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Climate-resilient water management approaches

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EU4 Climate -Adaptation planning and the mainstreaming of climate risks
into sectoral planning

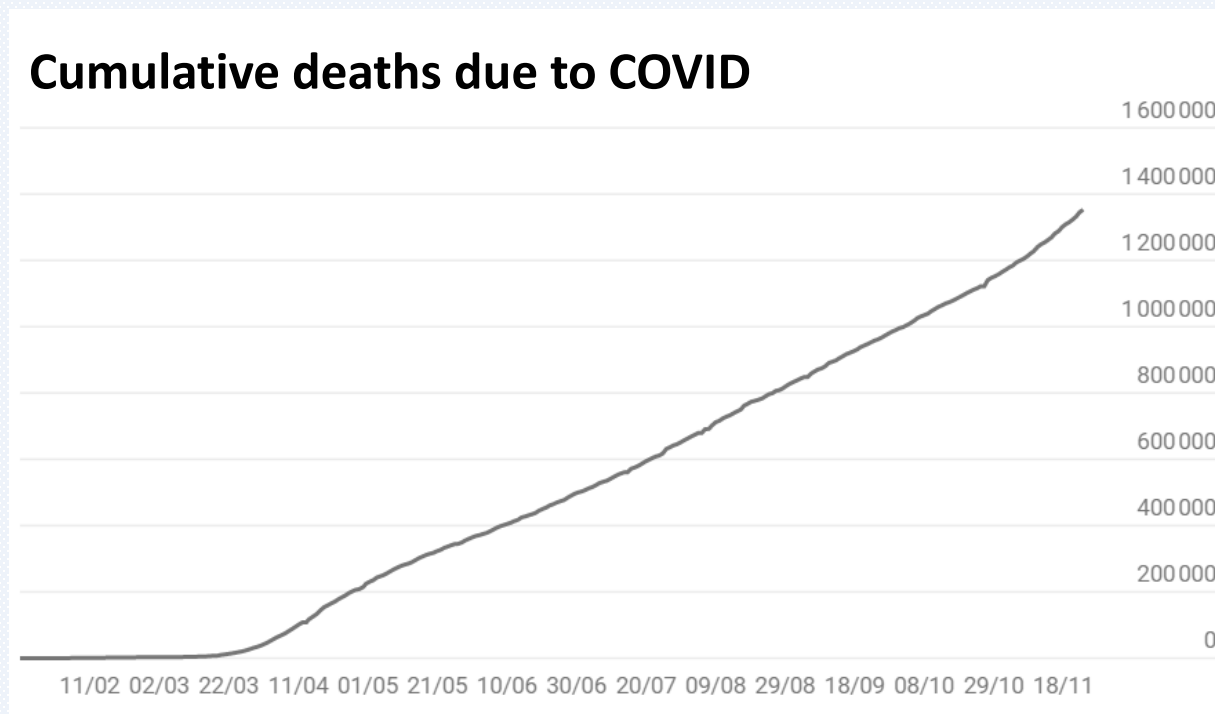
17 February 2021

Water and Climate change



The hydrological changes induced by climate change will add challenges to the sustainable management of water resources, which are already under severe pressure in many regions of the world, and amplifies water-related extremes such as flood and droughts

Climate change, a larger threat than COVID?!



Between 2030 and 2050, **climate change** is expected to cause approximately 250 000 additional deaths per year, from malnutrition, malaria, diarrhea and heat stress.

(Source: WHO)

There is no vaccine against climate change!



Top Risks

by likelihood

- 1 Extreme weather
- 2 Climate action failure
- 3 Human environmental damage
- 4 Infectious diseases
- 5 Biodiversity loss

Top Risks

by impact

- 1 Infectious diseases
- 2 Climate action failure
- 3 Weapons of mass destruction
- 4 Biodiversity loss
- 5 Natural resource crises

Climate change, a larger threat than COVID?!

