.

Proposed Components & Activities

Component 1: Gap & Needs Assessment (Co-Lead: CNMC/MoE)

- Inception meeting to confirm pilot scope, roles, and detailed workplan;
- Review of CNMC DSS functionality, hydromet system status, and institutional capacity needs; and
- Mapping of data gaps (hydrological, climate, socio-economic) and prioritization of WEF-related decision requirements.

Component 2: Strengthening CNMC DSS (Lead: CNMC)

- Upgrade CNMC DSS with **WEF modules** (water allocation, hydropower, irrigation, ecosystem flows) and **climate change scenarios;**
- Integration of real-time hydromet and Earth Observation (EO) data;
- **System & Network Infrastructure Recovery & Installation** to ensure reliable DSS operation;
- Development of stakeholder dashboards and data visualization portals; and
- Training for CNMC, MOWRAM, and provincial staff on DSS operation, data analysis, and interpretation for decision-making.

Component 3: Roadmap & Sustainability Plan (Co-Lead: CNMC/MoE/MOWRAM)

- Sustainability plan for CNMC DSS, data systems, and institutional expertise;
- Long-term operations and maintenance plan (including network, servers, hydromet data pipelines); and
- Financing strategy and identification of scaling pathways to other basins (Sre Pok, Sekong, Tonle Sap tributaries).

Expected Outcomes

- **Upgraded DSS** for climate-resilient WEF planning in Se San Basin, ready for scaling;
- **Strengthened institutional capacity** in CNMC, MoE, MOWRAM, and provincial offices;
- **Improved hydromet data integration** and real-time decision support; and
- **Sustainability roadmap** with clear financing and O&M plan.

Timeframe
12 months

Budget
USD 250,000 – covering DSS upgrade, infrastructure recovery, data integration, capacity building, sustainability planning, and project management.

Expected timeframe:

The expected timeframe is 12 months

Component 1: Improvement and Development of DSS

- **Activity 1.1**: Upgrade CNMC DSS to enhance data management and forecasting capacity → **Month 1 – Month 3**
- **Activity 1.2**: Integrate new modules (scenario analysis, forecasting tools) → **Month 3 – Month 6**

Component 2: Capacity Building and Training

- **Activity 2.1**: Conduct technical training for CNMC and stakeholders on DSS operation & maintenance → **Month 4 – Month 7**
- **Activity 2.2**: Organize hands-on training on advanced technologies and decision-making outputs → **Month 7 – Month 9**

Component 3: Policy Support and Stakeholder Engagement

- **Activity 3.1**: Convene national & regional forums for dissemination and knowledge exchange → **Month 9 – Month 11**
- **Activity 3.2**: Support integration of DSS outputs into national strategy & database development → **Month 10 – Month 12**

Total Duration: 12 months (Month 1 → Month 12)

Gantt-style table

Component	Activities	Timeframe
1. DSS Improvement	1.1 Upgrade CNMC DSS	M1–M3
	1.2 Add new modules (scenario/forecasting)	M3–M6
2. Capacity Building	2.1 Training on DSS O&M	M4–M7
	2.2 Hands-on training on new tools	M7–M9
3. Policy & Stakeholder Engagement	3.1 National forum	M9–M11
	3.2 Policy integration & database support	M10–M12

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

The proposed technical assistance will contribute to more inclusive and sustainable water resources management in the 3S River Basin, with scalable benefits to other basins in Cambodia. By upgrading the CNMC DSS and integrating climate, hydrological, and socio-economic data, the project will improve equitable access to water resources, strengthen food and energy security, and reduce climate-related risks for all population groups.

Women, rural communities, and vulnerable groups often bear disproportionate impacts from water

scarcity, floods, and droughts. The TA will apply **gender-responsive approaches** consistent with MRC and CTCN gender mainstreaming guidelines, ensuring at least **30% women's participation** in consultations, trainings, and decision-making processes.

Co-benefits will include:

- **Enhanced resilience** of rural livelihoods and agriculture through better early warning and planning;
- **Improved food security** by supporting reliable water allocation for agriculture and fisheries;
- **Stronger institutional capacity** for disaster risk reduction, benefiting all sectors dependent on the WEF nexus; and
- **Community empowerment** through participatory planning and accessible climate/water information.

This gender-responsive and inclusive approach will ensure that technical outputs translate into **long-term, socially equitable benefits** across Cambodia's river basins.

