United Nations | Department of Economic and Social Affairs

unitar United Nations Institute for Training and Research

cifal Jeju

UNDRR UN Office for Disaster Risk Reduction

MCR 2030 Making Cities Resilient

UN environment programme

CTCN UN Climate Technology Centre & Network

Online Workshop

Strengthening Flood Early Warning in Sudan

Community-based preparedness using satellite telemetry, operational models & real-time flood forecasting

Sharone Molly

12 - 14 May 2026

14:30 - 18:00 Seoul, GMT+9
12:30 - 16:00 Bangkok, GMT+7
01:30 - 05:00 New York , GMT-5

Photo from : The Malaysian Reserve

Joint Certificate Programme

THE CHALLENGE

31M
People along Nile river system at risk

10M+
Urban residents in flood-prone cities

100yr
Highest Nile water level reached in 2020

98K
Houses collapsed in 2020 floods alone

Context

- Climate change has intensified inter-annual variability of Nile basin precipitation, worsening Sudan's flood and drought cycles.
- The 2020 flood (the worst in 30 years) caused 121 deaths, 54 injuries, collapse of 98,000 houses, and loss of 97,000+ agricultural acres.

The Gap

- Outdated FEWS not covering key flood-prone basins
- Weak institutional capacity for preparedness
- No real-time telemetry for water level monitoring
- Limited dissemination of warnings to communities

CTCN SOLUTION: ENHANCED FLOOD EARLY WARNING SYSTEM

Technology

- Enhanced EN-FFEWS model
- Satellite-based water telemetry
- Hydrodynamic modelling (MIKE)
- Real-time web dashboard (SudanFEWS)
- Automated email alert dissemination

Coverage Expanded

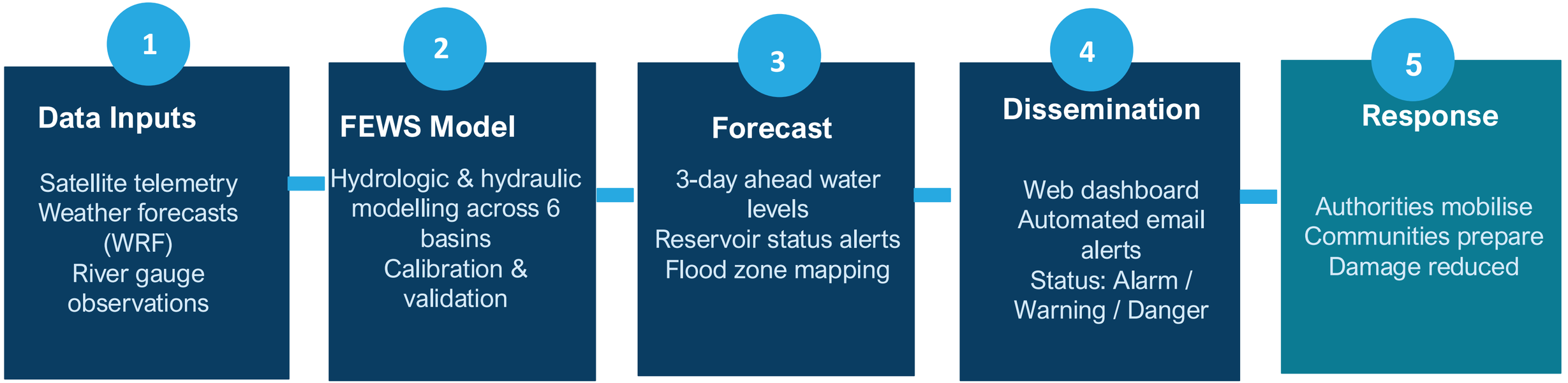
- White Nile & Blue Nile
- Main Nile to Dongola
- Atbara basin
- Dinder & Rahad basins
- Real-time reservoir monitoring

Capacity Built

- 4-day technical training (12 staff)
- End-user workshop (8 participants)
- Updated technical manual
- 7 institutions trained
- 100% participant satisfaction

Implementer: UNEP-DHI · NDE: Higher Council for Environment & Natural Resources, Sudan · Mar 2023 – Oct 2024

HOW THE SYSTEM WORKS



Sudan FEWS Dashboard: real-time overview of reservoir status, catchment rainfall, and river flow across monitored basins. Alerts are automatically disseminated by email to government authorities and disaster management agencies.

KEY RESULTS & IMPACT

23M

Anticipated beneficiaries across 6 flood-prone basins

34

Participants across 4 events; 47% women

7

Government & academic institutions trained

100%

Satisfaction among training participants (5-point scale)

6+

New basins added to forecasting coverage

2yr

Post-project maintenance support secured

NEXT STEPS & SCALE-UP POTENTIAL

2-Year Maintenance

UNEP-DHI maintaining and hosting the operational FEWS via cloud infrastructure, ensuring continuity beyond project close.

Model Expansion

Framework can be repurposed for flood risk assessment across additional basins, supporting future investment and spatial planning decisions.

AI Integration

AI-powered weather forecasting and climate modelling can enhance FEWS predictive accuracy in line with UNFCCC TM's AI4ClimateAction initiative.

Replicability

The EN-FFEWS model is transferable. Similar FEWS projects are applicable across LDCs and SIDS with shared river basin systems.

INCLUSION

Gender Mainstreaming

- 47% of workshop participants were women
- Equitable participation in decision-making on climate tech embedded in TA design
- Gender equality integrated into stakeholder engagement
- FEWS targets flood-vulnerable households, many headed by women in Nile-basin cities