World Meteorological Organization

Weather • Climate • Water

Water Disasters
Challenges and Opportunities

Face-to-face (F2F) event of the Swiss NGO DRR Platform

Thun, Switzerland, 11 November 2015

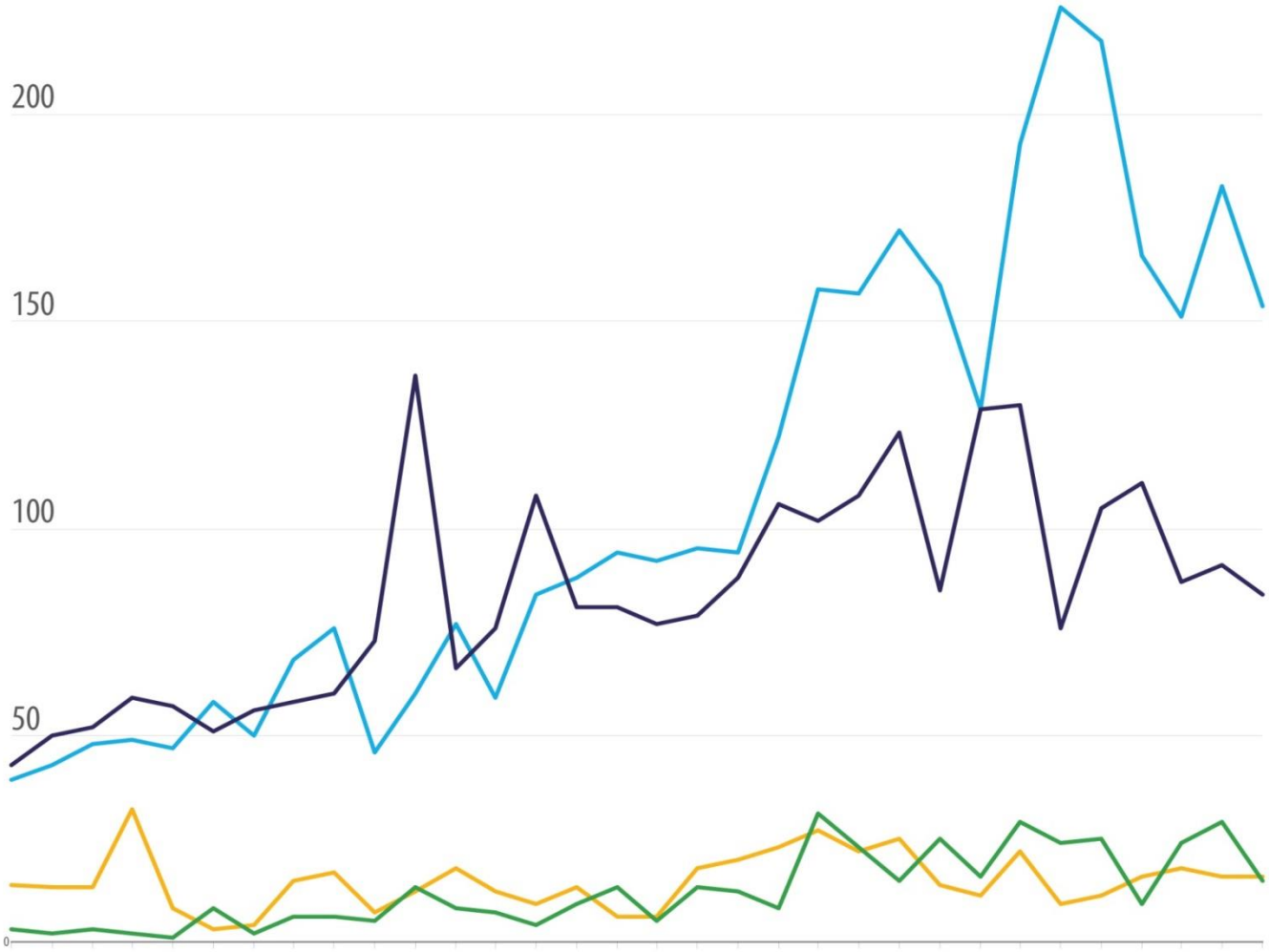
Number of Climate-related Disasters Around the World (1980-2011)