Key stakeholders:

The technical assistance will be coordinated by the **Cambodia National Mekong Committee (CNMC)** as the lead implementing agency, in collaboration with the **Ministry of Environment (MoE)** as the National Designated Entity (NDE) to CTCN, and the **Ministry of Water Resources and Meteorology (MOWRAM)** as the primary technical authority on hydrometeorology and river basin management.

Lead and Core Stakeholders

- **Cambodia National Mekong Committee (CNMC)** – Lead coordination, DSS upgrade and integration, technical oversight, stakeholder engagement, and linkages to regional Mekong cooperation.
- **Ministry of Environment (MoE)**– NDE; policy alignment; sustainability roadmap; coordination with climate strategies (CCCSP, NDC, NAP); oversight of environmental safeguards and gender mainstreaming.
- **Ministry of Water Resources and Meteorology (MOWRAM)** – Hydromet data provision, technical input for modelling, operation and maintenance sustainability of monitoring networks.

Supporting Stakeholders

- **Provincial Departments of Water Resources and Meteorology (PDWRAMs)** in Ratanakiri, Stung Treng, and Mondulkiri – Local-level implementation, infrastructure maintenance, and data reporting.
- **Tonle Sap Authority** – Linkages to downstream hydrological impacts and ecosystem services.
- **Ministry of Agriculture, Forestry and Fisheries (MAFF)** – Integration of WEF outcomes with agriculture, fisheries, and forestry planning.
- **Ministry of Rural Development (MRD)** – Rural water supply infrastructure and community engagement.
- **Ministry of Economy and Finance (MoEF)** – Financial oversight and potential future investment mobilization.
- **National Committee for Disaster Management (NCDM)** – Flood/drought early warning, disaster preparedness.
- **Local Communities and Water User Associations** – Key beneficiaries and participants in

participatory planning and monitoring.

- **Development Partners, NGOs, Academia** – Technical backstopping, knowledge generation, and capacity building support.

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity Department of Science and Technology	• Overall oversight of the TA • Formulate strategies for the concept note, advisory support on local climate change adaptation and propose solution option, applicable/suitable technology • Planning process/project management and co-organize the consultation workshop and oversee activities/events among the counterparts • Monitoring and evaluation of overall reports, feasibility study result and assessment review
The Cambodia National Mekong Committee (CNMC)	**Day-to-day management and coordination of the TA**: • Act as the **national focal point** for TA implementation, ensuring alignment with national priorities and CNMC's mandate. • Coordinate with the Ministry of Environment (NDE) and liaise with the Climate Technology Centre and Network (CTCN). • Manage overall planning, implementation, and monitoring of TA activities. • Facilitate communication and coordination among stakeholders (line ministries, agencies, academic institutions, and local authorities). • Ensure that data and technical outputs from the TA are integrated into the **CNMC Decision Support System (DSS)** and national water-energy-food nexus planning. • Provide logistical and administrative support for training workshops, stakeholder consultations, and dissemination events. • Report progress and challenges regularly to CNMC leadership and NDE.
Ministry of water resources and meteorology (MOWRAM)	• Address scientific and political issues related to national and international water resources. • Provide technical data, policy inputs, and recommendations on water resources management. • Through the Department of Meteorology, manage meteorological data, hydrological monitoring, and forecasting to support DSS enhancement. • Contribute to policy dialogue and international coordination related to water and climate resilience.
Provincial Department of Water Resources and Meteorology	• Oversee construction, operation, and maintenance of irrigation and flood protection works at the provincial level.

<table>
<tr><td>(PDWRAM)</td><td>• Provide local-level data and practical insights into water resources management.
• Support the implementation of TA activities through provincial coordination.
• Facilitate stakeholder consultations and community engagement at the provincial level.</td></tr>
<tr><td>Only state key stakeholder involved for implement the TA</td><td>TOR Matrix for Key Stakeholders in TA Implementation

