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

Objective of the M&E Plan and Impact Statement:

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

Process for filling in the template:

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

Basic Information	
Title of response plan	**Updating and improving of existing hydrologic and hydraulic models and configuring a Flood Early Warnings System (FEWS) in Sudan**
Technical assistance reference number	**CTCN 23-001**
Country/ countries	**Sudan**
NDE focal point and organisation	**Ms. Huyam Ahmed Abdalla (General Directorate of Climate Change)**
Sector(s) addressed	**Water**
Technologies supported	**Flood Early Warnings System**
Implementation period and total duration	**16 February 2023 to 31 July 2024 (18 months)**
Total budget for implementation	**USD 249,951.00**
Designer of the response plan	UNEP-DHI
Implementer of response plan	**UNEP-DHI/DHI**

(A) Outputs and Activities as described in the Response Plan	(B) Indicator	(C) Expected results	(D) Method and frequency for data collection	(F) Comments
Output 1. Assessment of the existing FEWS system protocols and data identifying existing gaps and needs.				
Activity 1.1 – Project initiation and kick off meeting	Minutes of kick off meeting.	One (1) kick off meeting minutes, including description of action points and next steps.	• Kick off meeting with NDE and Ministry of Irrigation & Water Resources (MoIWR). Data collection during virtual meeting	
Activity 1.2 – Data collection and stakeholder consultation	Number of working group members from various stakeholder organisations	Up to 10 confirmed working group members	• Further Consultations with NDE and MOIWR and other stakeholders for data collection	
Activity 1.3 – Inception workshop	Number of inception workshop participants;	One (1) inception workshop with a maximum of 25 participants	• Inception workshop agenda • Inception workshop summary report with participants list • Data collection and discussion outcomes from the workshop	
Activity 1.4 – Review of the collected data	Inception Report	One (1) inception report	• Meetings with national stakeholders and consultants • Written report deliverable with comments from national stakeholders	Report will document key outcomes from data collection and stakeholder consultation, the inception workshop and the review of collected data for quality and gaps.
Activity 1.5 – Model and FEWS review	Enhanced FEWS Report	One (1) Enhanced FEWS Report	• Meetings with national stakeholders and consultants • Written report deliverable including any feedback from stakeholders	Report assessing the hydrologic and hydraulic components of the existing FEWS modelling framework and their performance
Activity 1.6 – Capacity needs assessment	In-person meeting Capacity needs assessment note	One (1) Capacity needs assessment note One (1) meeting	• Capacity needs assessment note document	The note will capture outcomes of the capacity needs assessment and will

		with system operators		contain the proposed training programme.
Output 2. Enhanced FEWS.				
Activity 2.1 – Expansion and improvement of the FEWS Components	Model calibration and validation report	One (1) Model calibration and validation Report	• Report including stakeholder and expert inputs, including ENTRO	
Activity 2.2 – Review and improvement of the overall performance of the system	Enhanced FEWS operationalized	Dissemination and reporting of flood early warning provided by the enhanced FEWS including for flood prone areas at the Dinder & Rahad rivers One (1) note with recommendations of priority future improvements of the system.	• Report including documented inputs and key issues/feedback from the testing period from operators, including ENTRO, as well as bi-monthly interactive emailing with operators.	
Activity 2.3 – Technical manual update	Updated technical manual	One (1) Updated technical manual	• Report including description of updates in accordance with system alterations and improvements carried out	
Output 3. Strengthened capacity and sustainability for uptake and effective use of the upgraded FEWS.				
Activity 3.1 – Production of training materials	Training materials	One (1) package of training materials	• Training package targeting for approximately twelve (12) local system operators, incorporating findings from capacity needs assessment report and stakeholder feedback, expert and stakeholder input	
Activity 3.2 – Training of government bodies and stakeholders for use of the system	Online and in person training sessions of selected system operators	One (1) five (5) day training event for a maximum of 12 participants	• Training session preparatory materials, confirmed participants list, agenda and summary note outlining key	

			outcomes.	
Activity 3.3 - Stakeholder workshop for FEWS product end users	FEWS product end user workshop and capacity enhancement report	A 1-day workshop with maximum of 25 local stakeholders 1 (one) capacity enhancement report)	• Preparatory workshop materials, including agenda and confirmed participants list. • Satisfaction survey results from training, workshop presentations and meeting minutes •Capacity enhancement report, including inputs and feedback from national stakeholders, and ENTRO	
Activity 3.4 – Preparation of a sustainability plan and closure report	Technical assistance management documentation	One (1) dossier of technical assistance management documentation	• Stakeholder workshop including participant lists, satisfaction survey results and meeting minutes	

