



unesco

High-level Symposium on “Integrated Water Cycle Management in the post-COVID-19 era”
9th International Conference on Flood Management (ICFM9)
Tokyo, Feb 18th, 2023

Dr. Anil Mishra, Chief of the Hydrological Systems, Climate Change and Adaptation Section, UNESCO



The Global Risks
Report 2022

17th Edition

INSIGHT REPORT




The planet cannot wait “Extreme weather” and “climate action failure” are among the top five short term risks to the world, but the five most menacing long-term threats are all environmental. “Climate action failure”, “extreme weather” and “biodiversity loss” also rank as the three most potentially severe risks for the next decade.

“Identify the most severe risks on a global scale over the next 10 years”



Source: World Economic Forum Global Risks Perception Survey 2021-2022

Over 90 per cent are water-related, including drought, flood and tropical storms, with significant impact on societies and economies



Water-related disasters in 2021 resulted in death toll of 6,500 (of which 6,000 by flood and storm), affected people of over 99 million (of which 52.7 million by drought), and economic loss of 224 billion US Dollars worldwide. Having experienced COVID-19 and recurrent disasters, it is imperative to build back better towards quality-oriented society that is more resilient, sustainable, and inclusive.

The publication also refers to UNESCO's work undertaken in coordination with USACE's Institute for Water Resources (IWR) on **Climate Risk Informed Decision Analysis (CRIDA)**- methodology for adaptation, to mitigate water security stressors and natural disaster shocks given climate change and other future uncertainties. The CRIDA approach has been applied with partners for water and environmental security in **California, Zambia, Chile, Philippines, and Thailand**

2022
HELP Global Report
on Water and Disasters



IHP-IX “Science for a Water Secure World in a Changing Environment” (2022-2029)



Five priority areas:

- Scientific research and innovation
- **Water Education** in the Fourth Industrial Revolution including Sustainability
- Bridging the **data-knowledge gap**
- Integrated **water resources management** under conditions of global change
- Water Governance based on science for mitigation, **adaptation and resilience**