3455 FLOODS

2689 STORMS

470 DROUGHTS

395 EXTREME TEMPS



	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
FLOOD	39	43	48	49	47	58	50	68	76	46	60	77	59	84	88	94	92	95	94	122	158	157	172	159	129	193	226	218	166	151	183	154
STORM	43	50	52	59	57	51	56	58	60	73	137	66	76	108	81	81	77	79	88	106	102	108	123	85	129	130	76	105	111	87	91	84
DROUGHT	14	13	13	32	8	3	4	15	17	7	12	18	12	9	13	6	6	18	20	23	27	22	25	14	11	22	9	11	16	18	16	16
EXTREME TEMPERATURE	3	2	3	2	1	8	2	6	6	5	13	8	7	4	9	13	5	13	12	8	31	23	15	25	16	29	24	25	9	24	29	15

UNISDR

The United Nations Office for Disaster Risk Reduction
http://www.unisdr.org

Version: 13 June 2012

DATA SOURCES

EM-DAT - http://www.emdat.be/ - The OFDA/CRED International Disaster Database; Data version: 13 June 2012 - v12.07

Humanitarian Symbol Set (2008): http://www.ungiwg.org/map/guideline.php

Sendai Framework & SDGs

Sendai Framework

- **World Conference on Disaster Risk Reduction** (March 2015)
  - Working session on water and disasters
    Emergency preparedness

- **Sendai Framework for Disaster Risk Reduction 2015-2030**
  - Understanding disaster risk
    Strengthening disaster risk governance
    Investing in disaster risk reduction for resilience
    Enhancing disaster preparedness for effective response

Sustainable Development Goals

- **SDG 11.5**

  By 2030, significantly reduce the number of deaths *and the number of* people affected *and substantially decrease the* direct economic losses *relative to global gross domestic product caused by disasters, including water-related disasters […]*

What are we doing about it at WMO?

