

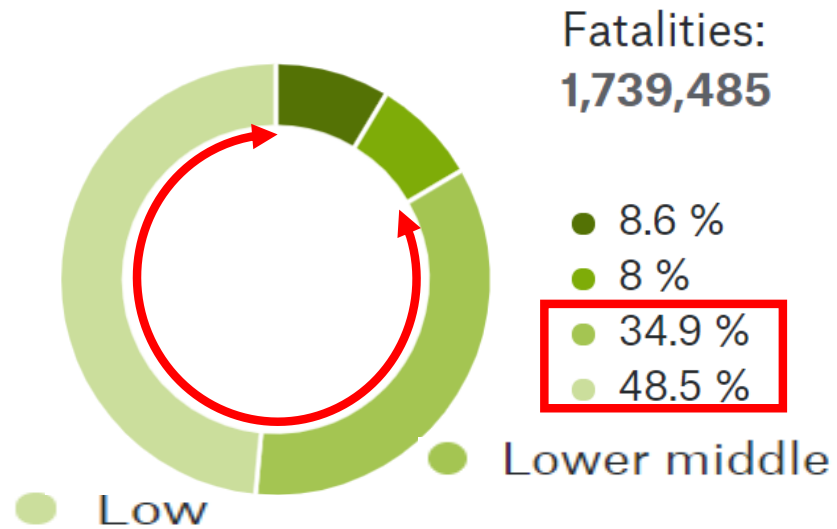
Roles of Science and Technology in Transformative Steps

Toshio KOIKE

Professor Emeritus, the University of Tokyo
Executive director, International Centre for Water Hazards and Risk Management
(ICHARM), Public Works Research Institute (PWRI)
Council Member, Science Council of Japan, Cabinet Office of Japan



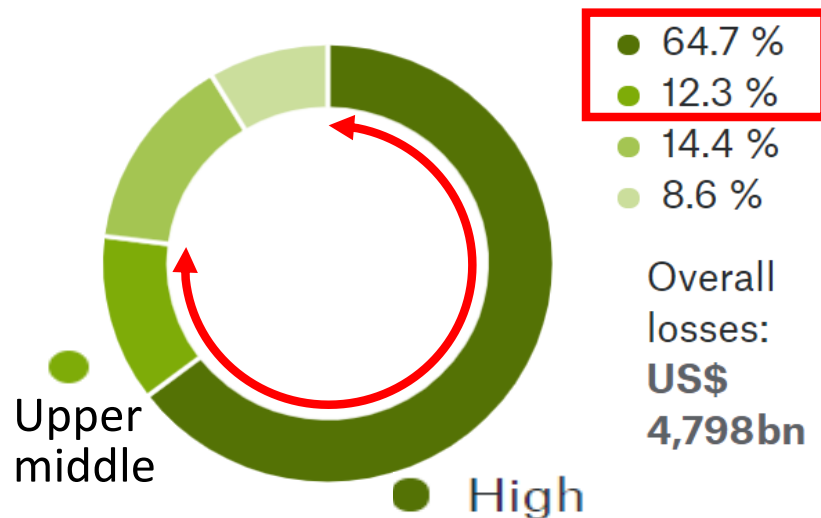
Overall Human Loss Events Worldwide 1980-2018



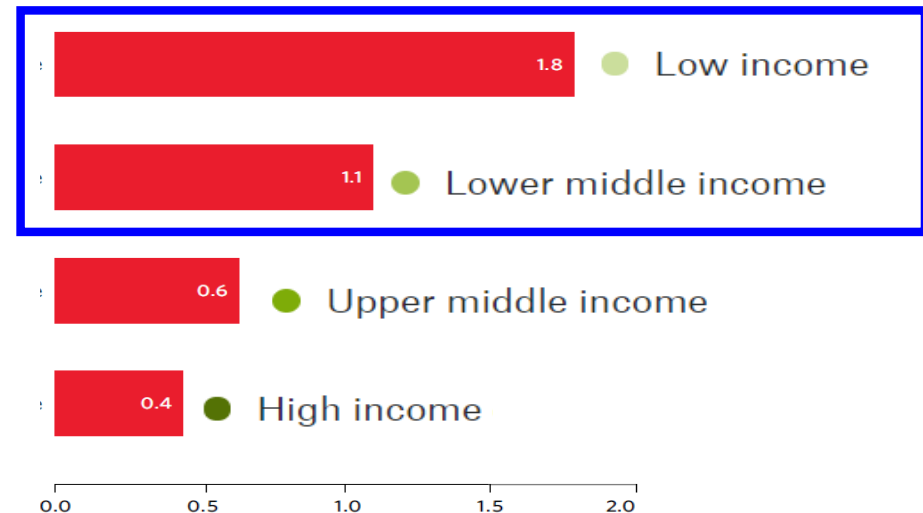
The 2030 Agenda

We are determined to take the bold and **transformative steps** which are urgently needed to shift the world onto a **sustainable and resilient path**. As we embark on this collective journey, we pledge that **no one will be left behind**.