DISASTERS DURING THE COVID-19 PANDEMIC

More than

100 disasters

Occurred during the first 6 months of the COVID-19 pandemic



93%
of these were triggered by climate- and weather-related hazards



Sources: EM-DAT, FAO/FEWS NET, Floodlist, ReliefWeb and IFRC GO

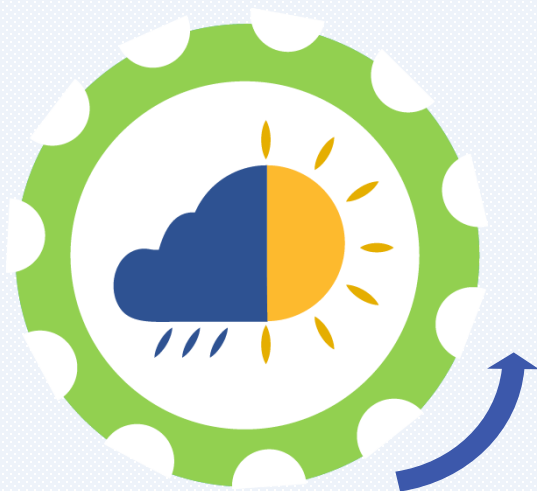
Notes: This is a snapshot only and includes disasters affecting over 1,000 people. This is preliminary data only based on what is already available in EM-DAT and IFRC GO, supplemented by additional sources. Final data for a given year is not generally available until the following year. High impact disasters are those with more than 250,000 people affected. WHO declared COVID-19 a pandemic on March 11, hence the first 6 months is calculated from March.

IHP-VIII Responses: 6 Themes, 3 Axes 2014-2021

Serving Member states for 55 years



IHP's mechanisms at work



IHP activities help Member States address water and climate-related hazards and enhance capacity building, data collection and dissemination, and tools development



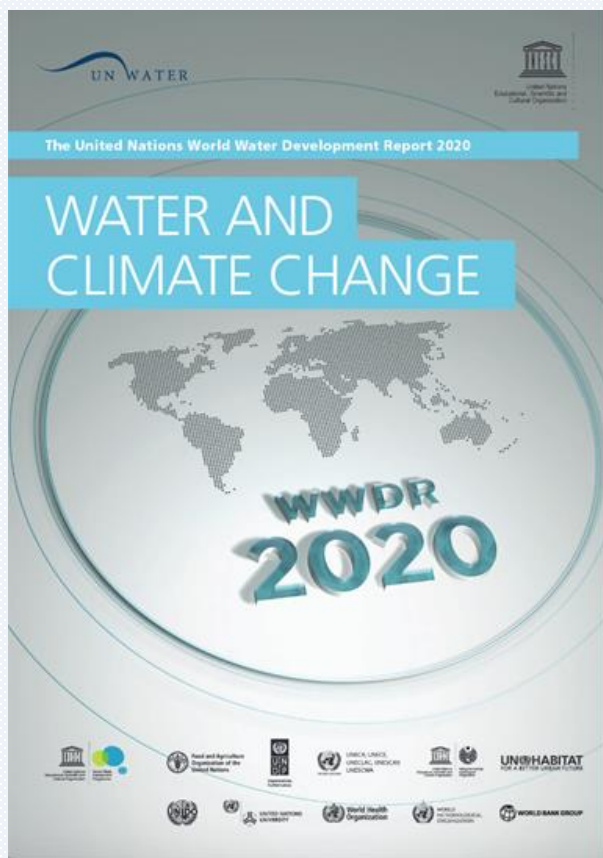
The IHP platform contributes to assessing and monitoring changes in water resources as a result of climate change and climate variability



It aims to raise awareness among policy-makers of links between water and climate change, and predictions and risks related to these changes

