

CREWS South Asia Project

Regional Workshop on Impact-Based Forecasting

30 September 2026



WORLD
METEOROLOGICAL
ORGANIZATION



UNDRR
UN Office for Disaster Risk Reduction



Introduction to SAHF



WORLD
METEOROLOGICAL
ORGANIZATION



UNDRR
UN Office for Disaster Risk Reduction



The South Asia Hydromet Forum (SAHF)

- Inaugurated in 2018 through the World Bank and World Meteorological Organization (WMO) with support from GFDRR and the European Union

Mission: Improve hydromet, early warning, and climate services in South Asia.

Focus: Strengthen National Meteorological and Hydrological Services (NMHSs) capacity and promote shared regional solutions for climate risks.

Goal: Foster joint action to enhance resilience, disaster preparedness, and climate-informed decision-making.

- Member countries: Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan, and Sri Lanka

The South Asia Hydromet Forum (SAHF)

2018

- SAHF was initiated through regional consultations to identify joint priorities in hydrometeorological modernization
- Conducted **SAHF I**

Identified priorities for collaboration in hydromet and service delivery modernization efforts

2019

- Conducted **SAHF II**

2021

- **SAHF Phase I** initiated

2023

- **MARCH:** Concluded Phase I – laid the solid foundation for regional engagement and capacity enhancement
- **APRIL:** Integrated into Climate Adaptation and Resilience (CARE) for South Asia Component 1 Project for Phase II

2025

- **July:** Concluded Phase II – laid the solid foundation for regional programs for all six thematic areas
- **August:** Activities for IBF WG started with support from WISER-AP
- **November:** Activities for OBS, NWP and Hydrology WG started with support from CREWS-SA and for CS WG with support from WISER-AP

The South Asia Hydromet Forum (SAHF)

Executive Council (Heads of NMHSs)

RIMES as Technical Secretariat & Technical Advisory Group (TAG)