Understanding disaster risk

- APFM, IDMP

Strengthening disaster risk governance

- APFM, IDMP, DRR

Investing in disaster risk reduction for resilience

- WHYCOS, FFGS

Enhancing disaster preparedness for effective response

- FFGS, APFM, IDMP, DRR

Understanding risk, strengthening governance, enhancing preparedness

Associated Programme on Flood Management

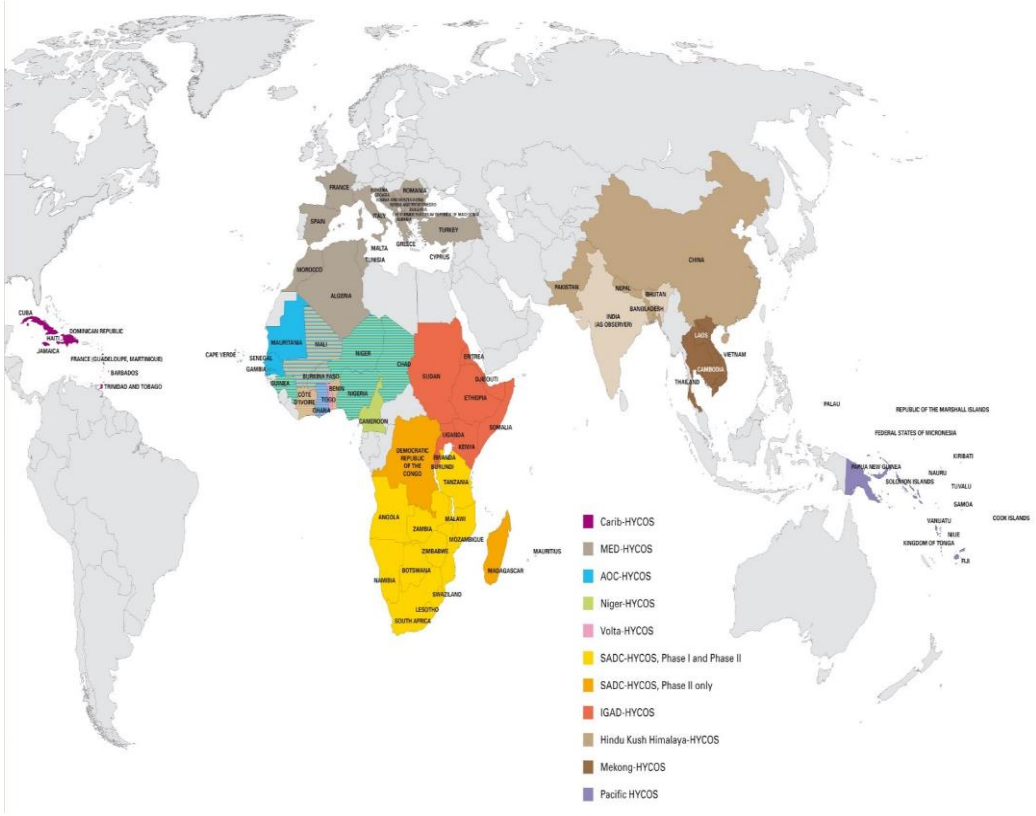
(since 2001)

Integrated Drought Management Programme

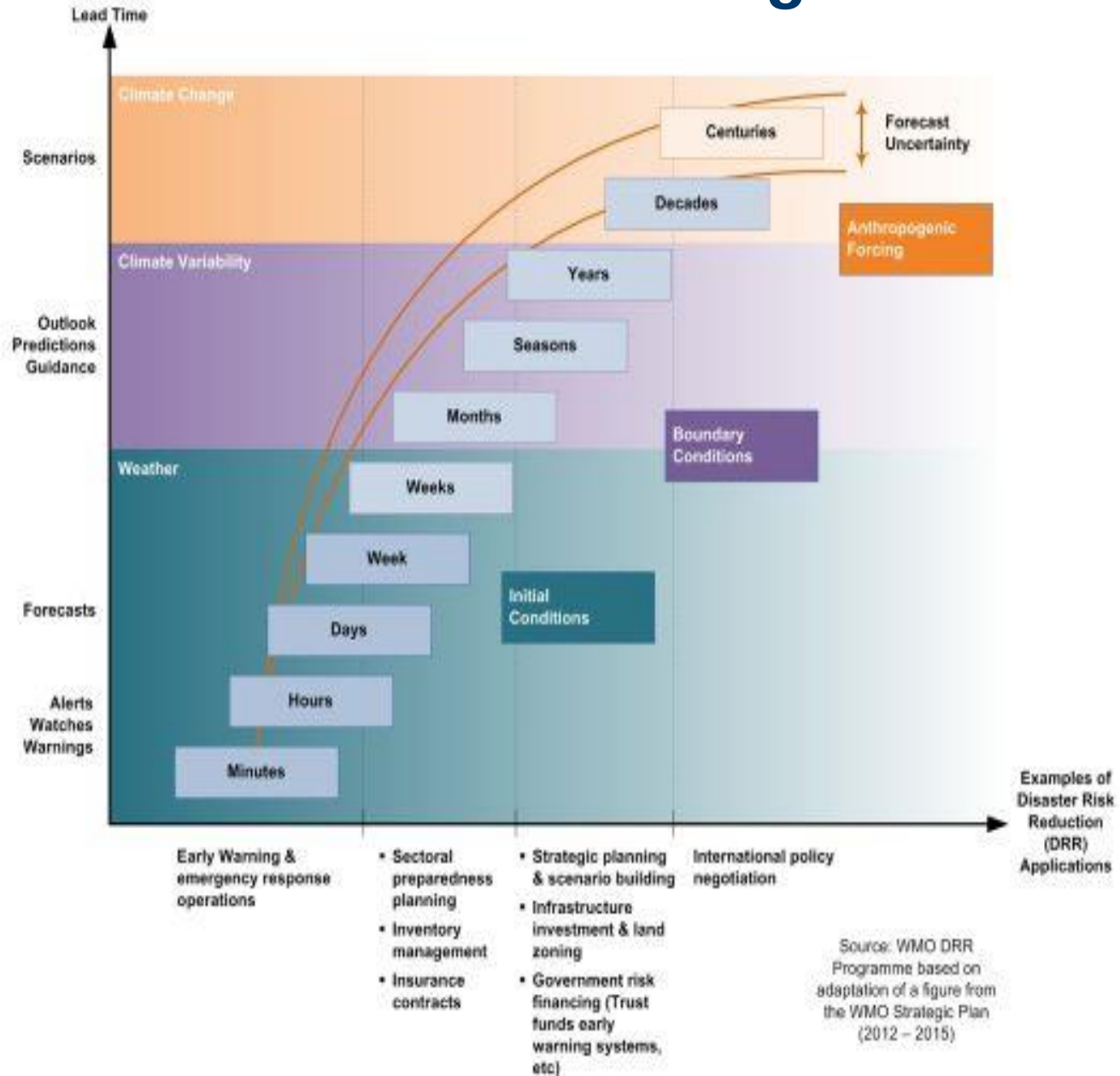
(since 2013)