World Water Development Report

Figure 2.5 Water as a connector among the global commitments adopted in 2015



Source: UN-Water

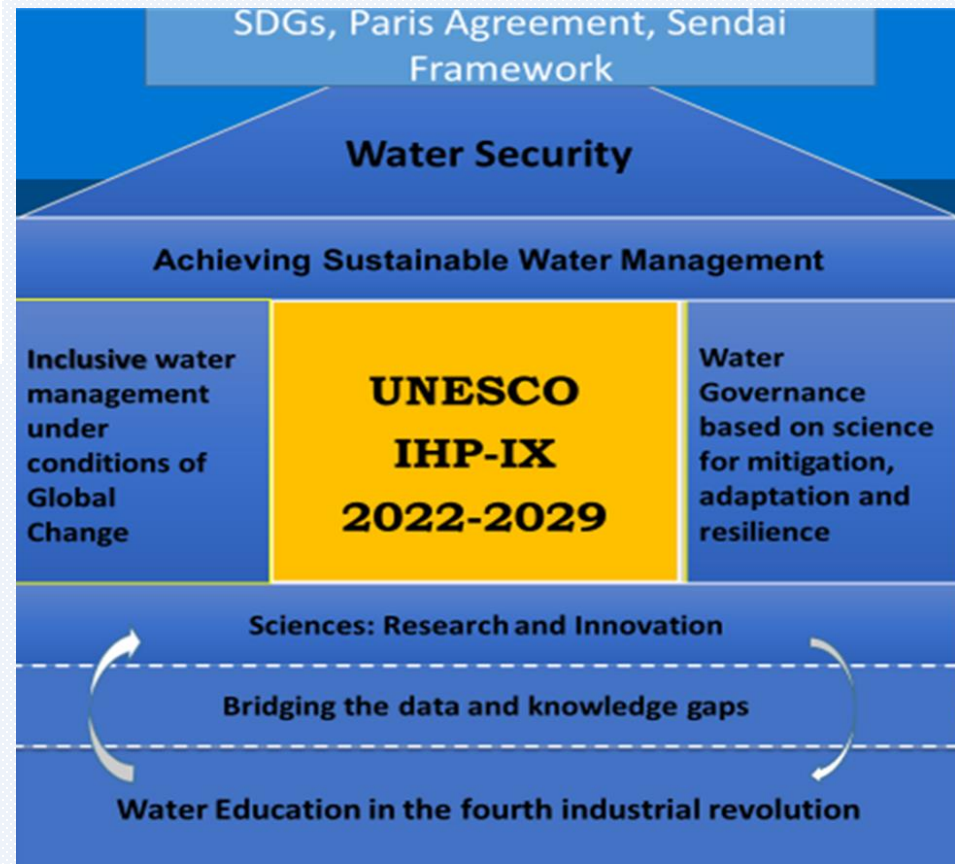
Intergovernmental Hydrological Programme (IHP)