Impact Statement	
Challenge	*The challenge involves:* • *Reviewing and improving the existing FEWS model with regards to newly available data such as land use change and expand the modelling framework to cover the Dinder and Rahad basins.* • *Validating the Weather Research and Forecasting (WRF) model from ENTRO, review and improve the overall performance of the FEWS.* • *Developing the dissemination component following the requirements of the Nile Water Department and the stakeholder consultation process.*
CTCN assistance	• *Enable Sudan to operate an innovative adaptation technology such as a FEWS to increase the resilience of communities, infrastructure, and economic sector investments in flood affected areas.* • *The enhancements to the existing technology will include an early warning component that will allow better preparation and increased response capacity by authorities and communities for upcoming floods, minimizing losses and damages*
Anticipated impact	• *Anticipated number of direct and indirect beneficiaries in the flood prone basins as a result of the TA* • *Anticipated increased economic, health, well-being, infrastructure and built environment, and ecosystems resilience to climate change impacts as a result of technical assistance.*
Anticipated co-benefits from the TA	*The technology will improve the knowledge for future adaptation measures and climate resilient flood management solutions within Sudan.* *The Flood Early Warning System (FEWS) enhanced so that it is appropriate for Sudanese authorities to increase the resilience of communities in Sudanese national sub-basins.* *The modelling framework is improved for forecasting purposes. This generates the opportunity for building on this output by carrying out very significant field data collection and repurposing the modelling framework for risk assessment purposes of the flood-prone areas.* *The preparedness and response work of disaster management authorities in Sudan will directly benefit from the enhanced FEWS and the Nile Water Department's increased operational capacity. The data gathered on the flood affected communities will allow national/local authorities to better prepare for flood hazards and the enhancements to the early warning facility will allow increased lead time to the agents responsible for response in case of a flood disaster.*
Gender aspects of the TA	*Floods disasters can affect a large part of households living in major cities of Sudan along the mainstream or tributaries of the Nile. Many of these households will include women and the CTCN assistance will provide improved information on flood disaster management targeting these vulnerable communities through FEWS. The Nile Water Department under the Ministry of Irrigation and Water Resources will ensure that women and men participate equitably in decision-making related to climate technology implementation as well as benefit equitably from technical assistance and project-related training. More specific gender equality will be recognized as an integral part of the stakeholder engagement and capacity building process, which are part*

	of Output 1 (Activity 1.3) and 3 (Activity 3.2 and 3.3).
Anticipated contribution to NDC	• *Building resilience against floods by reducing risks, preventing loss of lives and assets, and reducing poverty in flood prone areas in vulnerable States in Sudan* • *Build resilience in the health sector by reducing public health risks due to flooding (contamination of water supplies and increased cases of diarrhea and cholera)*
The narrative story	*Climate change presents additional stress for Sudanese people. It has exacerbated Sudan's social and economic challenges with the increasing occurrence of floods and droughts due to the growing inter-annual variability of precipitation in the Nile basin. These effects can already be seen today and have a massive impact on the water-food-energy-nexus. Extreme events have led to widespread property loss, damage to irrigation facilities and water services, and the spread of waterborne diseases.* *The population in the Nile River system is estimated at 31 million. Although the population at risk of flood is unknown, many major cities of Sudan (e.g., Khartoum, Wad Madeni, Singa, Rabak, and Ad Damar) are located along the mainstream or tributaries of the Nile, and the combined population of these cities alone amounts to more than 10 million, many of whom have suffered severely from flood disasters in the last decades.* *During the recent flood in 2020 the Nile reached its highest water level in 100 years, by more than 60 centimetres, and inflicted devastating damage to Sudan. The flood began in mid-July and marked the country's worst event in 30 years. According to the National Council for Civil Defence in Sudan, at least 121 people died, 54 were wounded, more than 98,000 houses collapsed, and more than 97,000 agricultural acres and numerous livestock were lost. Moreover, many buildings and facilities were adversely affected.* *The main barrier for climate change adaptation is a weak capacity for flood and drought preparedness as well as the lack of an up-to-date Flood Early Warning System (FEWS) covering the entire national territory of Sudan . The requested technical assistance focuses on strengthening the capacities for flood and drought preparedness and early warning system in Sudan using operational and innovative models.* *The proposed technical assistance will enhance the existing Flood Early Warning System (FEWS) setup by the Nile River basin regional entity the Eastern Nile Technical Regional Office (ENTRO) – comprising Egypt, Ethiopia, South Sudan, and Sudan – so that it is appropriate for Sudanese authorities' flood management operations in Sudanese national sub-basins.*
Contribution to SDGs	*SDG3: Ensure healthy lives and promote well-being for all at all ages* • *The technology proposed in this TA will help reduce risks to public health by reducing those risks caused by flash flooding (water supply contamination for example).* *SDG6: Ensure availability and sustainable management of water and sanitation for all* • *This TA proposing an enhanced Flood Early Warning System will improve the management of water in Sudan.* *SDG13: Take urgent action to combat climate change and its impacts.* • *This TA and the FEWS will help build the resilience and adaptive capacities of Sudan to flood extremes caused by climate change.*