34 expected outputs

150 Key activities (draft implementation Plan)



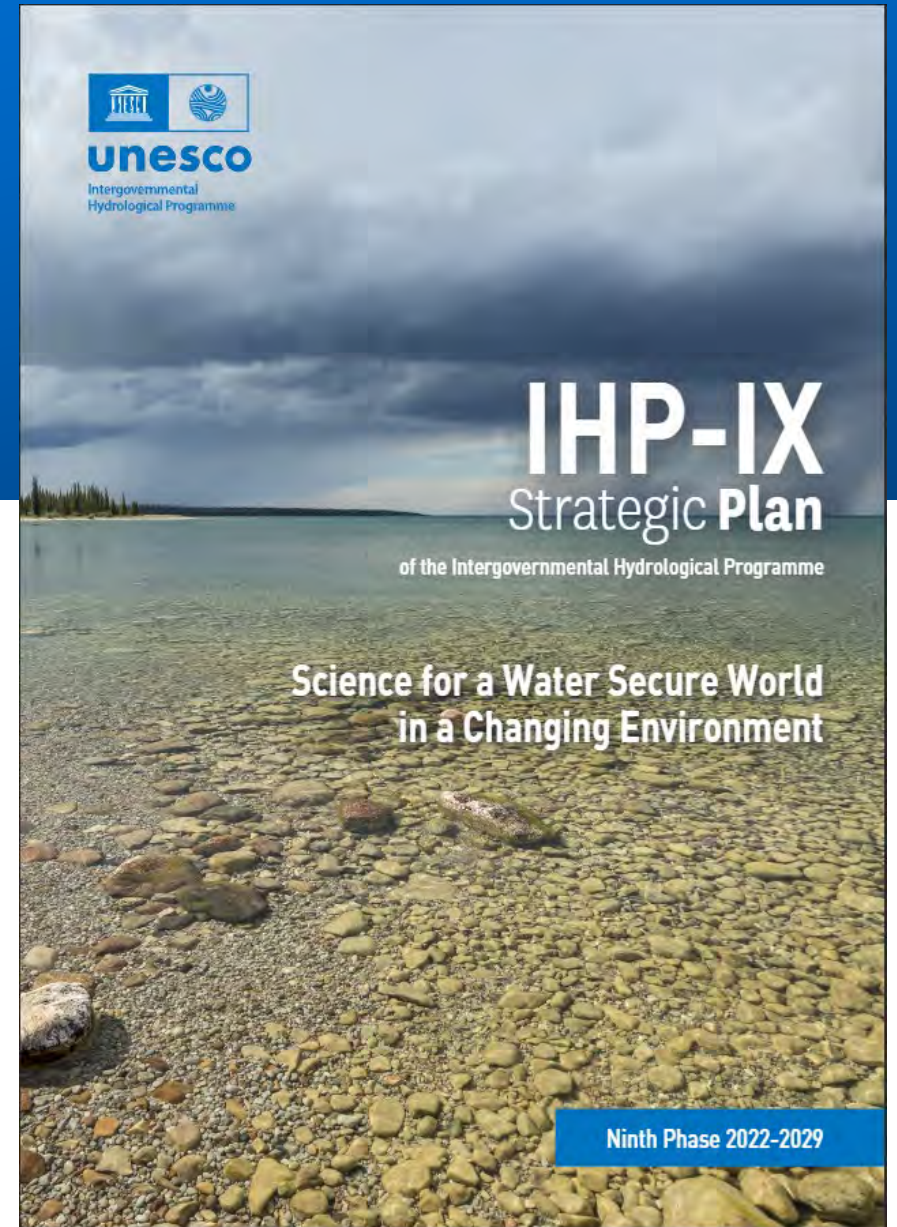
unesco

Priority Area. Scientific Research and innovation

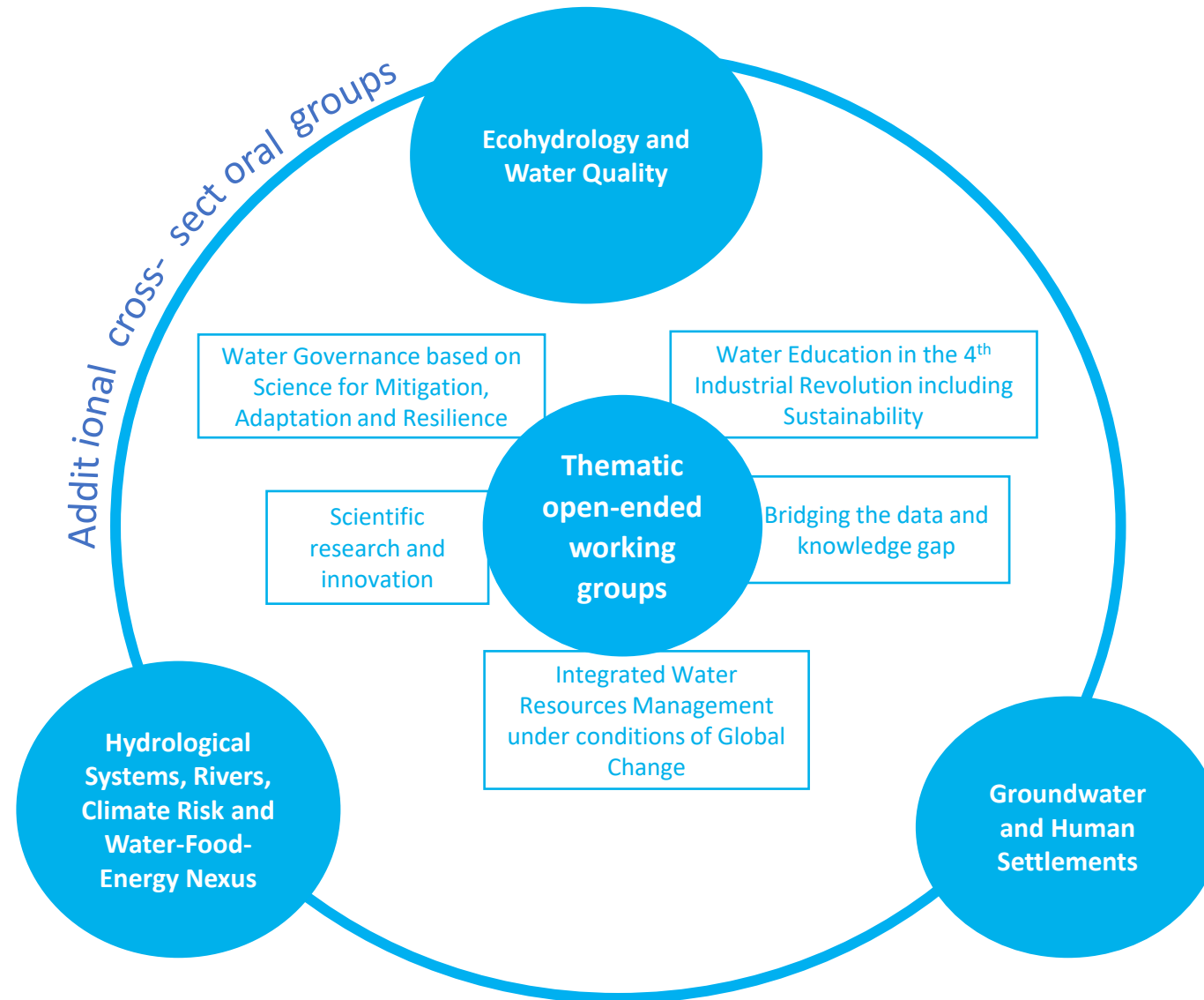
Output 1.6 Scientific knowledge, methodologies and tools in addressing water related disasters, such as flood and drought elaborated and/or enhanced towards timely forecasting

Key Activities

1. Research and knowledge generation on the scientific advances in addressing and timely forecasting of water related disasters
2. Science policy dialogue and capacity building on water management that considers wet and dry
3. Assessment of impact of past projects, review of lessons learned, and formulation and implementation of new projects at country level or/and basin level in different regions in addressing water related disasters and related research
4. Online synthesis systems to strengthen water related disaster resilience and sustainability to make maximum use of climate change projection and early warning and share good practices and success/failure stories
5. Synthesis and publications on knowledge, methodologies and tools on drought/floods



Intergovernmental Hydrological Programme (9th Phase)