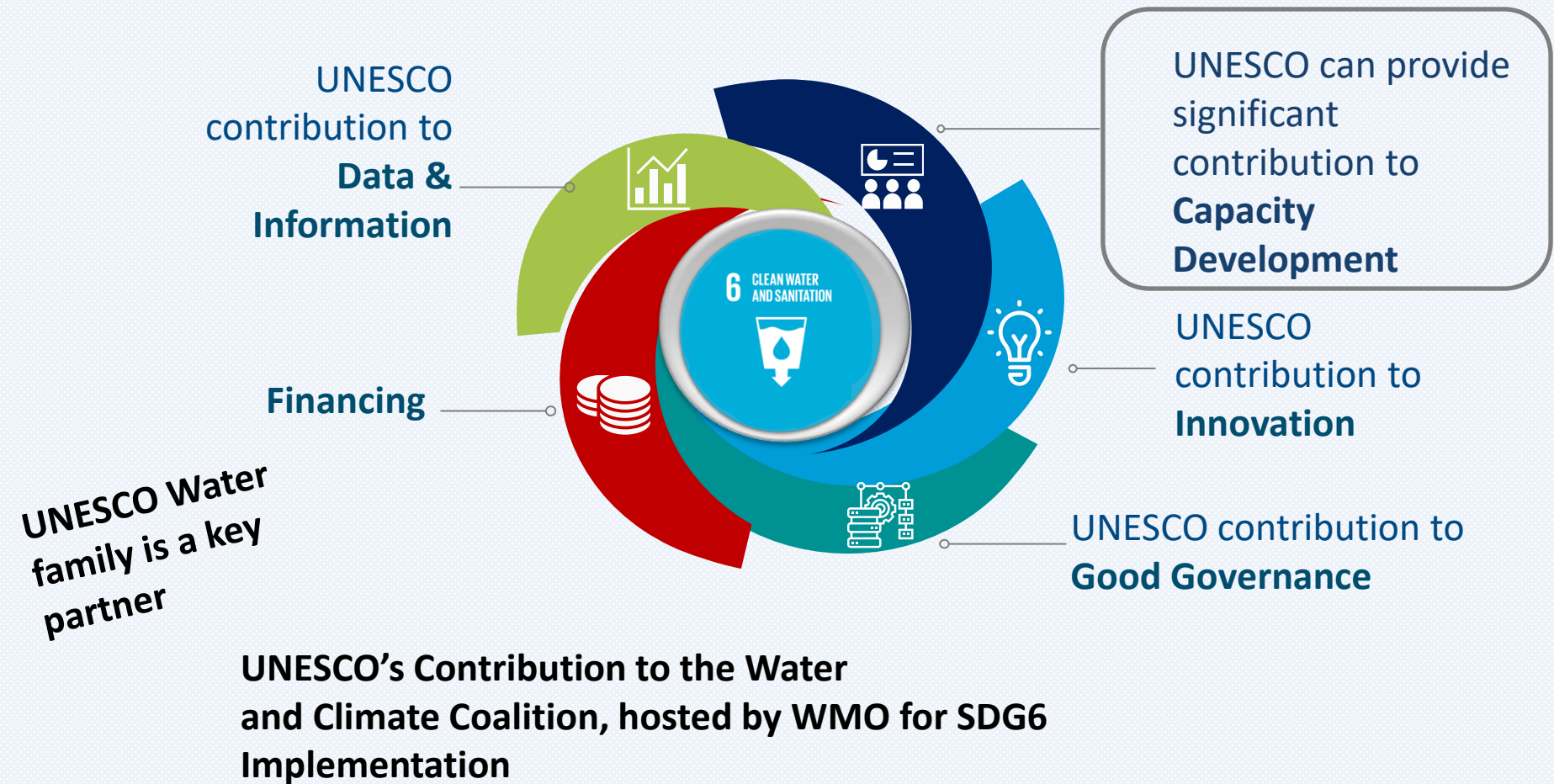
Serving Member states for 55 years



Water Security: Responses to local, regional and global challenges
IHP VIII 2014-2021

IHP IX 2022-2029



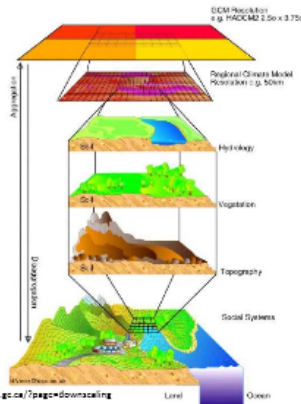


Climate Risk Informed Decision Analysis (CRIDA)

- CRIDA moves away from the 'one size fits all' approach, since adaptation to climate stress is a local process that requires the design of tailored solutions. In this way, CRIDA helps the water resources planner to navigate through an uncertain world toward imperfect but robust and socially acceptable solutions in line with local needs.