Overall Economic Loss Events Worldwide 1980-2018



Economic losses (relative to GDP) caused by climate-related disasters, 1998-2017 (%)





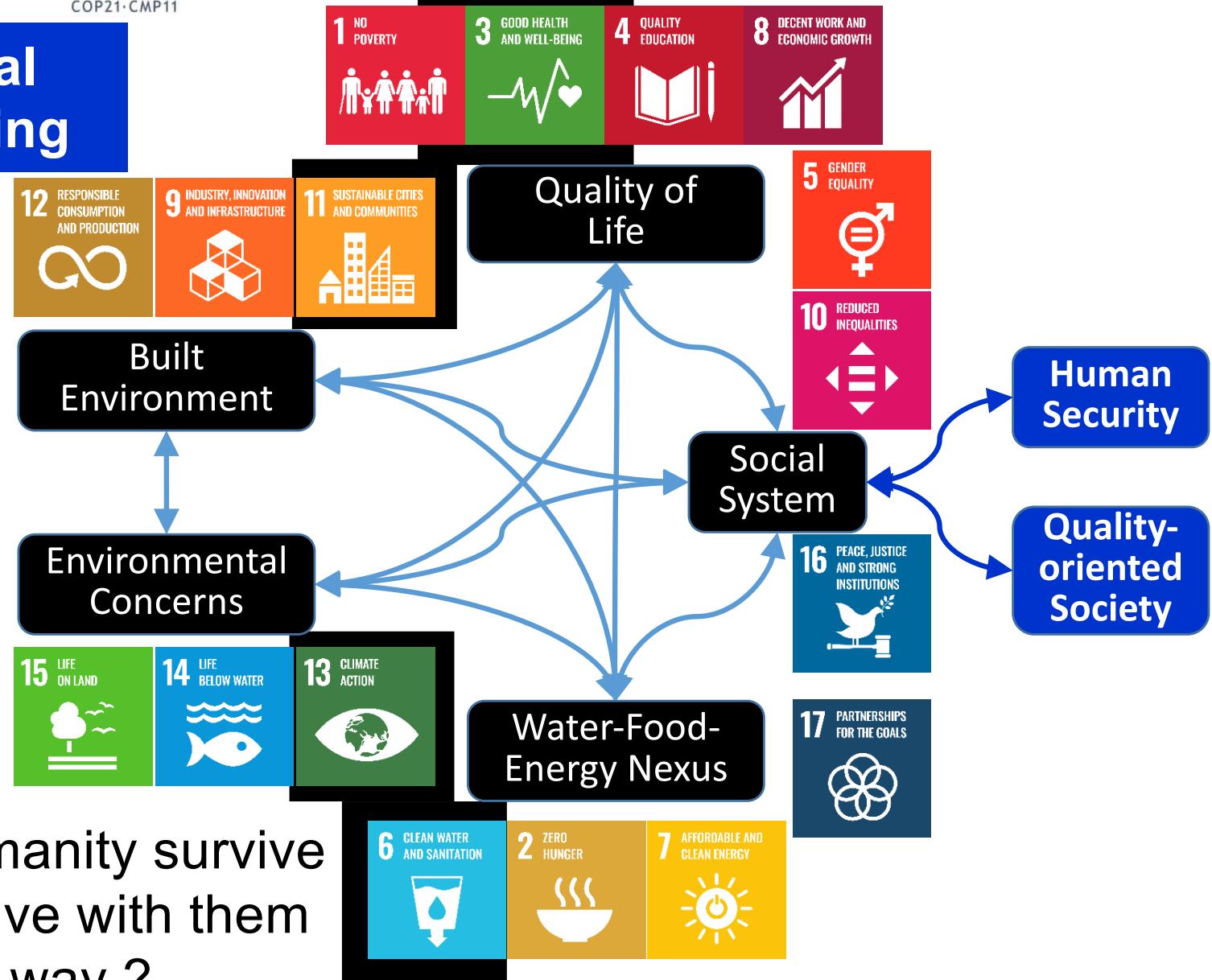
How should humanity survive such risks and live with them in a sustainable way ?



PARIS2015
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Cross-sectral Decison Making



How should humanity survive
such risks and live with them
in a sustainable way ?