SAHF WORKING GROUPS

Impact-Based Forecasting*

Numerical Weather Prediction

Observation Networks

Capacity Enhancement

Climate Services*

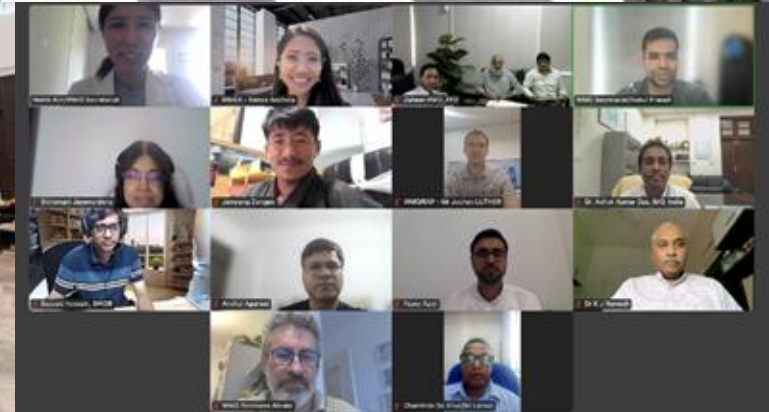
Hydrology

***Supported by UK Met Office through WISER Asia Pacific programme**

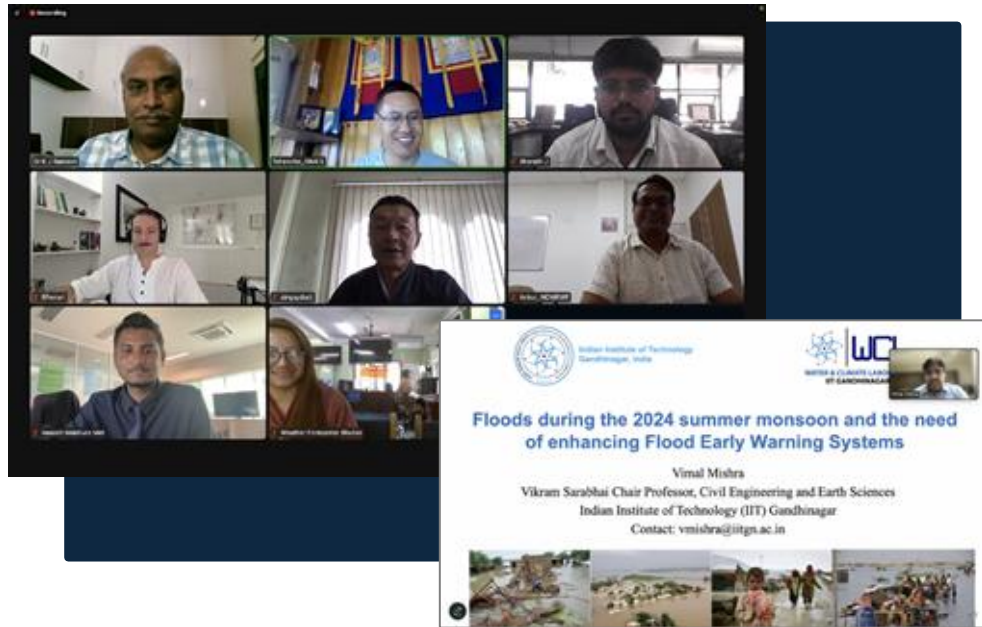
SAHF Key Initiatives

Convenes and facilitates:

- Annual Conferences
- Executive Council Meetings
- Working Group Meetings
- Weekly Forecasters Forum



SAHF Key Initiatives



Forecasters' Forum

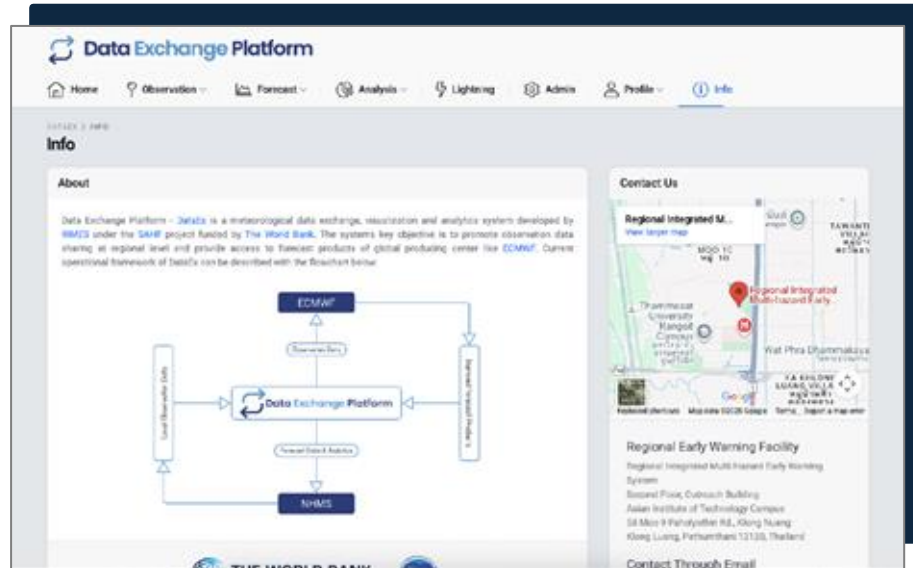
A weekly platform that facilitates knowledge sharing and collaboration among weather forecasters



Capacity Building Activities

Trainings and workshops focused on SAHF's priority capacity enhancement areas.