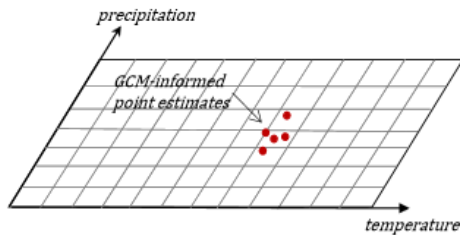
Traditional Approach

1. Downscale a few climate model projections



2. Generate a few water supply series

3. Determine whether system performance is acceptable for these series.

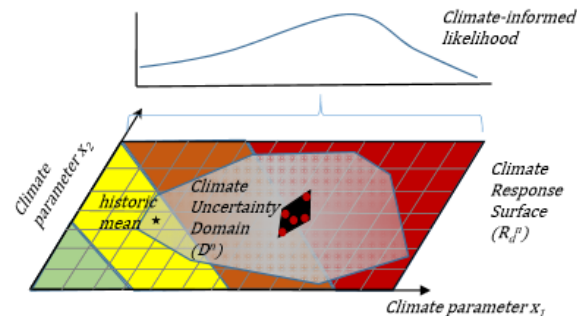


Expected Net Benefits (ENB)

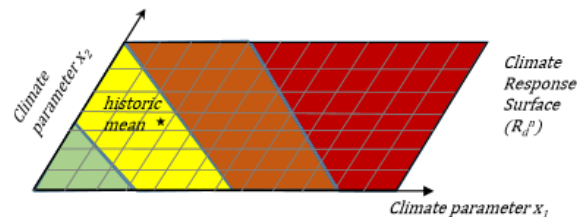
Decision Scaling

$$Risk\ to\ ENB = \sum_{s=1}^{\Omega} Impact \times Probability$$

3. Determine climate risks to project performance



2. Map climate domain onto vulnerability domain



1. Determine the vulnerability domain

Climate Risk Informed Decision Analysis (CRIDA)

Collaborative Water Resources Planning for an Uncertain Future



A new method - **Climate Risk Informed Decision Analysis (CRIDA)** - was developed in order to provide a solution to better integrate uncertainties linked to climate variabilities in water management.

CRIDA is a decision-centric approach for addressing water resources uncertainties during planning, design, and operations of water management infrastructure and aquatic systems.

Homepage: <https://en.unesco.org/crida>

Publication: <https://unesdoc.unesco.org/ark:/48223/pf0000265895>



Webinar Series: Climate-Resilient Water Management Approaches: Adaptation in an Age of Uncertainty

UNESCO's Intergovernmental Hydrological Programme (IHP), together with the Alliance for Global Water Adaptation (AGWA) and the International Center for Integrated Water Resources Management (ICIWaRM), is hosting a **series of webinars introducing the technical and practical components of bottom-up approaches**, spanning a range of topics and underscored by examples of real-world applications.

Webinars take place on a monthly basis in the lead up to a **global conference on Climate-Resilient Water Management Approaches**.

Homepage: <https://en.unesco.org/news/adaptation-age-uncertainty-tools-climate-resilient-water-management-approaches>




Online CRIDA training course

The lectures in this online course introduce the learner to the Climate Risk Informed Decision Analysis (CRIDA), a collaborative approach to address an uncertain future. The course is comprised of 12 modules of 1 hour each, which include **readings, video lectures, knowledge checks and assignments**.

Hosted at **UNESCO Open Learning Platform**: <http://openlearning.unesco.org/>

See **introductory video** at:

<https://www.youtube.com/watch?v=kAjM9S1GtRg&feature=youtu.be>

 **UNESCO**


CRIDA: CRIDA0001
Introduction to Climate Risk Informed Decision Analysis (CRIDA)

REGISTER SIGN IN ENGLISH ▼

Introduction to Climate Risk Informed Decision Analysis (CRIDA)