<table>
<tr><th>Stakeholder</th><th>Terms of Reference (TOR) / Key Roles</th></tr>
<tr><td>Cambodia National Mekong Committee (CNMC)</td><td>• Focal point and lead coordinator of the TA
• Manage day-to-day operations, reporting, and communication with CTCN and MoE (NDE)
• Facilitate inter-ministerial coordination and stakeholder engagement
• Ensure TA aligns with national Mekong and climate priorities</td></tr>
<tr><td>Ministry of Environment (MoE/NDE)</td><td>• Act as the National Designated Entity (NDE) for CTCN
• Endorse and supervise TA proposal submission and follow-up
• Ensure compliance with UNFCCC/CTCN frameworks
• Guide integration of TA results into national climate change strategies</td></tr>
<tr><td>Ministry of Water Resources and Meteorology (MOWRAM)</td><td>• Provide scientific and technical guidance on water resources and meteorology
• Supply hydrological and meteorological data for DSS enhancement
• Support scenario modeling, forecasting, and analysis
• Contribute to policy dialogues at national and transboundary levels</td></tr>
<tr><td>Provincial Departments of Water Resources and Meteorology (PDWRAMs)</td><td>• Implement TA-related activities at sub-national level
• Provide local operational data on irrigation, flood, and drought management
• Support stakeholder consultations and community engagement
• Coordinate with CNMC and MOWRAM for provincial-level monitoring and reporting</td></tr>
</table></td></tr>
</table>

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

The proposed technical assistance is directly aligned with Cambodia's climate change strategies, sectoral policies, and regional commitments.

Nationally Determined Contribution 3.0 (Updated NDC, 2025):

- *Adaptation Action #62*: Establish, improve, modernize and rehabilitate an automated nation-wide meteorology monitoring network and data management system in order to collect and transmit meteorological data to improve meteorological forecasting for short, medium and long range and support early warning systems;
- *Adaptation Action #63*: Establishment and modernization of a centralized and standardized meteorological and hydrological data centre for water management; and
- *Enabling Action #4*: Strengthen subnational capacity to assess, manage, and respond to climate change and disaster risks in their local areas and enhanced climate change coordination mechanism and other coordination mechanisms.

Cambodia Climate Change Strategic Plan (CCCSP 2024–2033):

- Strategic outcome 1.4: Strengthen sustainable and resilient water resources;
- Strategic outcome 2.2: Strengthen disaster risk reduction, preparedness plan and recovery across communities (coastal communities, Tonle Sap and Mekong River riparian communities);
- Strategic outcome 2.4: Strengthen resilience of vulnerable groups (such as children and local communities) and mainstream GEDSI in climate actions and resilience;
- Strategic outcome 2.5: Strengthen sustainability and resilience measures (including climate

smart technologies, regenerative agriculture, etc) in the agriculture and food value chain for a sustainable food system;
- Strategic outcome 3.2: Increasing targeted information education, awareness raising, communication and training on climate change;
- Strategic outcome 3.5: Strengthen access to technical assistance for multi-stakeholder capacity building; and
- Strategic outcome 3.6: Address data and information gaps for effective monitoring and evaluation.

CNMC Strategic Plan (2024–2028):

- *Strategic Direction 4*: Monitoring and assessment of climate change impacts in the Mekong Basin, focusing on the Se San and 3S sub-basins; and
- *Strategic Direction 5*: Improvement of CNMC's information systems and operational efficiency. The pilot in the Se San Basin will provide a scalable model for national application.

National Adaptation Plan (NAP):

- Calls for basin-specific vulnerability assessments and integration of climate information into water, energy, and agriculture planning.

Regional Commitments (MRC 1995 Agreement & Basin Development Strategy 2021–2030):

- Supports transboundary cooperation, joint basin monitoring, and climate-adaptive water-energy-food (WEF) nexus planning.

This TA ensures Cambodia meets its national and regional obligations by establishing a robust, climate-resilient DSS platform in the Se San Basin with clear pathways for replication to the 3S Basin and beyond.

Reference document (please include date of document)	**Extract** (please include chapter, page number, etc.).
Nationally Determined Contribution (NDC)	***Adaptation Action #62*: Establish, improve, modernize and rehabilitate an automated nation- wide meteorology monitoring network and data management system in order to collect and transmit meteorological data to improve meteorological forecasting for short, medium and long range and support early warning systems; ***Adaptation Action #63*: Establishment and modernization of a centralized and standardized meteorological and hydrological data centre for water management; and ***Enabling Action #4*: Strengthen subnational capacity to assess, manage, and respond to climate change and disaster risks in their local areas and enhanced climate change coordination mechanism and other coordination mechanisms.
Technology Needs Assessment	Cambodia's **Technology Needs Assessment and Technology Action Plan for Climate Change Adaptation** (March 2013) identified water resource management and agriculture as priority sectors for adaptation. The TNA