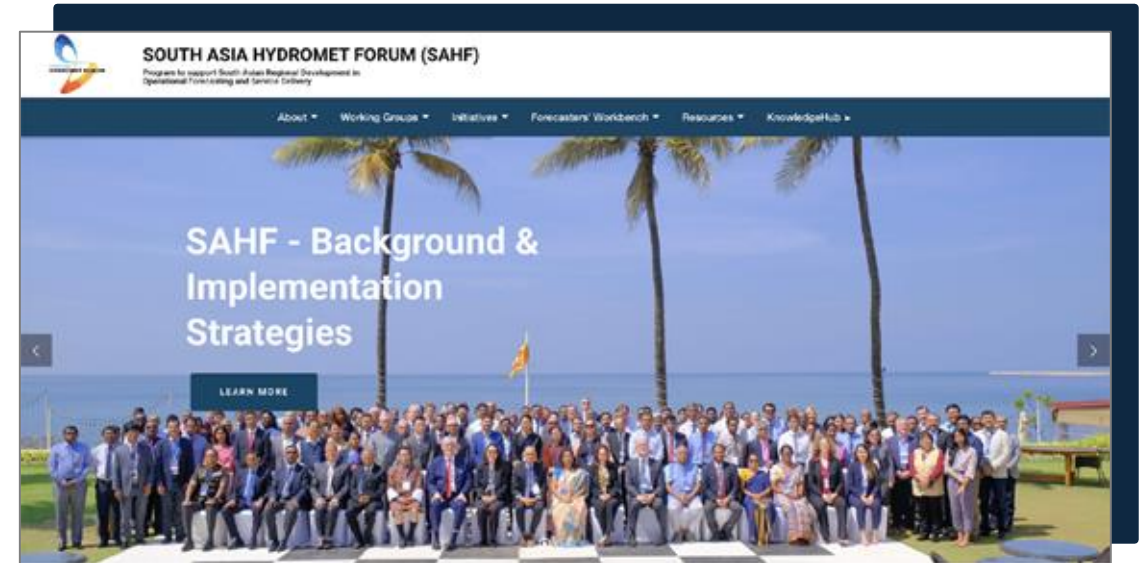
SAHF Key Initiatives



Data Exchange Platform

<https://dataex.rimes.int/>

A secure, real-time data exchange and analytics platform that enhances regional forecasting and collaboration among South Asian NMHSs



SAHF Knowledge Hub

<https://knowledgehub.sahf.info>

A centralized platform that provides learning resources and tools across SAHF's thematic areas

Overview of the CREWS South Asia Project

Mr Nakul Prasad

Project Officer, Hydrology and Water Resources Services (HWR)

Section, WMO



WORLD
METEOROLOGICAL
ORGANIZATION



UNDRR
UN Office for Disaster Risk Reduction



Project Snapshot

Budget – Timeline

USD 5,250,000

WMO – USD 5.07 M | UNDRR – USD 0.18 M

4 years (2025 – 2029)

Objective

Strengthen regional collaboration for improved hydrometeorological and early warning services in South Asia