The Fourth Asia Pacific Water Summit

Kumamoto. Japan, April 23-24, 2022

17 Heads of State and Government
19 government ministers.



Yoshiro Mori, President of the APWF and former Prime Minister, Japan



Emperor and Empress of JAPAN



Antonio Guterres, UNSG



Fumio Kishida, Prime Minister, Japan

Kumamoto Declaration

- Require transformation into quality-oriented societies that are resilient, sustainable, and inclusive.
- Improve governance, close the financial gap and appeal to the science and technology community.
- Explore what role science and technology should play in the cross-sectoral decision-making of leaders.

Kumamoto Initiative for Water

- Provide the hybrid technology that enable the implementation of both climate change **adaptation and mitigation** measures for dams.

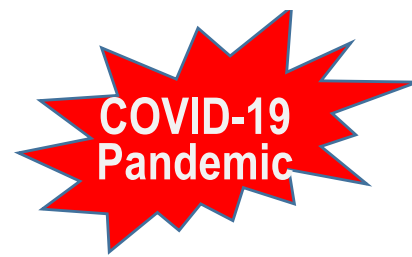
Chair's Summary



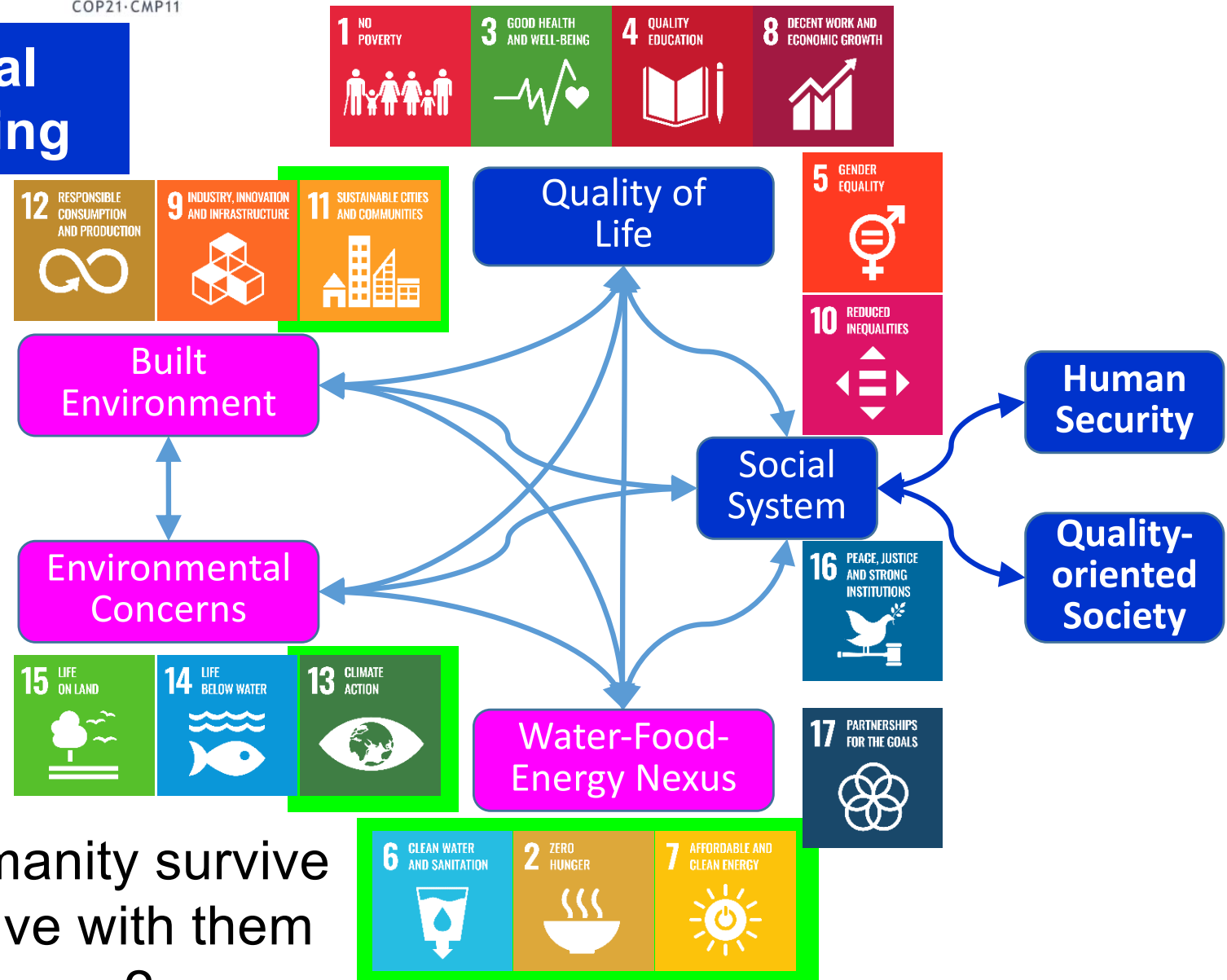
- Promote **water cycle consilience** by accelerating the Open Science policy, particularly focusing on observation, modeling and data integration;
- Foster "**Facilitators**," that is, catalytic beings who can lead the way toward resolving problems by providing professional advice on-site using a broad range of scientific and indigenous knowledge; and
- Work together beyond disciplines and sectors among different levels while taking an **end-to-end approach**.