	highlighted several key constraints that remain highly relevant today: • **Data gaps and limited monitoring systems**: Lack of comprehensive hydrological and climate datasets impedes accurate vulnerability assessment and scenario planning (TNA, Ch. 3, p. 12–15); • **Insufficient Decision Support Systems (DSS)**: Limited capacity to model climate impacts, assess risks, and support integrated water-energy-food (WEF) nexus planning (TNA, Ch. 4, p. 20–22); • **Low institutional and technical capacity**: Agencies require targeted capacity building in climate modelling, DSS operation, and interpretation of outputs for policy decisions (TNA, Ch. 5, p. 28–30); and • **Funding limitations**: Lack of sustainable financing for technology deployment, maintenance, and scaling (TNA, Ch. 5, p. 30). While the TNA is over a decade old, its recommendations for **strengthening data systems, upgrading DSS tools, and building institutional capacity** align directly with the proposed CTCN technical assistance. This project addresses the original TNA's identified priorities while integrating **updated climate projections, advanced modelling tools, and Earth Observation (EO) data**, with the Se San River Basin serving as the pilot for scalable national implementation.
National Adaptation Plans	**National Adaptation Plans (NAPs) – Cambodia** Cambodia is among the most climate-vulnerable countries in the world, facing risks from floods, droughts, sea-level rise, and extreme weather. To address these risks, the Royal Government of Cambodia has developed a **National Adaptation Plan (NAP)** that provides a long-term framework for climate-resilient development. **Key Features of Cambodia's NAP:** • **Vulnerability Assessment:** Identifies priority sectors (agriculture, water resources, infrastructure, health) and most climate-sensitive regions, including the Mekong River Basin and Tonle Sap system; • **Adaptation Strategy:** Sets out sector-specific measures to reduce vulnerability and strengthen resilience in line with Cambodia Climate Change Strategic Plan (CCCSP) 2024–2033; • **Implementation Plan:** Defines priority actions, resources, and timelines. Includes integration with national development policies such as the Rectangular Strategy and National Strategic Development Plan (NSDP); and • **Monitoring & Evaluation:** Establishes mechanisms to track progress, evaluate adaptation effectiveness, and adjust measures as conditions change. **Water Resource Management in the NAP:**

	• Strengthening hydrometeorological monitoring networks for early warning systems; • Enhancing basin-level planning and transboundary water governance through CNMC and the Mekong River Commission (MRC); • Integrating climate information into water allocation, agriculture, and infrastructure development; and • Supporting community-based adaptation measures, particularly in flood- and drought-prone areas. **Alignment with Se San Basin Pilot:** The Se San Basin pilot aligns with NAP priorities by: • Enhancing climate-resilient Decision Support Systems (DSS); • Improving real-time data collection, analysis, and forecasting; • Building capacity for cross-sectoral (water-energy-food) adaptation planning; and • Creating a scalable model for replication in other priority basins.
Nationally Appropriate Mitigation Actions	Nationally Appropriate Mitigation Actions (NAMAs) **Nationally Appropriate Mitigation Actions (NAMAs) – Cambodia** Cambodia's **Nationally Appropriate Mitigation Actions (NAMAs)** form part of its strategy to reduce greenhouse gas (GHG) emissions while pursuing sustainable development. Although Cambodia's emissions are relatively low, NAMAs prioritize mitigation measures with strong co-benefits for adaptation, economic growth, and social inclusion. **Key Sectors for NAMAs:** • **Forestry & Land Use:** Reducing deforestation, enhancing sustainable forest management, and promoting reforestation to increase carbon sequestration; • **Energy:** Expanding renewable energy generation (hydropower, solar, biomass) and improving energy efficiency in infrastructure and industries; • **Agriculture:** Promoting climate-smart agriculture to reduce methane emissions from rice cultivation and improve soil carbon storage; and • **Waste Management:** Reducing methane from organic waste through composting, biogas production, and improved solid waste management systems. **Relevance to the Se San Basin Pilot and WEF Nexus:** While NAMAs are primarily mitigation-focused, the Se San Basin pilot contributes to NAMA objectives through: • **Optimized Hydropower Operation:** Using CNMC DSS to improve hydropower scheduling and water allocation, reducing reliance on fossil fuels and maximizing renewable energy efficiency;

	• **Climate-Smart Water Use in Agriculture:** DSS-driven water allocation improves irrigation efficiency, reducing energy demand for pumping and minimizing GHG emissions; and • **Forestry and Ecosystem Services:** Supporting basin-wide water-energy-food management can help maintain forested catchments, improving carbon sinks. **Co-Benefits:** These mitigation contributions also create adaptation and development benefits, such as improved water security, reduced flood/drought impacts, and enhanced livelihood resilience—consistent with Cambodia's dual approach to adaptation and mitigation under its Updated NDC (2020).