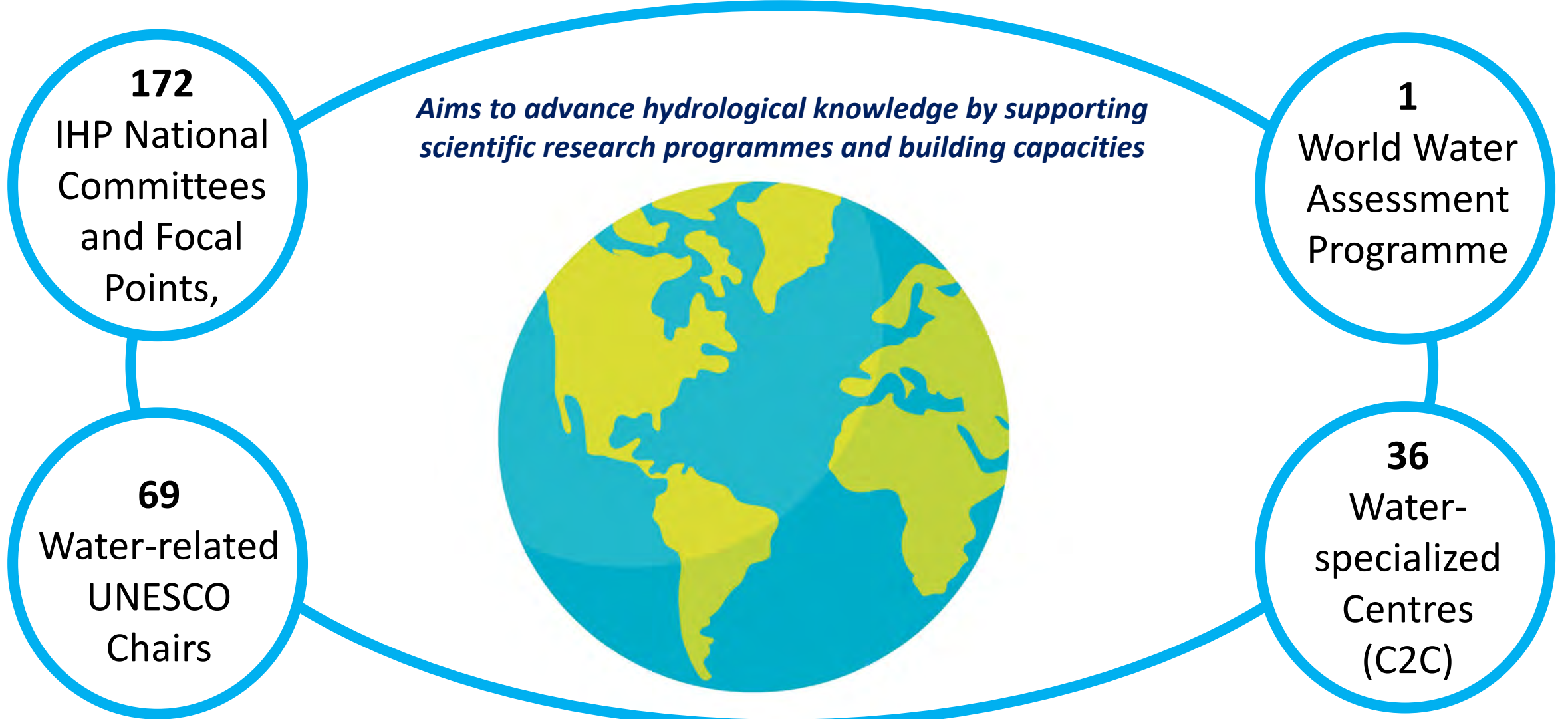


Thematic OEWG

1. Scientific Research and Innovation
2. Water Education in the Fourth Industrial Revolution including Sustainability
3. Bridging the data and knowledge gap
4. Integrated Water Resources Management under conditions of Global Change
5. Water Governance based on Science for Mitigation, Adaptation and Resilience

Additional cross-sectoral groups:

1. Hydrological Systems, Rivers, Climate Risk and Water-Food-Energy Nexus
2. Groundwater and Human Settlements
3. Ecohydrology and Water Quality;



The UNESCO Water Initiatives

As a programme at the global level, IHP covers a wide spectrum of initiatives:



Flow Regimes from International Experimental and Network Data

Hydrology for the Environment, Life and Policy

World's Large Rivers Initiative

G-WADI
Global Network on Water and Development Information in Arid Lands

IWRM
Integrated Water Resources Management

MAR
Managing Aquifer Recharge

WHYMAP
World Hydrogeological Map

UWMP
Urban Water Management Programme



Internationally Shared Aquifer Resources Management

GRAPHIC
Groundwater Resources Assessment under the Pressures of Humanity and Climate Change