Investing in disaster risk reduction for resilience - WHYCOS

- **WMO global framework programme** aiming at:
  - improving basic observation activities and data management
  - strengthening international cooperation and data exchange
- Implemented through independent but coordinated **basin-wide regional components**



Preparedness: WMO DRR Programme



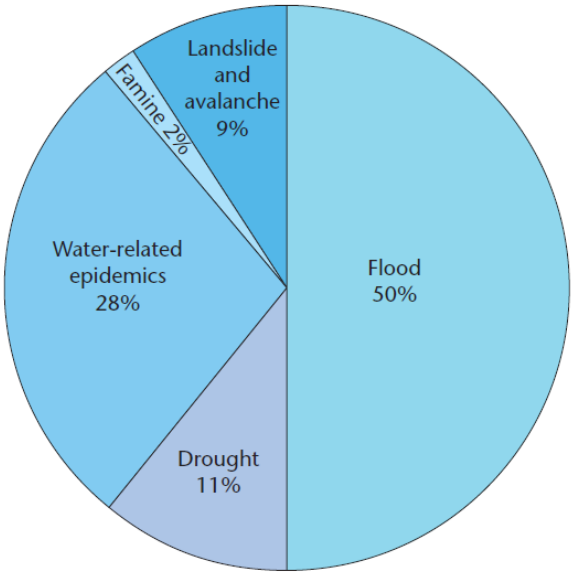
Source: WMO DRR Programme based on adaptation of a figure from the WMO Strategic Plan (2012 – 2015)

Why flood warning is so important?

"There are two types of levees, those that have been overtopped by floodwaters, and those that will be"