CRIDA

Enroll in CRIDA0001

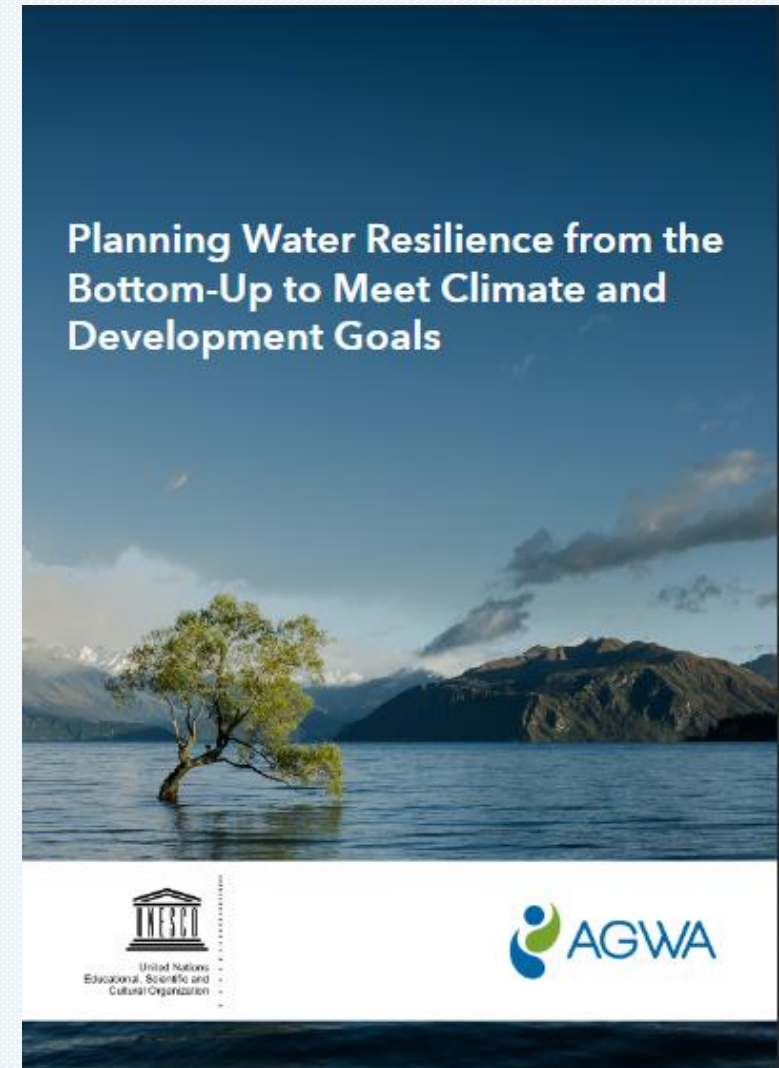


Planning water resilience from the bottom-up to meet climate and development goals

Policy brief on climate-resilient water management approaches (UNESCO & AGWA, 2021)

How to address climate as a risk (or opportunity)?

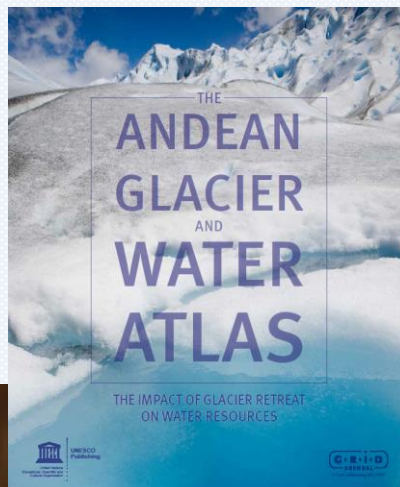
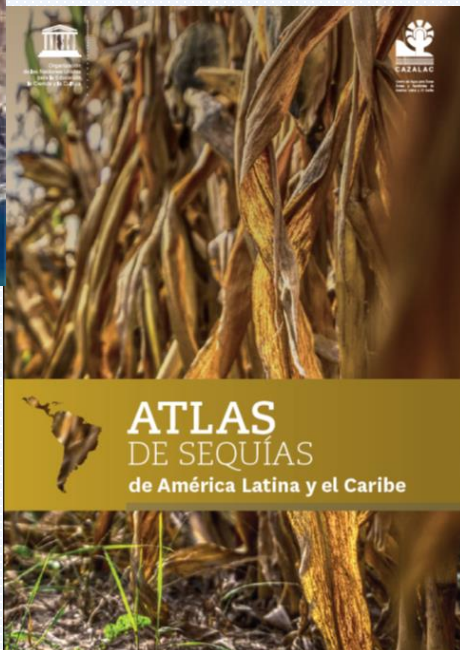
Bottom-up approaches confront climate and non-climatic uncertainties through a process where stakeholder-defined measures of success form the basis of risk evaluation. This **localized, context-specific** philosophy is essential for finding **more comprehensive policy responses** and ensuring **long-term community support**.