Project components

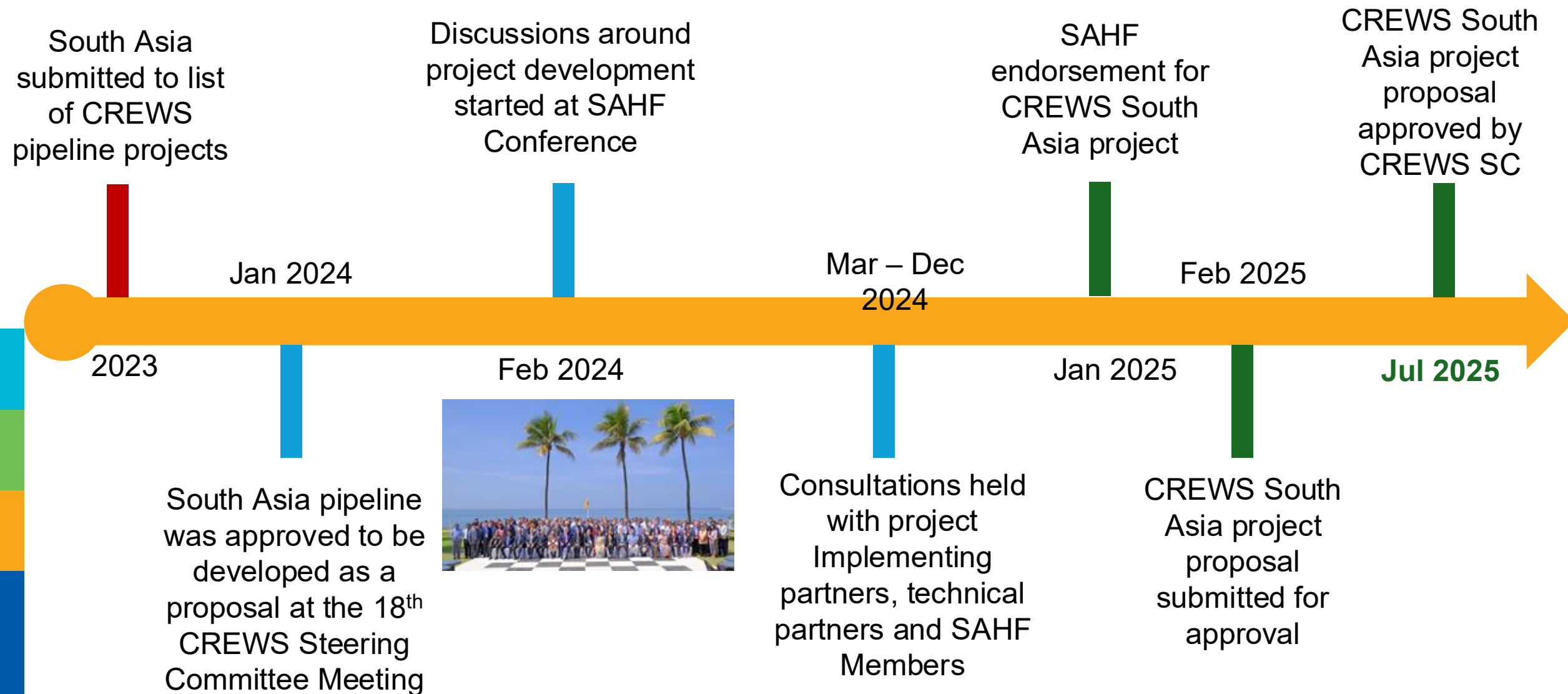
Component 1 – Strengthen regional collaboration to enhance hydrometeorological services

Component 2 – Improving the quality and efficiency of forecasting and early warning services

Component 3 – Ensuring that early warning programmes are driven by people-centered and gender responsive principles; and promoting private sector engagement

CREWS South Asia

Project Development Timeline



Project Workplan



WORLD
METEOROLOGICAL
ORGANIZATION



UNDRR
UN Office for Disaster Risk Reduction



Logframe

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Guidance	Responsible
Impact: National level hydrometeorological and early warning services improved through regional collaboration								
Strengthened resilience to climate shocks and loss and damage averted, minimized, and addressed through increased availability and improved access to forecasts and early warning service.	<i># of people living in LDCs and SIDS with access to/and receiving forecasts and early warning services developed or improved through CREWS support – disaggregated by gender</i> (CREWS MEAL Indicator)	SAHF Member countries (TBD)	TBD	Annual CREWS SA progress reports, TBD: EW4All dashboard	Direct surveys	End of the project	<i>Direct surveys with National Meteorological and Hydrological Services (NMHSs) and National Disaster Management Organizations (NDMOs) to confirm improvement of forecasts and warnings. Upon confirmation the assumption is that the benefit covers the entire population</i>	WMO
Outcome 1: Regional collaboration mechanisms for hydrometeorological services strengthened								
Regional collaboration mechanisms for hydrometeorological services strengthened	<i># of coordination mechanisms strengthened to enhance collaboration on forecasting and early warning among national and regional institutions</i> (CREWS MEAL Indicator)	0	1 (SAHF mechanism)	Annual CREWS SA progress reports and SAHF Executive Council Resolutions	Reports TBD: Survey with SAHF members	Annual	<i>Coordination mechanism refers to SAHF, while for strengthening we refer to the enhancement of collaboration and peer-to-peer knowledge exchange on forecasting and early warning service provision</i>	All