IIWQ
International Initiative on Water Quality



From Potential Conflict to Cooperation Potential



Water Information Network System



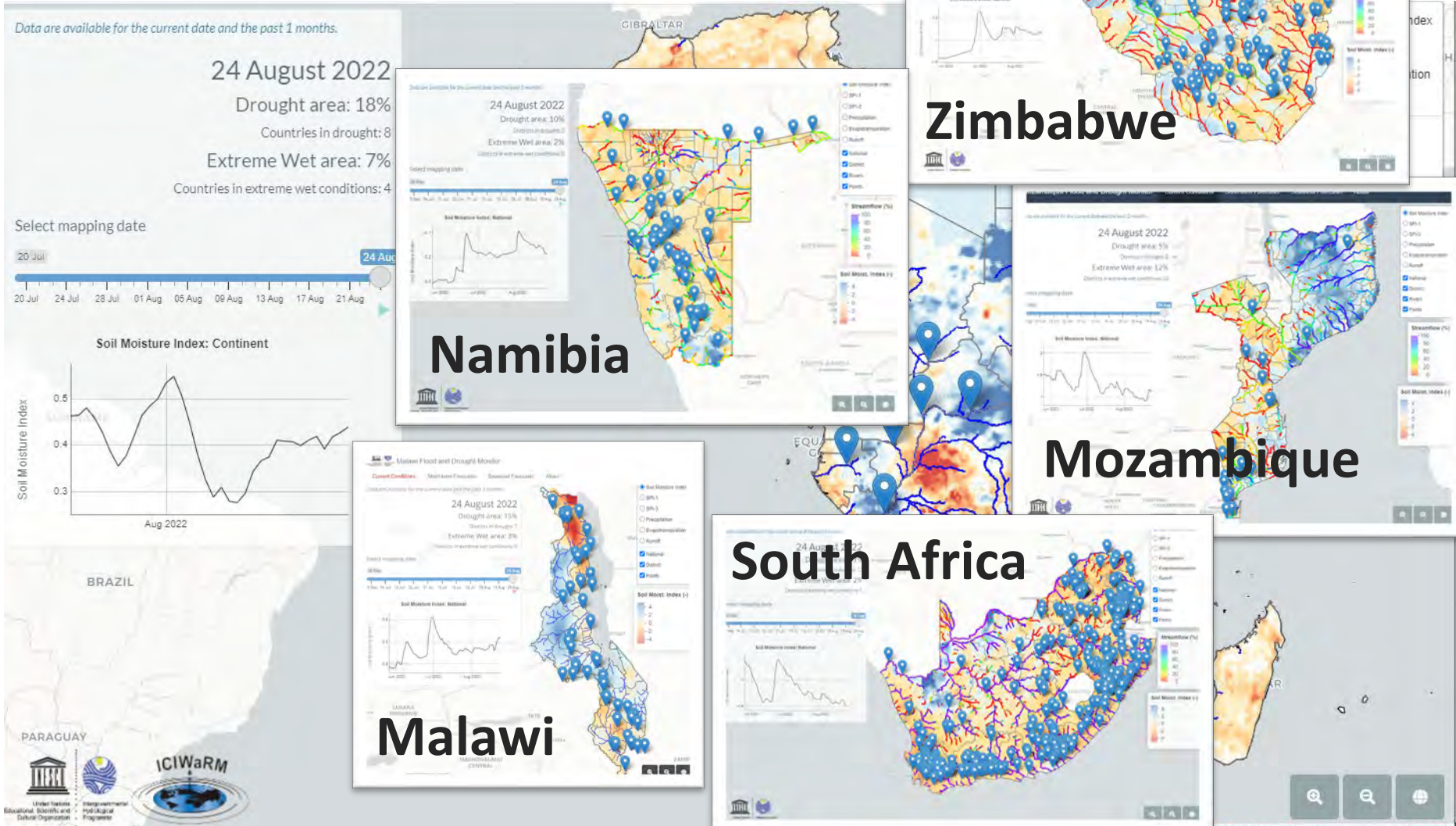
unesco

Flood and Drought Monitor Platforms

- **Continental: Africa**

- **National:**

- Zimbabwe
- Mozambique
- Malawi
- Namibia
- South Africa



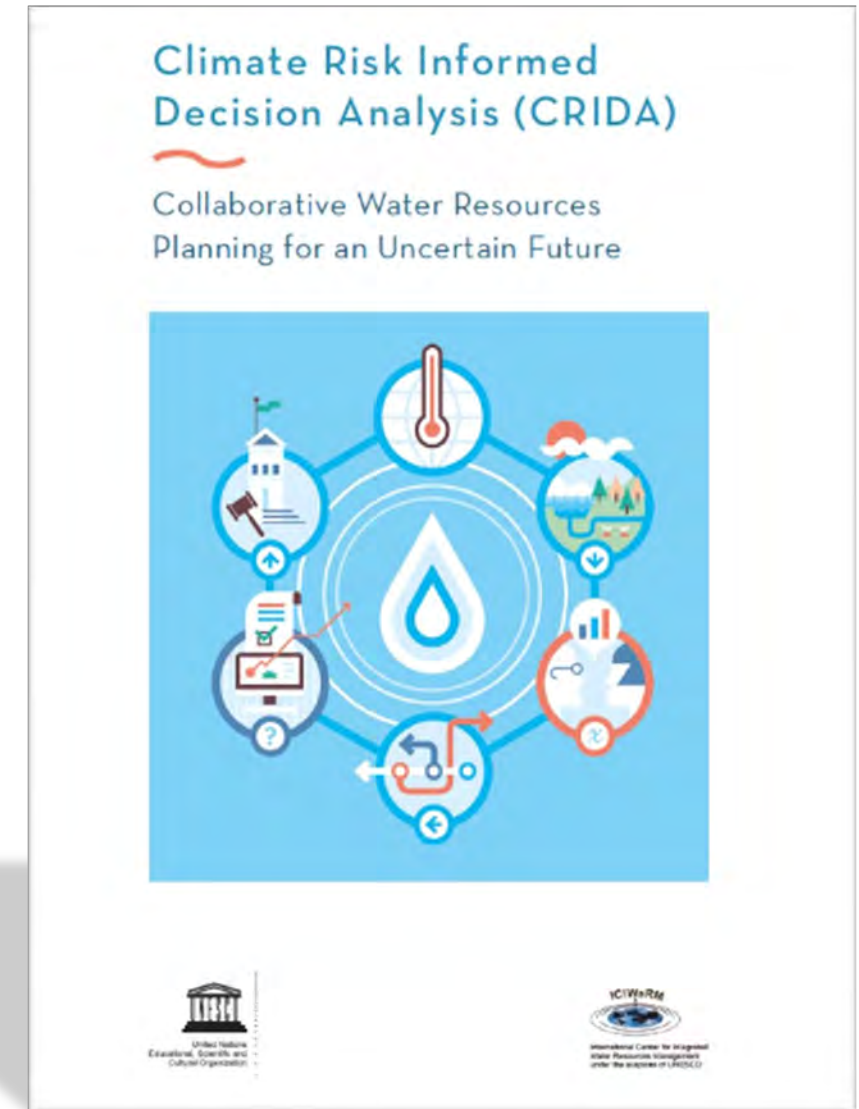
Accessible en: <https://en.unesco.org/disaster-risk-reduction/ews-water>

Climate-resilient water management approaches: Application towards Climate Action and 2030 Development Agenda

In 2020, UNESCO launched, with the support of the Government of Flanders, the project **Climate-resilient water management approaches: Application towards Climate Action and 2030 Development Agenda**, with two main objectives:

- 1) Compile CRIDA case studies from Africa, Asia, Latin America and Europe
- 2) Organize a Global Conference on climate-resilient water management approaches

Further, the project aimed at implementing activities within the framework of IHP-VIII (2014-2021) “Water security: responses to local, regional and global challenges”, and contribute to IHP-IX (2022-2029), “Science for a water secure world in a changing environment”.