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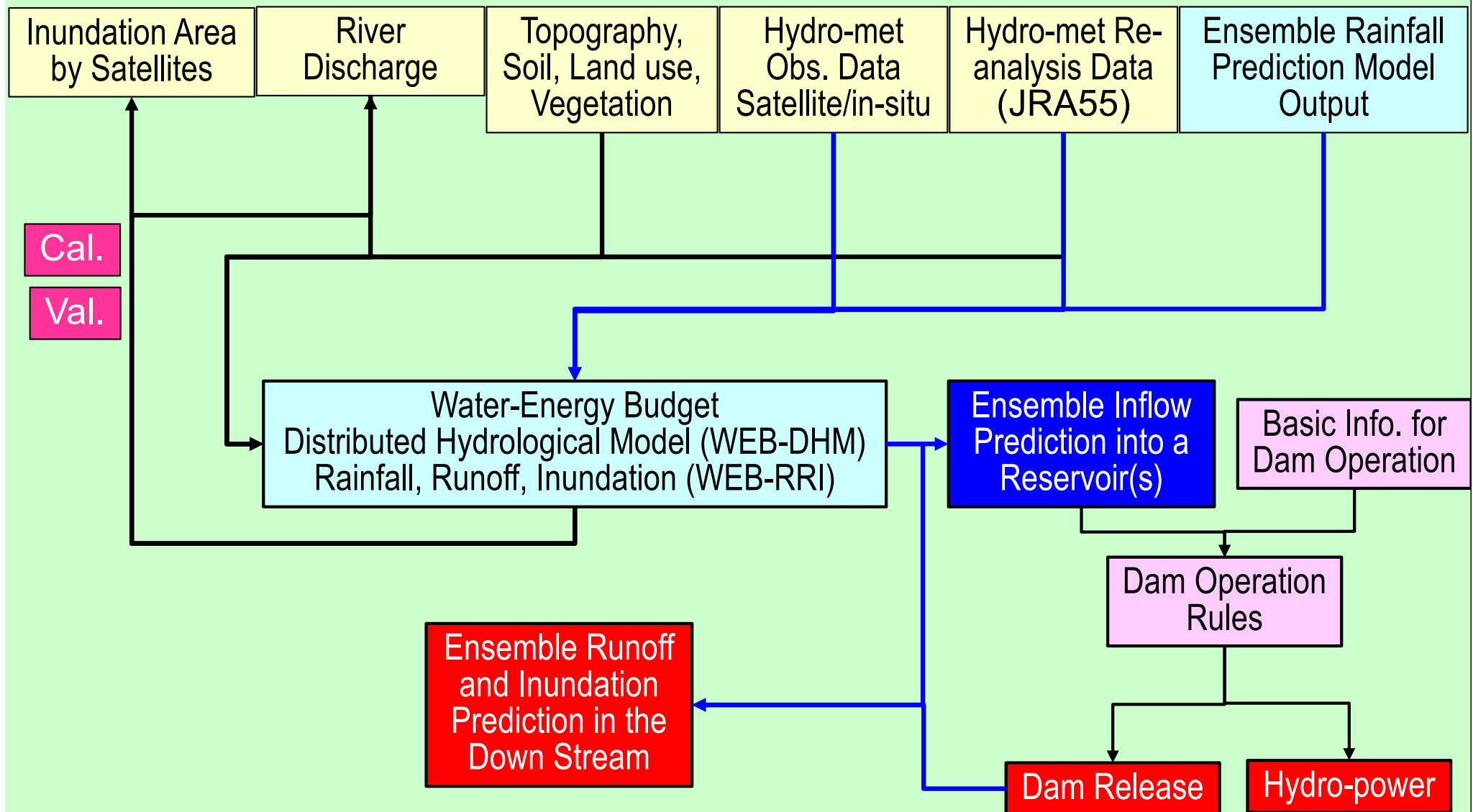


How should humanity survive such risks and live with them in a sustainable way ?