Logframe

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Guidance	Responsible
Output 1.1: SAHF strategic dialogues and high-level engagement deepened								
High-level strategic decisions are taken by the SAHF Executive Council (EC) to advance regional collaboration on hydrometeorological services	# of SAHF EC Resolutions endorsed	0	3	Signed SAHF EC resolutions	Report	Annual	Count the number of SAHF EC resolutions adopted. Assumption: one SAHF EC per year, three in total during the CREWS implementation period	WMO
Strategic engagement of the National Hydrological Services in the SAHF EC	# of national hydrological services represented in the SAHF EC	3 (due to combined hydrometeorological services in Nepal, Bhutan and Myanmar)	At least 5	Signed SAHF EC resolutions	Report	Annual	At least one SAHF EC conducted with increased NHS participation	WMO
SAHF-V Conference conducted	# of SAHF Conferences organized	4	5	SAHF-V conference report and CREWS SA progress reports	Report	Annual	SAHF-V conference organized with CREWS financing	WMO
WMO-SAHF Partner Coordination Mechanism established	WMO-SAHF Partner coordination mechanism in place	no	yes	Meeting minutes and CREWS SA progress reports	Report	Annual		WMO

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Guidance	Responsible
Output 1.2: Cooperation among forecasters of the SAHF region enhanced through the pooling of expertise								
Weekly SAHF Region Forecasters Fora (FF) continued and expanded to discuss weather and ocean situations, as well as monsoon conversations and extreme events (incl. Severe Weather Forecasting Programme (SWFP) & Flash Flood Guidance System (FFGS) products)	<i># of Forecasters Fora held</i>	153 as of Jan. 16, 2025	160 additional FF supported under CREWS SA	RIMES' logs on participation ; CREWS SA progress reports; Annual SAHF FF reports	Report	Annual	Count the number of FF held. Assumption: 40 FF event per annum.	WMO
Output 1.3: Hydrometeorological and early warning services enhanced through regional collaboration in SAHF countries								
Strategies and work plans developed for SAHF through thematic Working Groups (WGs), Communities of Practice (CoPs), and other regional mechanisms on key regional topics (such as Observation Network, Numerical Weather Prediction (NWP), Impact Based Forecasting (IBF), Decision Support System (DSS), Climate Services, Hydrology)	<i># of strategies, workplans, assessments, analyses and other mapping of needs, gaps priorities that inform investment requirements on forecasting & early warning systems</i> (CREWS MEAL Indicator)	0	3 (Hydro, CS, DSS)	CREWS SA progress reports, strategy/ work plan documents	Report	Annual	Count the number of strategies, workplan, assessments, etc. developed by the Working Groups	WMO
Outcome 2: Improved quality and efficiency of forecasting and early warning services								
Detection, observation, monitoring, analysis and forecasting of hazards that threaten the SAHF region	<i># of hazards monitoring, analysis and forecasting processes developed or improved</i>	0	2 (marine services & urban flooding)	CREWS SA progress reports, EW4All	Reports	Annual	For each priority hazard demonstrate progress of properties such as:	All

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Guidance	Responsible
are improved and sustained by the countries	(CREWS MEAL Indicator)			progress reports			Lead time, likelihood, impacts, actionable advice.	
Output 2.1: Co-development of the observation network and data exchange expanded								
Regional Basic Observation Network (RBON) high priority areas defined and RBON designed	<i># of RBON high priority areas identified</i> <i># of people trained and actively involved in the RBON design</i>	0 0	At least 1 At least 5	CREWS SA progress reports, RBON assessment report, RA-II RBON design workshop/ outcomes report	Report	Annual	RBON gap analysis conducted and RBON designed	WMO
Hydrometeorological data exchange platform for the SAHF region is strengthened through the addition of a quality control module to the DataEx tool	<i>Availability of a Quality Control (QC) module on DataEx</i>	No	Yes	CREWS SA progress reports / DataEx	Report / online tool	Annual	Assess the availability of Data Ex (yes or no)	WMO
Output 2.2: Forecasting capacities improved								
NMHSs in the region have enhanced capacities in developing, maintaining, and operating NWP capabilities, including interpretation, validation and data assimilation techniques through peer-to-peer exchange and regional trainings	<i># of additional forecasting and prediction products developed and/or accessed from WMO World Meteorological Centres (WMCs), Global Prediction Centers (GPCs), Regional Specialized Meteorological Centers (RSMCs) and NMHSs as a result of this project.</i>	0 developed/ accessed as a result of this project	2 developed /accessed as a result of this project	CREWS progress reports WMO Integrated Processing and Prediction System (WIPPS) database	Report & dashboard	Annual	This counts the number of products on forecasting and prediction developed with CREWS support or newly access to available from the WMO GPCs, RSMS, and NMHSs.	WMO