Introduction to Climate Risk Informed Decision Analysis (CRIDA)

UNESCO

You are enrolled in this course

View Course



مقدمة في تحليل القرار المستنير بالمخاطر المناخية

UNESCO

You are enrolled in this course

View Course



Introduction à l'Analyse Décisionnelle basée sur le Risque Climatique (CRIDA)

UNESCO

You are enrolled in this course

View Course



Introduction to Remote Sensing for Catchment and Water Resource Management

ClimWaR

You are enrolled in this course

View Course



LAUNCH OF THE CLIMATE RISK INFORMED DECISION ANALYSIS (CRIDA) For Africa and the Arab Region

UNESCO PAVILION AT COP27
SHARM EL-SHEIKH INTERNATIONAL CONVENTION CENTER (SHICC),
SHARM EL SHEIKH, EGYPT

Register for online participation at:
<https://bit.ly/3snqr6f>

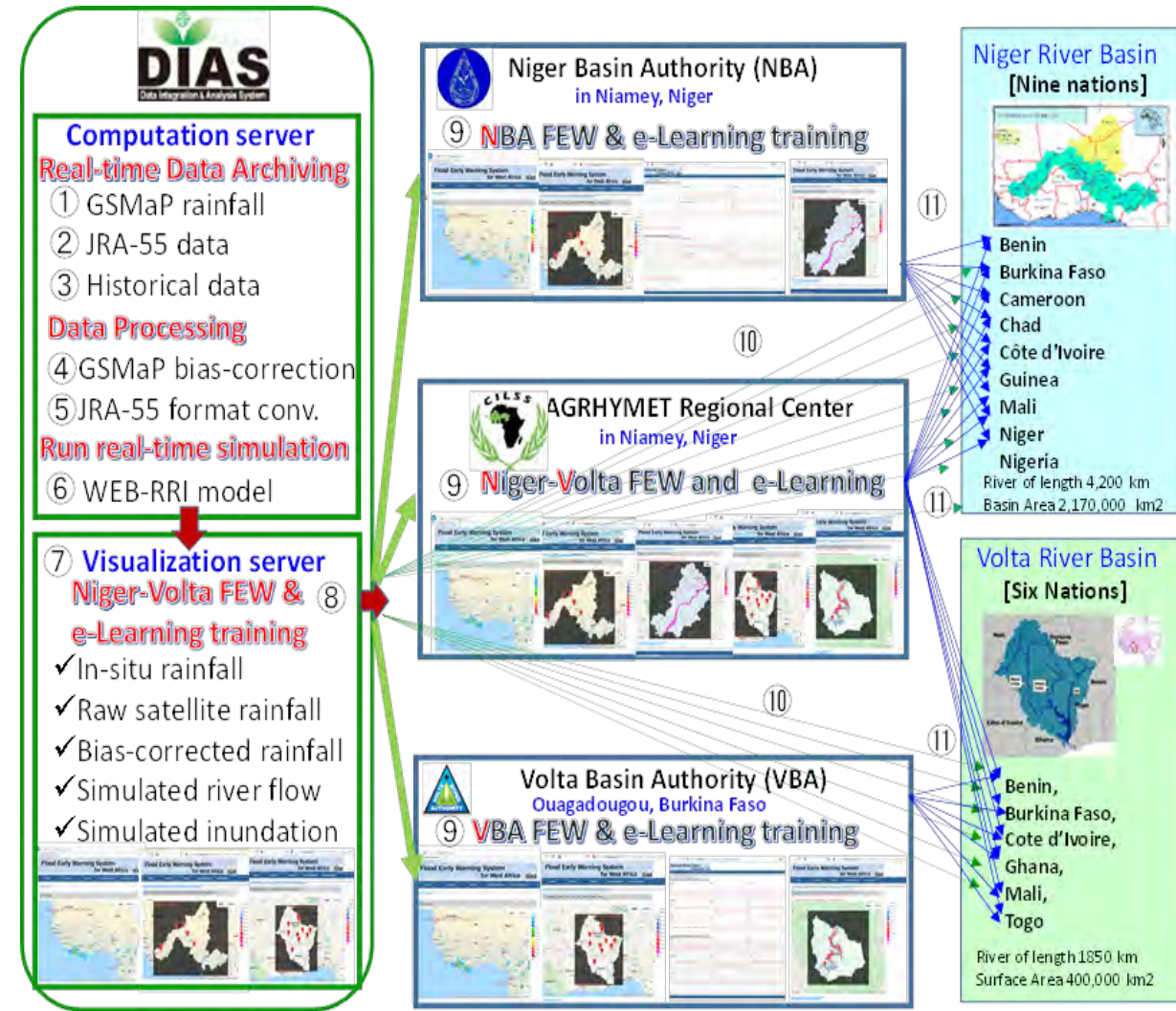
14 November 2022
15:45 - 16:45 (GMT+2)



IHP: monitoring and Early Warning Systems (EWS)

Regional Flood Early Warning System (FEWS) prototype for Niger and Volta River Basin on Data Integration and Analysis System (DIAS)

- AGRHYMET, Niger Basin Authority, Volta Basin Authority and 11 countries of the Niger and Volta River basins
- FEWS conducts several steps of data and information flow to develop flood-related information for AGRHYMET, NBA, VBA, and eleven countries of the Niger and Volta River basins