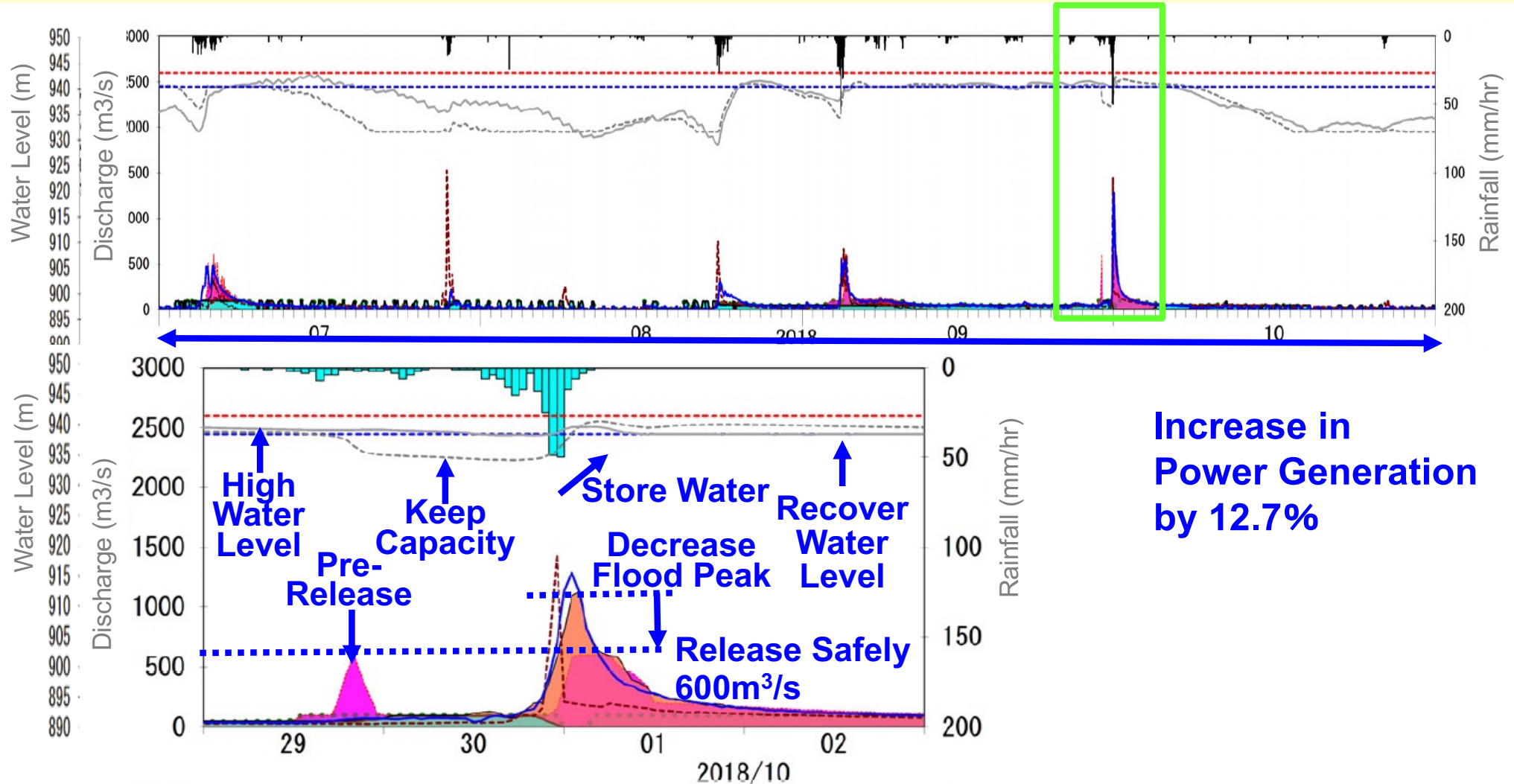
OPERATION SUPPORTING SYSTEM FOR HYDROELECTRIC DAMS TO IMPROVE FLOOD CONTROL AND POWER GENERATION