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Guidance	Responsible
	(CREWS MEAL Indicator) # of (unique) people trained disaggregated by gender, age, disability (as possible)	0	18					
Marine and coastal services in SAHF region are strengthened through improved wave and storm surge forecast	# of countries developing or accessing marine operational forecasting	0	4 (BD, MD, PK, SL)	CREWS SA progress reports	Report	Annual	This counts the number of countries in which marine forecasting has been strengthened with CREWS support.	WMO
Output 2.3: New forecasting techniques prototyped and EWS piloted for enhancing future Early Warning Systems in the region								
Urban flood EWS are piloted in SAHF region and a scaling up strategy developed to tackle the issue of urban floods	# of urban centres (cities) that have operational urban flood early warning systems established under the project	0	At least 1	CREWS SA progress reports	Warnings and alerts issued by the urban flood EWS	Annual	Count the number of cities with operational urban Flood EWS through CREWS support.	WMO
Prototype for weather forecasting in complex terrains with focus on mountain areas developed	Prototype for forecasting in complex terrain (mountains) available	no	yes	CREWS SA progress reports	Report	Annual	Assess the availability and accessibility of a prototype for weather forecasting in mountain areas.	WMO
Output 2.4: Last-mile connectivity to reach end users supported and mainstreamed								
Warnings and alerts are issued by relevant agencies using the Common Alerting	Number of countries that are CAP compliant	TBD	TBD	DRM Agencies & NMHSs	Direct survey	At the end of the project	This indicator will count the warnings prepared and issued by the	WMO

Logframe

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Guidance	Responsible
Protocol (CAP) standard and are accessible to all							country using the CAP format. Both conditions have to be met	
Outcome 3: People-centered and gender-responsive principles and private sector engagement mainstreamed in early warning programmes								
Early warning programmes are driven by people-centered, gender-responsive and disability inclusive principles and promote private sector engagement	<i># of climate and weather information products co-designed to users' needs by groups representing vulnerable segments of exposed populations</i> (CREWS MEAL Indicator)	0	1	CREWS SA progress reports	Number of products specifying which group was involved in co-design	Annual	This indicator counts the number of weather information products (e.g., weather apps, pushing warnings for cell phones, weather alert systems) designed taking in consideration <u>users</u> needs and with the participation of representatives of vulnerable segments of exposed populations.	All
Output 3.1: Early warning programmes driven by people-centered principles								
Virtual platform established to prototype solutions to improve DSSs and IBF	<i>Virtual platform established</i> <i># of countries sharing disaster data to the virtual platform through the disaster loss tracking</i>	No 0	Yes At least 1 country	CREWS SA progress reports	Report	Annual	Verify the availability of a virtual platform to prototype innovative solutions to improve DSS and IBF	WMO UNDRR

Logframe

Expected result	Indicators	Baseline	Target	Data sources	Data collection method	Frequency	Guidance	Responsible
	<i>system as per their data governance policy.</i>						Verify disaster data sharing	
Output 3.2: Private sector engaged to foster innovation and sustainability in the delivery of hydrometeorological and early warning services								
Public-private engagement in co-production of DSS to broaden the reach and increase the effectiveness of EWSs is piloted	<i># of agreements with private sector to co-finance or co-implement Early Warning System initiatives (CREWS MEAL indicator)</i>	0	1	CREWS SA progress reports	Report	Annual	Count the number of agreements with private sector firms signed to co-finance or co-implement EWS.	WMO
Pilot an innovative and low-cost technical solution to address a specific hydrometeorological challenge through an innovation call	<i># of applicants applying to the innovation call (disaggregated by private sector/research institutions/govt. agencies)</i>	0	1	Proposals/ Applications submitted	Pilot results (proof of concept) Report	Annual	Count the number of applicants who have submitted their proposals to the innovation call	WMO