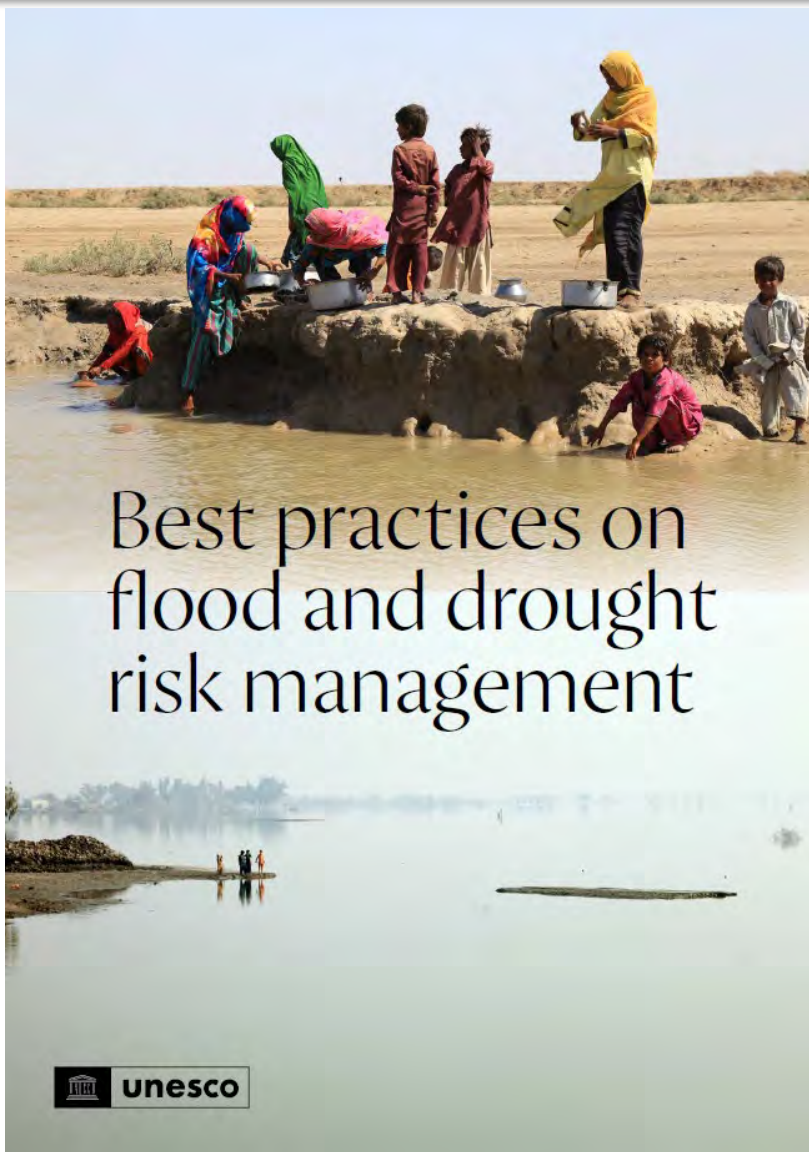


Table of Contents

Short summary	1
Foreword	5
1. Towards pro-active disaster risk management	6
2. Challenges for flood and drought risk management	12
3. Objectives and approach	14
4. Best practices for flood and drought risk management	15
4.1. Hazard and risk maps	15
4.2. Early warning systems and real-time monitors	19
4.3. Payment schemes for disaster recovery	21
4.4. Bottom-up and participatory approaches	23
5. Recommendations	29
6. Conclusions	31
7. References	32

A tool for **policy makers and practitioners** on how to address and understand **flood management**

Global Conference “Climate-resilient Water Management Approaches”, 26-28 October 2021



CLIMATE-RESILIENT WATER MANAGEMENT APPROACHES: APPLICATION TOWARDS CLIMATE ACTION AND 2030 AGENDA

A three-day global conference

26-28 October 2021

13:00-15:45 CEST daily



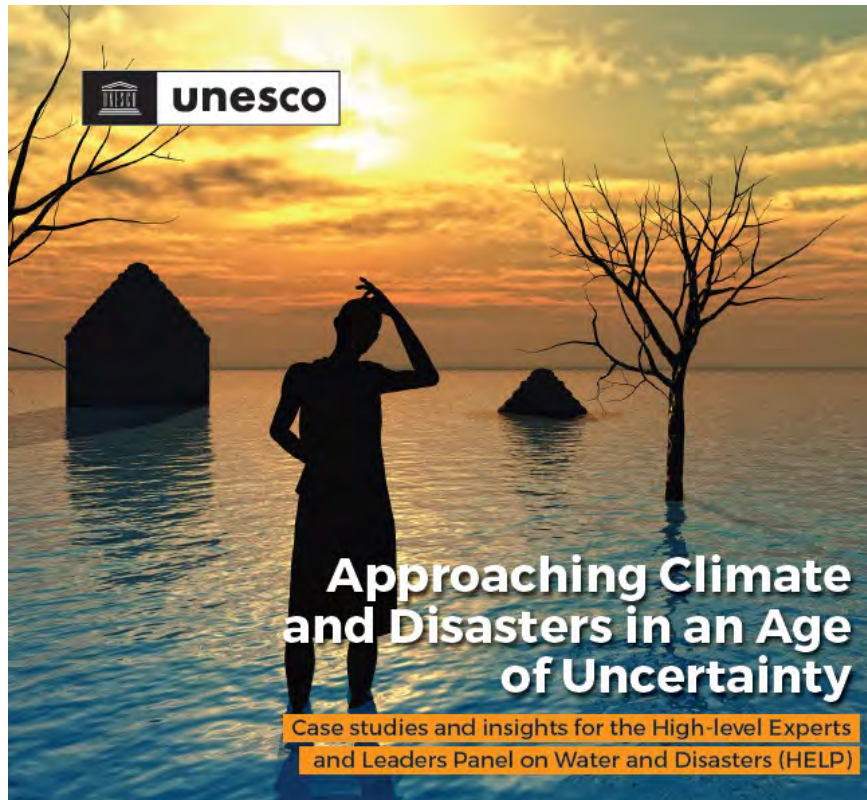
Objectives:

- Introduce participants to the technical and practical components of bottom-up approaches for climate adaptation;
- Share a global set of case studies;
- Identify the policies and institutional capacity needed to more widely incorporate these approaches within national climate programs, climate finance, and the private sector;
- Present the outcome of the conference to the policy community at COP-26;
- Contribute to formulating strategies for the 9th Phase of IHP (IHP-IX, 2022-2029).



unesco

Development of a compilation of case studies on bottom-up approaches



A new publication developed with AGWA, **Approaching Climate Disasters in an Age of Uncertainty – Case studies and insights for the High-level Experts and Leaders Panel on Water and Disasters (HELP)**

It aims to be a source to reimagine and readdress water management and climate risk assessment through locally defined policies and create a binding between these two subjects.