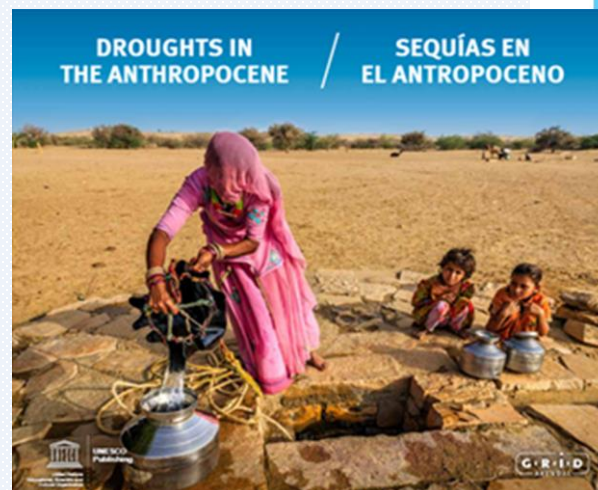
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UNESCO provides a key a platform to develop global knowledge base on climate- human interconnections particularly related to water resources.



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Strategies to adapt to increasing droughts in the Limari Basin, Chile

An application of the Climate Risk Informed Decision Analysis (CRIDA) approach



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Step 1: The Decision Context



Develop Problem Statement



Identify Key External Drivers



Build a System Model



Identify Key Performance Metrics (KPM)



Specify Critical Thresholds for KPMs

Step 2: Bottom-up Vulnerability Assessment



Conduct Climate Stress Test

Generate system response surface
Generate future climate projections



Assess Future Risk dimension for Level of Concern (LOC) analysis



Assess Analytical Uncertainty dimension for LOC Analysis



Determine LOC quadrant based on Future Risk and Analytical Uncertainty categorization

Step 3: Formulate Alternative Plans



Determine general strategic approach based on LOC quadrant



Compile Adaptation Action Library



Evaluate Adaptation Actions

Qualitative Assessment

Quantitative Assessment



Generate Adaptation Pathways

Time-based adaptation pathways per scenario

Step 4: Overview of Approach



Identify appropriate comparison and selection criteria based on LOC quadrant



Select tool to complete economic evaluation



Complete economic evaluation of adaptation pathways

Itemize and quantify pathway costs and benefits

Determine pathways with largest net benefit

Determine “clear winner” or compare incremental costs



Summarize outcome of economic evaluation

Step 5: Institutionalizing Decisions



Identify appropriate institutional and financing requirements



Select methodology for assessing institutional, socio-cultural (ISC) context



Assess ISC context, summarize key considerations for implementation of pathways/measures, generate pathway scorecard



Develop implementation plan for adaptation actions, including monitoring and evaluation plans

Global conference on climate-resilient water management approaches: application towards climate action and 2030 development agenda

Dates: 2-4 November 2021

Location: UNESCO Headquarters, Paris, France

Organizing partners: UNESCO's Intergovernmental Hydrological Programme (UNESCO-IHP), Alliance for Global Water Adaptation (AGWA), International Center for Integrated Water Resources Management (ICIWaRM)



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