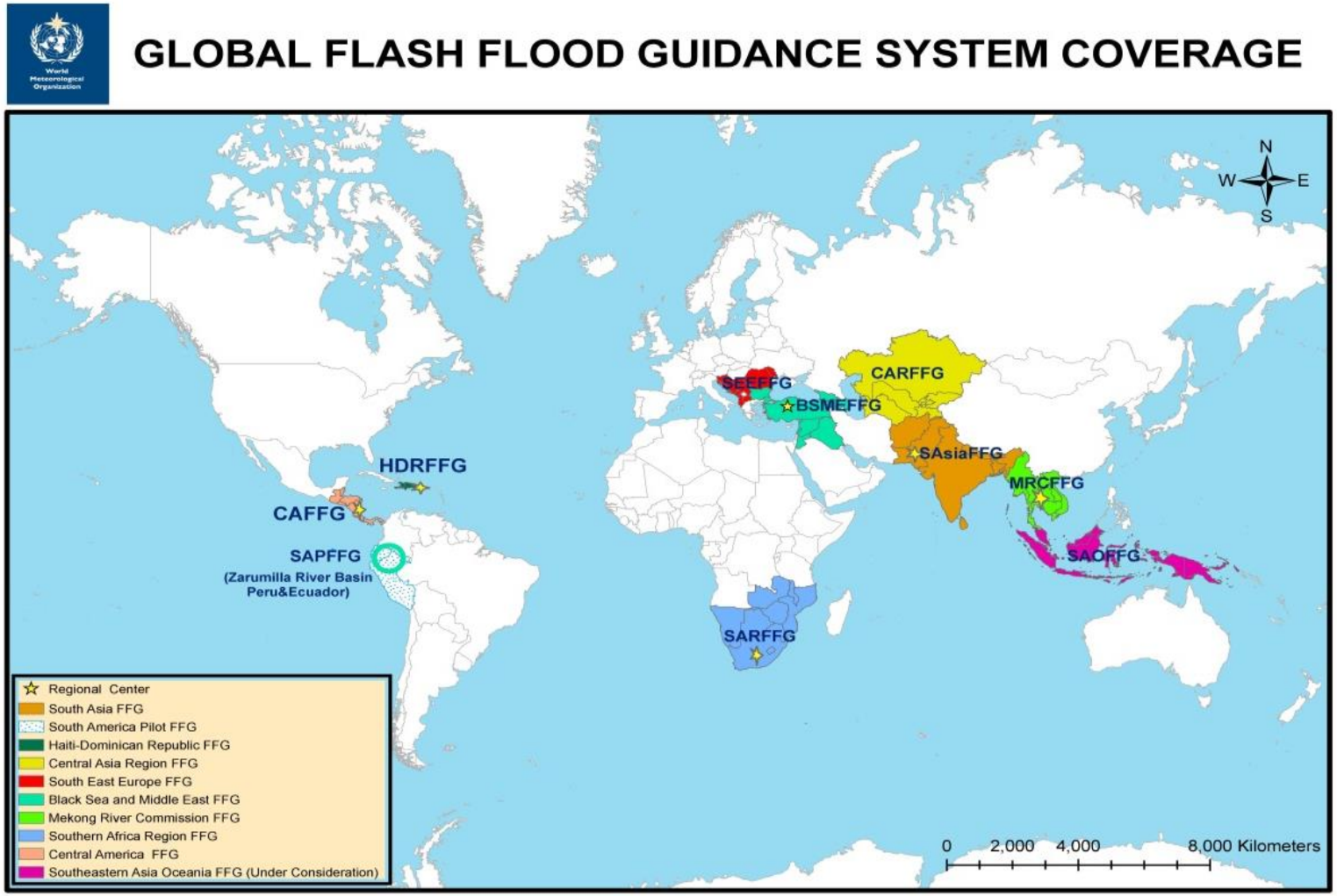
William Hammon Hall, first State Engineer of California, 1880

- Human pressure and increased urbanization have led the majority of the world population to live in flood-prone areas
- Exposure to floods can only be reduced, but should be integrated by preparedness
- Preparedness requires to know when (and possibly how) a flood is going to occur



Water-related natural disasters, 1990–2001

Flash Flood Guidance System



Services

Enhance capacity to issue flash flood warnings and alerts

Enhance collaborations between NMHSs and Emergency Management Agencies

Generate flash flood early warning products by using state-of-the-art hydrometerological forecasting models

Provide extensive training including on-line training to the hydrometeorological forecasters

Challenges

Decide on acceptable risk (damage/yr, fatalities/yr, disruption)