This publication follows the successful series of seven webinars, and the Global Conference held in 2021.

It features case studies from: *Thailand, Ecuador, Iran, India, Zimbabwe, Sri Lanka, Nepal, Zambia, Bolivia and Colombia*



unesco

Development of a compilation of case studies on bottom-up approaches

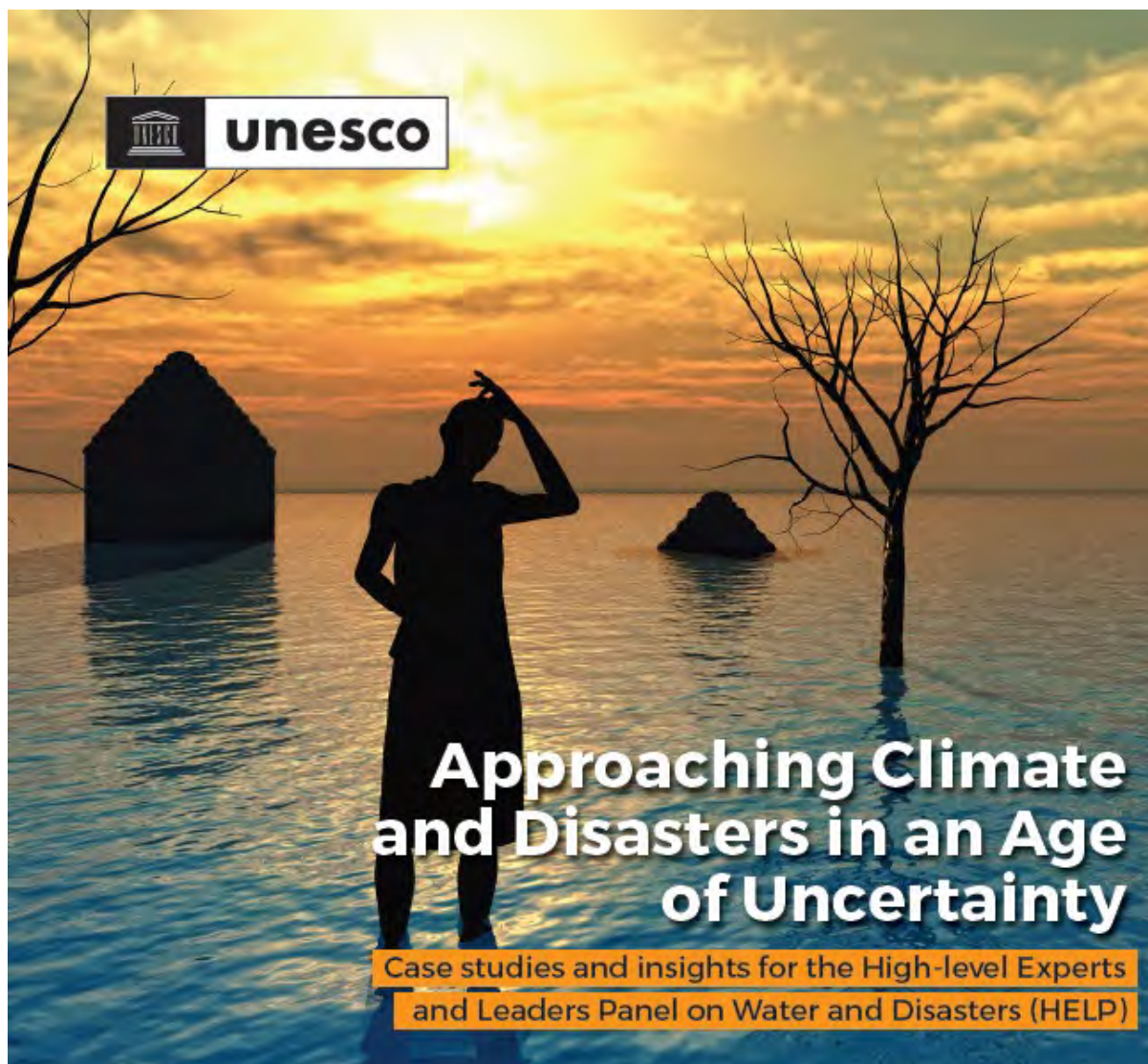


Table of Contents

List of Abbreviations/Acronyms	4
Foreword	5
Introduction	6
Disaster and Climate Policies: Alignment Through Water	8
Introduction to Global Disaster and Climate Policy Frameworks	8
Connecting National Response Options for Disasters and Climate	8
Devising, Measuring, and Reporting Across Frameworks	9
Who is Involved in National DRR and Climate Policies?	10
Creating Policy "Win-Wins": Water as the Great Connector	11
Policy-Practice Linkages: Turning Commitments into Action	12
Emerging Best Practices for Addressing Climate Uncertainty in Water Management	13
Case Studies: Bottom-up Approaches for Disaster Risk Management and Climate Change Adaptation in Action	16
Towards Climate-Resilient Urban Water Supply in Bangkok, Thailand	17
Implementing Nature-Based Solutions in Udon Thani, Thailand to Adapt to Climate Change and Rapid Urbanization	21
Using Nature-Based Solutions for Flood Resilience in Guayaquil, Ecuador	23
Developing an Indicator-based Sustainability Assessment Framework for River Basin Management in Iran	25
Co-producing Knowledge on Drought Resilience for India's Devnadi River Basin	28
Comprehensive Resilience Building in the Chimanimani and Chipinge Districts in Zimbabwe	30
Climate Change Adaptation for Municipal Water Supply in Colombo, Sri Lanka	33
Designing a Climate-Resilient Hydropower Sector in Nepal	37
Resilient Water and Energy Supply for Zambia's Capital in the Face of Drought	40
Climate Risk Assessment in Bolivia's Guadalquivir and Azero River Basins: A Bottom-up GIZ approach	43
Incorporating Climate Change into Colombia's Hydropower Planning	46
Moving Forward: Recommendations for the HELP	48
References	50



‘Game changer’ ideas on water and sustainability, centre-stage ahead of major water conference

Some 1,200 scientists, representatives of the private sector and civil society met at UN Headquarters in New York on October 24 and 25 and presented potentially game-changing ideas related to water and sustainability.