Runoff Simulation

Rainfall Prediction



System Evaluation: Dam Operation Supports 8



**Increase in
Power Generation
by 12.7%**

Observed

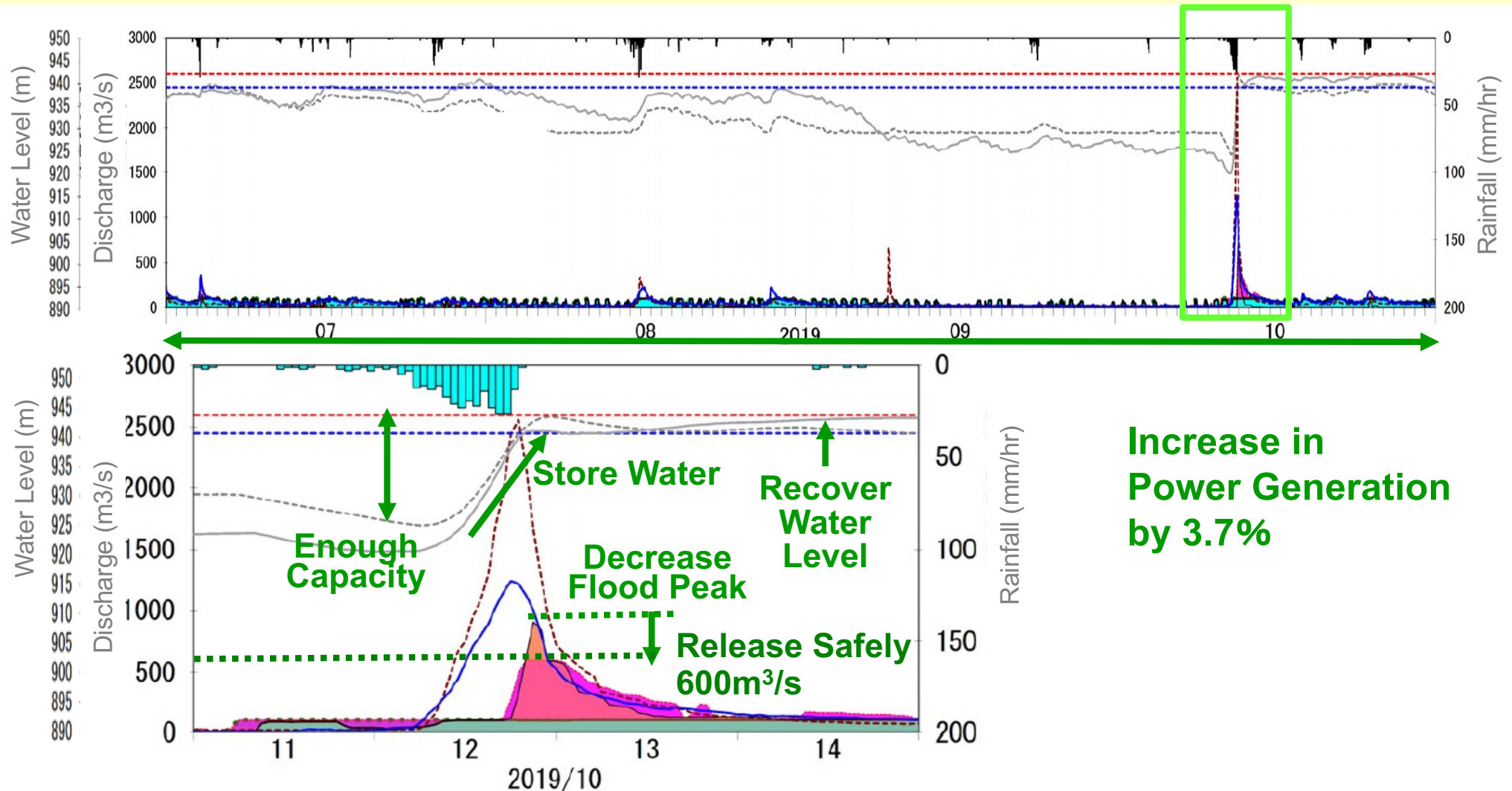
- rainfall
- inflow
- reservoir water level
- gate discharge
- discharge for power generation

Outputs from the support system

- forecasted inflow
- reservoir water level
- gate discharge
- additional discharge for power generation

- Full reservoir level
- Safe water use level

System Evaluation: Dam Operation Supports 9



**Increase in
Power Generation
by 3.7%**

Observed

- rainfall
- inflow
- reservoir water level
- gate discharge
- discharge for power generation