Proposed workplan for 2026



Activity 1.1.1. Organize SAHF EC Meetings

EC Meeting

Activity 1.1.3. WMO-SAHF PCM established

PCM

Partner Initiatives mapping

Activity 1.2.1. Weekly Forecasters Forum

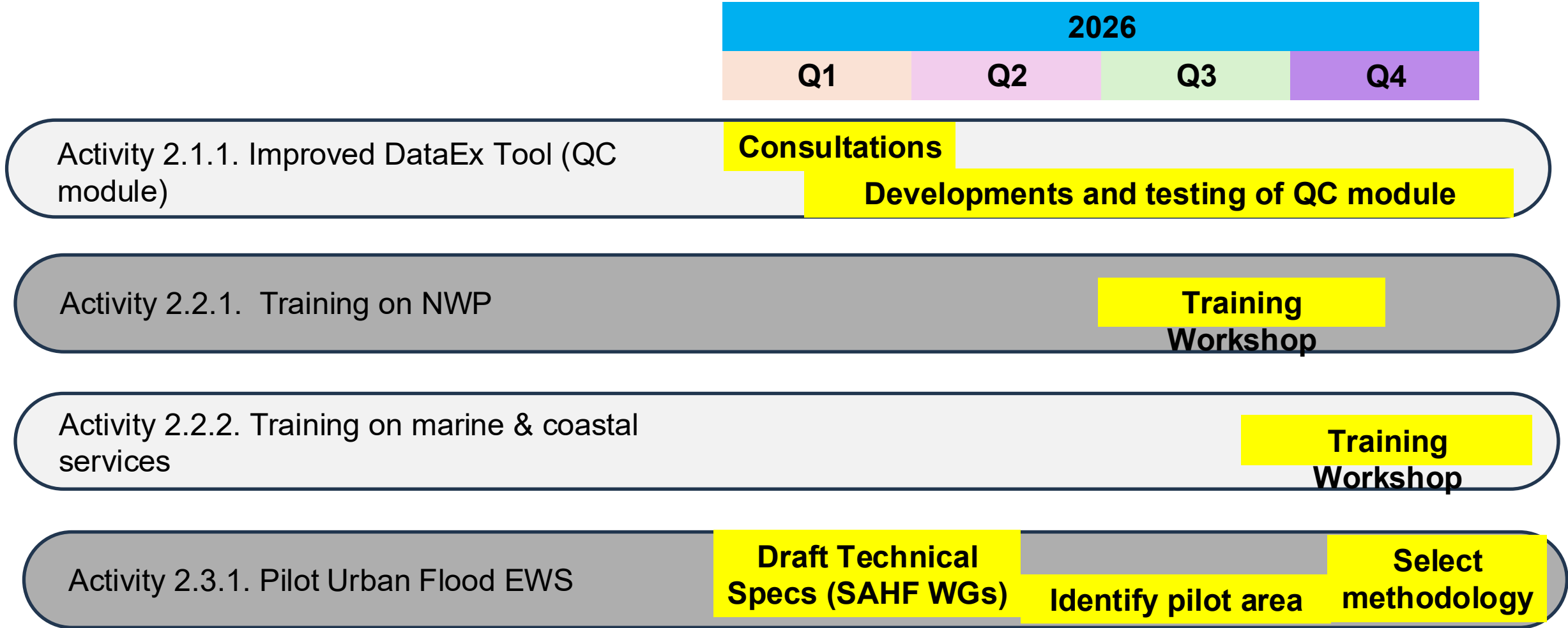
Weekly Forecasters Forum

Activity 1.3.1. SAHF WG Plans & Roadmaps

Consultations, Reviews, Assessments

Drafting of WG Plans and Roadmaps

Proposed workplan for 2026



Proposed workplan for 2026

2026			
Q1	Q2	Q3	Q4

Activity 2.3.2. ML assisted precipitation forecast development over complex topography

Data preparation for training and verification

Research to evidence value of ML model for different cases

Co-development of ML Ops pipeline

Activity 3.1.1. Establishment of virtual platform to prototype solutions to improve DSSs and IBF

Framework development

Consultations and system design

THANK YOU