Add others here as relevant	**Nationally Appropriate Mitigation Actions (NAMAs) – Cambodia (Expanded)**
	
	Cambodia's **Nationally Appropriate Mitigation Actions (NAMAs)** reflect voluntary mitigation measures under the UNFCCC, designed to support sustainable development while contributing to global climate efforts. The Royal Government of Cambodia prioritizes NAMAs in sectors that also enhance adaptation, economic resilience, and sustainable livelihoods.
	
	Core Sectors in Cambodia's NAMAs
	
	• **Forestry and Land Use:**
	  ○ Reduce deforestation and degradation through sustainable forest management and protected area expansion; and
	  ○ Promote reforestation and afforestation, especially in upstream watershed areas like the Se San Basin, to enhance carbon sequestration and protect hydrological cycles.
	• **Energy:**
	  ○ Increase renewable energy production from hydropower, solar, and biomass; and
	  ○ Enhance energy efficiency in irrigation systems, water pumping, and municipal water supply.
	• **Agriculture:**
	  ○ Promote climate-smart agriculture, including alternate wetting and drying (AWD) in rice production to reduce methane emissions; and
	  ○ Improve soil carbon sequestration through integrated crop-livestock-forestry systems in the basin.
	• **Waste Management:**
	  ○ Reduce methane emissions through community-scale composting and biogas systems in rural communities; and
	  ○ Strengthen municipal solid waste management in towns within the Se San/3S sub-basin.
	
	Additional Relevant NAMAs for Se San / 3S Basin Pilot

	• **Water-Energy-Food (WEF) Nexus Optimization:**
	  ○ Enhance hydropower operations through DSS to maximize renewable energy output while safeguarding fisheries and agriculture; and
	  ○ Reduce fossil fuel consumption by improving hydropower efficiency and better scheduling of energy supply.
	• **Transport and Rural Infrastructure:**
	  ○ Promote low-carbon transport solutions for agricultural value chains (e.g., improving logistics to reduce emissions).
	• **Tourism and Ecosystem Services:**
	  ○ Develop low-carbon ecotourism in the basin linked to protected forest and river ecosystems.
	• **Industrial and Small Enterprise Efficiency:**
	  ○ Encourage small-scale agro-processing industries to adopt renewable energy sources and energy-efficient technologies.
	
	Alignment with Se San / 3S Basin Pilot
	The Se San Basin pilot integrates NAMA objectives by:
	
	• Supporting **renewable hydropower optimization** and **energy efficiency** via DSS-enhanced operation;
	• Protecting **forested catchments** for both carbon and water storage benefits;
	• Promoting **low-emission agriculture** through improved water allocation; and
	• Building a scalable **low-carbon development model** for replication across Cambodia's river basins.

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

The request has been prepared through a series of meetings and consultations with line ministries and key stakeholders. The project Applicant and NDE is the Department of Science and Technology, with the proponent being the Cambodia National Mekong Committee (CNMC). Other stakeholders, including the Ministry of Water Resources and Meteorology (MOWRAM), have been fully informed of the initiative and pledged their support.

This technical assistance request builds on more than a decade of national, regional, and transboundary initiatives in climate-resilient water resources management. Cambodia, through the CNMC, has prioritized integrated Water–Energy–Food (WEF) nexus management in line with the Nationally Determined Contribution (NDC 3.0), the Cambodia Climate Change Strategic Plan (2024–2033), and the CNMC Strategic Plan (2024–2028).

Recent consultations with the Ministry of Environment (MoE), MOWRAM, and development partners identified the Se San River Basin—part of the 3S system—as the pilot area. The basin faces acute climate risks, including floods, droughts, and hydropower impacts, but also offers strong institutional readiness for piloting scalable solutions. Lessons from the Se San will inform future expansion to the 3S and other Mekong sub-basins.

The CNMC's Decision Support System (DSS), a central planning tool, requires urgent enhancement to

integrate climate change modules, improve hydromet data processing, and strengthen scenario modelling. Current technology gaps—outdated DSS, limited real-time monitoring, weak data integration, and capacity constraints—limit effective WEF-related decision-making.