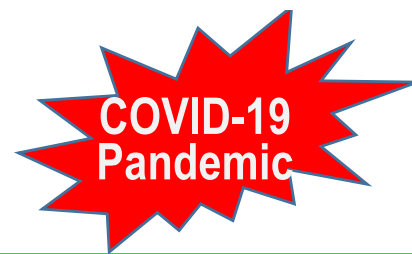
Outputs from the support system

- - - forecasted inflow
- - - - reservoir water level
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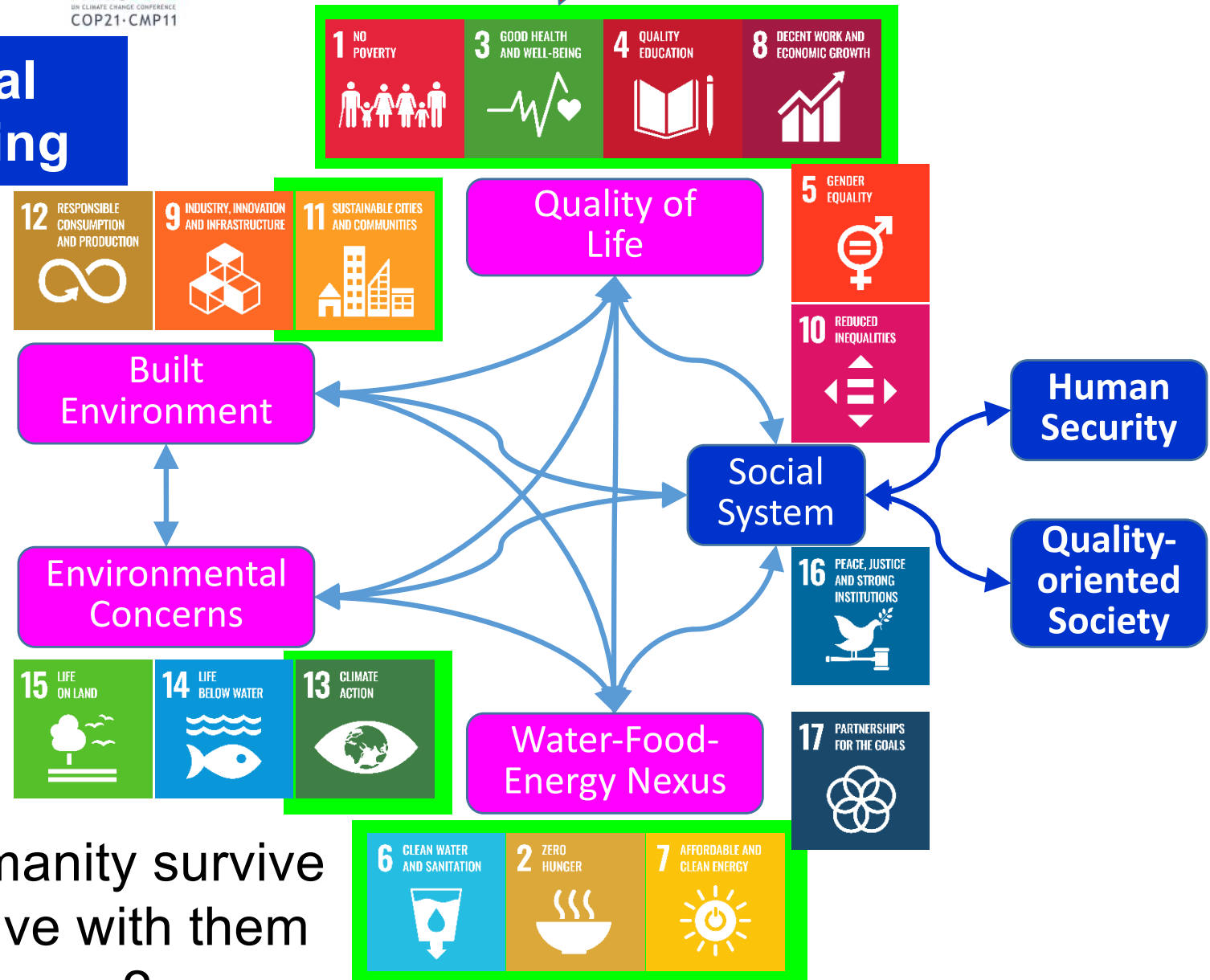
- - - Full reservoir level
- - - Safe water use level



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Cross-sectral Decison Making