UN
2023 WATER
CONFERENCE

NEW YORK
22-24
MARCH
2023

High-Level Summary of Stakeholder Dialogue of the
Preparatory Meeting of the UN 2023 Water
Conference, 24-25 October 2022,

(Roundtable on Capacity Development)

“Open Science based validation mechanism
for resilience and sustainability in water”

A global science-based assessment contributes to ensuring the availability and accessibility of up-to-date assessments, addressing the inter-sectoral, systemic, integrative, and transdisciplinary nature of the complex and interconnected water challenges.

Open scientific consultations of the game-changer ISPWAS



Meeting with co-hosts and secretariat of the UN 2023 Water Conference
6 December 2022



1st Open Consultation during UN-WATER meeting,
6 December 2002



2nd Open Consultation Meeting, 19 January 2002

Finalizing the draft discussion paper

Since October, we have been improving the discussion paper of the **Intergovernmental Science-Policy Platform for Water Sustainability**



Game-Changer for the UN 2023 Water Conference

UNESCO's Intergovernmental Hydrological Programme (IHP) and Future Earth's Sustainable Water Future Programme (SWFP), in partnership with WMO, UNDP, UNEP, UNCDD, IAEA, IAHS, ISC and other organizations¹

INTERGOVERNMENTAL SCIENCE-POLICY PLATFORM FOR WATER SUSTAINABILITY

Background

The game-changing idea of the Intergovernmental Science-Policy Platform for Water Sustainability (INSPWAT) was developed and elaborated as a contribution to the upcoming UN 2023 Water Conference, to be held between the 22 and 24 of March 2023 at the United Nations Headquarters, in New York. The conference, co-hosted by the Republic of Tajikistan and the Kingdom of the Netherlands, is being organized under the resolutions of the UN General Assembly "Midterm Comprehensive review of the implementation of the International Decade for Action, 'Water for Sustainable Development', 2018-2028", adopted on 20 December 2018.

In preparation for the Water Conference, more than 1,200 scientists, representatives of Member States, the private sector, multilateral agencies and civil society met for a High-Level Stakeholder Dialogue as part of the Preparatory Meeting (New York, 24-25 October 2022) to identify potential game-changing ideas related to water and the 2030 Agenda for Sustainable Development. These ideas are to be developed into action plans for the Water Action Agenda, to support the ongoing discussions of the five Interactive Dialogues (ID) of the Water Conference.

The Intergovernmental Science-Policy Platform for Water Sustainability was one of the proposed game-changing ideas, led by UNESCO's Intergovernmental Hydrological Programme (UNESCO-IHP) and Future Earth's Sustainable Water Future Programme (SWFP), along with other UN agencies and the scientific community. The intergovernmental mechanism seeks to provide water solutions through a science-based global water assessment, tailored to address Member States' needs and validated by an intergovernmental body. It aims to be a game-changer in underpinning the sustainable management of water resources and supporting

¹ World Meteorological Organization (WMO); International Atomic Agency (IAEA); United Nations Development Programme (UNDP); United Nations Environment Programme (UNEP); United Nations Convention to Combat Desertification (UNCDD); International Association of Hydrological Sciences (IAHS) from the International Science Council (ISC); International Centre for Water Resources and Global Change (ICWRGC); European Regional Centre for Ecophysiology under the auspices of UNESCO (ERCE); Imperial College London (ICL); International Centre for Integrated Water Resources Management (ICWRM); Water Cycle Innovation (WCI); University of Arizona (UA); Griffith University (GU); ~~Johns~~ Johns University (JU); City University of New York (CUNY)

Assessment

- Assessment of MS needs implemented by national entities
- Science-based solutions, analytical tools, data, methods and approaches
- Water availability, use, quality, cross-sectorial, policy, society and environmental
- Identification of funding gaps and opportunities

Validation and support

- Intergovernmental validation mechanism
- High-level Policy Forum
- Support to SDG, NDCs and NAPs monitoring
- Cross-sectorial verification
 - Citizen engagement and indigenous knowledge

Capacity development

- Reduce N-S asymmetries
- Link with research centres

Synergies with IG mechanisms
(WWDR, IPCC, IPBES, UNDRR, CFS, GEO and others)

Interlinkages with other game-changers
(data and capacity development)

ISPWAS

- Science-based solution-oriented intergovernmentally validated report
- High-level Water Science Policy Dialogue Forum
- Special sectoral/thematic reports
- Interactive repository of tools

Building on existing reporting mechanisms



Bridging the gap between science, policy and decision-making to support effective resilience building

- 71 speakers for oral presentation
- More than 30 posters (to be confirmed)
- 3 potential science policy panel discussions
- 8 side events

CLIMATE RISK, VULNERABILITY AND RESILIENCE BUILDING

19-21 APRIL 2023

UNESCO HQ
PARIS, FRANCE



Thank you

Anil Mishra

**Chief of Hydrological Systems and Climate Change Adaptation (HCA) Section
UNESCO**

a.mishra@unesco.org



unesco

United Nations
Educational, Scientific
and Cultural Organization