The proposed CTCN technical assistance will:
• Upgrade the CNMC DSS for climate-resilient WEF planning;
• Strengthen hydromet and Earth Observation (EO) data integration for real-time decision-making; and
• Build institutional capacity through targeted training and development of sustainability and financing roadmaps.

This $250,000 request is scoped for the Se San Basin as a pilot, with outputs and methodologies designed for replication across Cambodia's river basins to strengthen long-term climate resilience and basin-wide WEF nexus management.

Background documents and other information relevant for the request:

The proposed technical assistance builds on existing national, regional, and basin-specific strategies, technical reports, and institutional commitments. Key background references include:

1. **Cambodia's Updated Nationally Determined Contribution (NDC 3.0) (2025)** – Adaptation Actions #62 and #63 emphasize climate-resilient water management systems and national flood warning capabilities, directly aligned with the proposed DSS upgrade and Se San Basin pilot.
2. **Cambodia Climate Change Strategic Plan (2024–2033)** – Prioritizes climate-resilient water governance, integration of climate information into decision-making, and enhancement of institutional and technical capacity, consistent with the Se San pilot's objectives.
3. **National Adaptation Plan (NAP)** – Identifies water resources, agriculture, and disaster risk reduction as priority sectors for adaptation, with explicit measures for river basin-level action.
4. **Technology Needs Assessment and Action Plan for Climate Change Adaptation (2013)** – Highlights critical technology gaps in hydromet monitoring, modeling, and DSS applications, which remain relevant and are directly addressed by the proposed TA.
5. **Cambodia National Water Sector Status Report (2015)** – Documents severe limitations in water resources monitoring and data integration, providing the baseline context for hydromet and DSS investments.
6. **CNMC Strategic Plan (2024–2028)** – Strategic Directions 4 and 5 emphasize environmental monitoring, climate assessment, and improved information systems, aligning fully with DSS upgrades and the Se San pilot.
7. **Mekong River Commission (MRC) Basin Development Strategy (2021–2030)** and **State of the Basin Report (2023)** – Prioritize integrated basin planning, WEF nexus management, and climate adaptation, with direct relevance to the Se San/3S Basin and transboundary collaboration.
8. **MIWRMP-3 Project Reports (2020–2023)** – Provide technical analysis, stakeholder engagement insights, and lessons learned for DSS-based basin planning in Cambodia's Mekong tributaries, including 3S.

These documents confirm the strong alignment of the proposed Se San pilot TA with national priorities, basin-level strategies, and regional cooperation commitments, ensuring technical, institutional, and policy coherence.

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 Mechanisms[2].

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

☐ 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:

The technical assistance will be monitored and evaluated according to CTCN procedures, ensuring that activities, outputs, and outcomes are delivered within scope, budget, and timeframe. CNMC will serve as the lead implementing agency for day-to-day monitoring, with MoE (NDE) providing oversight and alignment with national climate priorities, and MOWRAM supporting technical validation of hydromet and WEF data.

Monitoring Approach:

- **Baseline Assessment (Month 1):** Establish the initial status of CNMC DSS, hydromet systems, and institutional capacity in the Se San Basin;
- **Activity Tracking:** Monthly progress reviews with CNMC, MoE, and MOWRAM to verify deliverables and address implementation risks;
- **Mid-Term Review (Month 6):** Evaluate progress against technical milestones, stakeholder engagement, and gender participation targets;
- **Final Evaluation (Month 12):** Assess achievement of outputs, immediate outcomes, and readiness for scaling to the broader 3S Basin and national level; and

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

- **Quarterly Reporting:** Submit progress reports to CTCN with narrative, financial updates, and risk management actions.

Impact Tracking:
The impact of the technical assistance will be measured through quantitative and qualitative indicators:

- **Technical Impact:**
  - Operational upgraded DSS with climate and WEF modules; and
  - Hydromet and EO data integrated for Se San Basin modelling.
- **Institutional Impact:**
  - Increased capacity of CNMC, MOWRAM, MoE staff (target: at least 30% women participation in training); and
  - Stakeholder engagement in basin planning (target: 5 provinces, 3 workshops).
- **Policy and Planning Impact:**
  - Integration of Se San DSS outputs into CNMC Strategic Plan and basin development planning processes; and
  - Roadmap developed for expansion to the 3S Basin and other basins in Cambodia.

The monitoring process will ensure that lessons learned from the Se San Basin pilot are documented and incorporated into a scalability strategy, maximizing the long-term benefits of the $250,000 investment.

Signature:

NDE name: OU Chanthearith

Date: 25/08/2025

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.