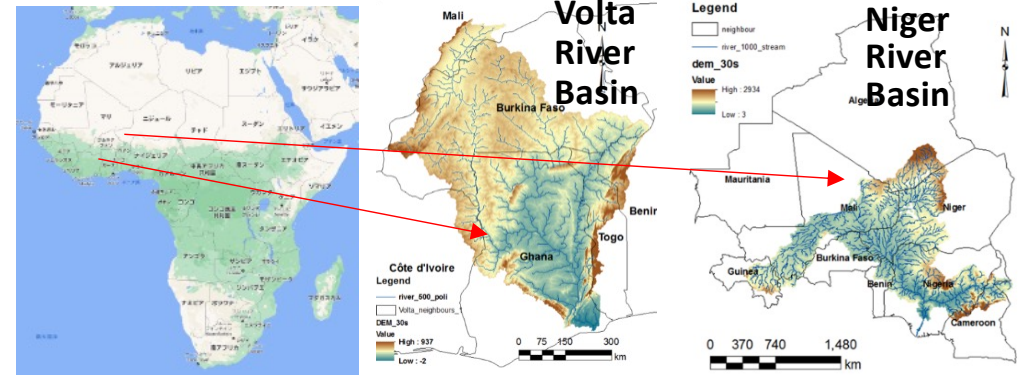


How should humanity survive
such risks and live with them
in a sustainable way ?

Water Disaster Platform to Enhance Climate Resilience in Africa (WaDiRe-Africa)



WaDiRe-Africa, UNESCO project funded by the Government of Japan, aimed to develop a prototype of OSS and implemented capacity building programs for fostering Facilitators, focusing on flood early warning, hazard mapping and contingency planning.



Kick-off Meeting in Lome, Togo, in June 2019



Development of Flood Early Warning System for West Africa

e-Learning Training

- Training of Experts (ToE)
- Fostering of Facilitators (FoF)

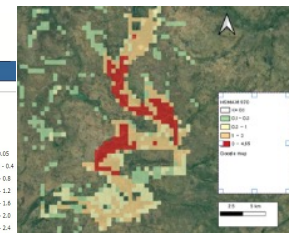
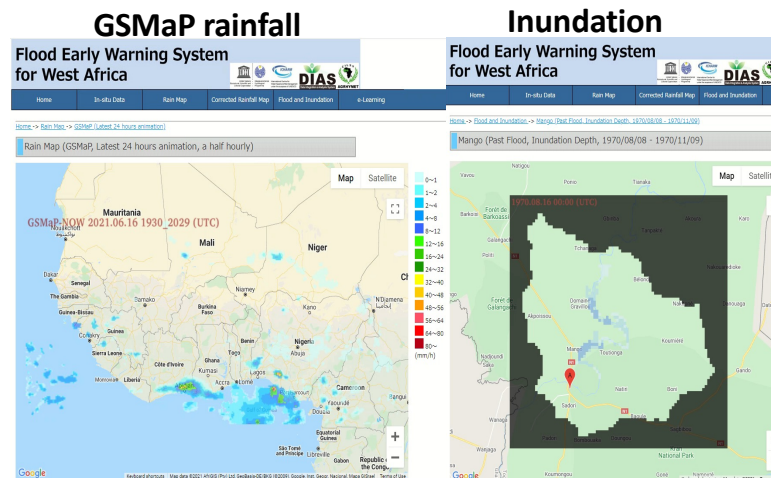
1. ToE: Four weekly sessions

- Lecture, Tutorials, Q&A Session
- 288** participants, **197** certificated

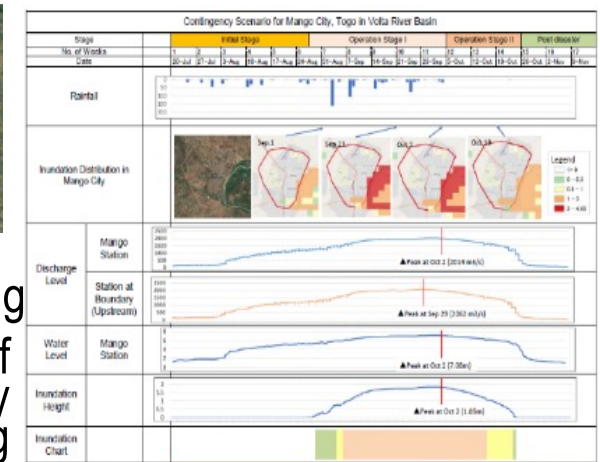
2. FoF: Two weekly sessions

- Lecture, Q&A Session
- 44** participants, **30** certificated

Near real-time flood simulation by Water and Energy Budget Rainfall-Runoff-Inundation (WEB-RRI) Model on Data Integration and Analysis System (DIAS)



Tutorial of hazard mapping
Tutorial of Contingency Planning



UN 2023 Water Conference

New York, March 22-24, 2023

*I believe that the building process of a sound water cycle itself
can also contribute to peace-building.*

**The key for breakthrough is, among other things, the Open
Science Policy, facilitation between science and decision
making, end-to-end approach, and water cycle integration.**

Mr. Sewilam and Ms. KAMIKAWA
Co-chairs, Interactive Dialogue
Water for Climate, Resilience and Environment