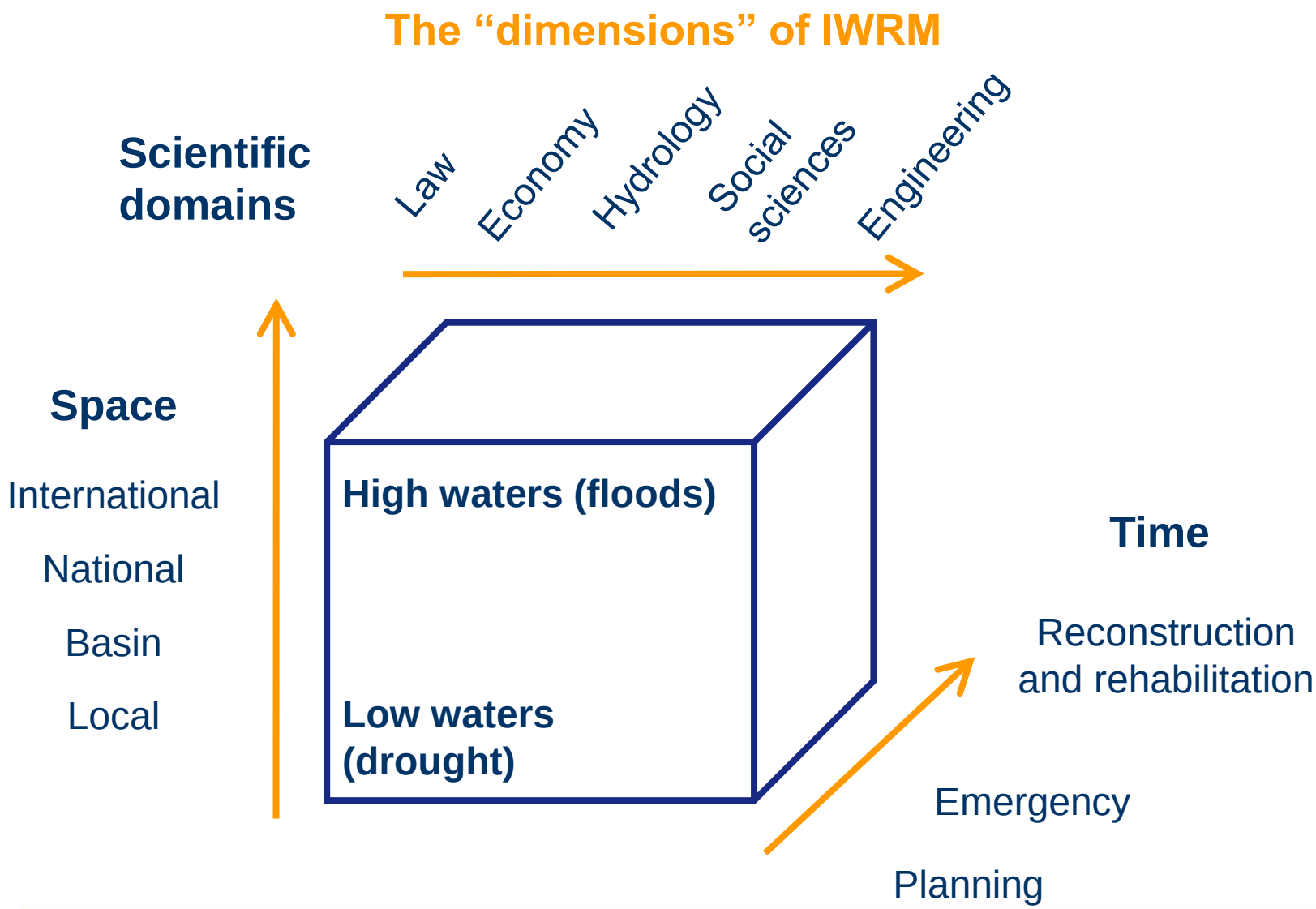
Decide on optimum combination of measures (protection, land use, preparedness/response)

Deal with uncertainty issues (climate variability and change, economic and demographic development)

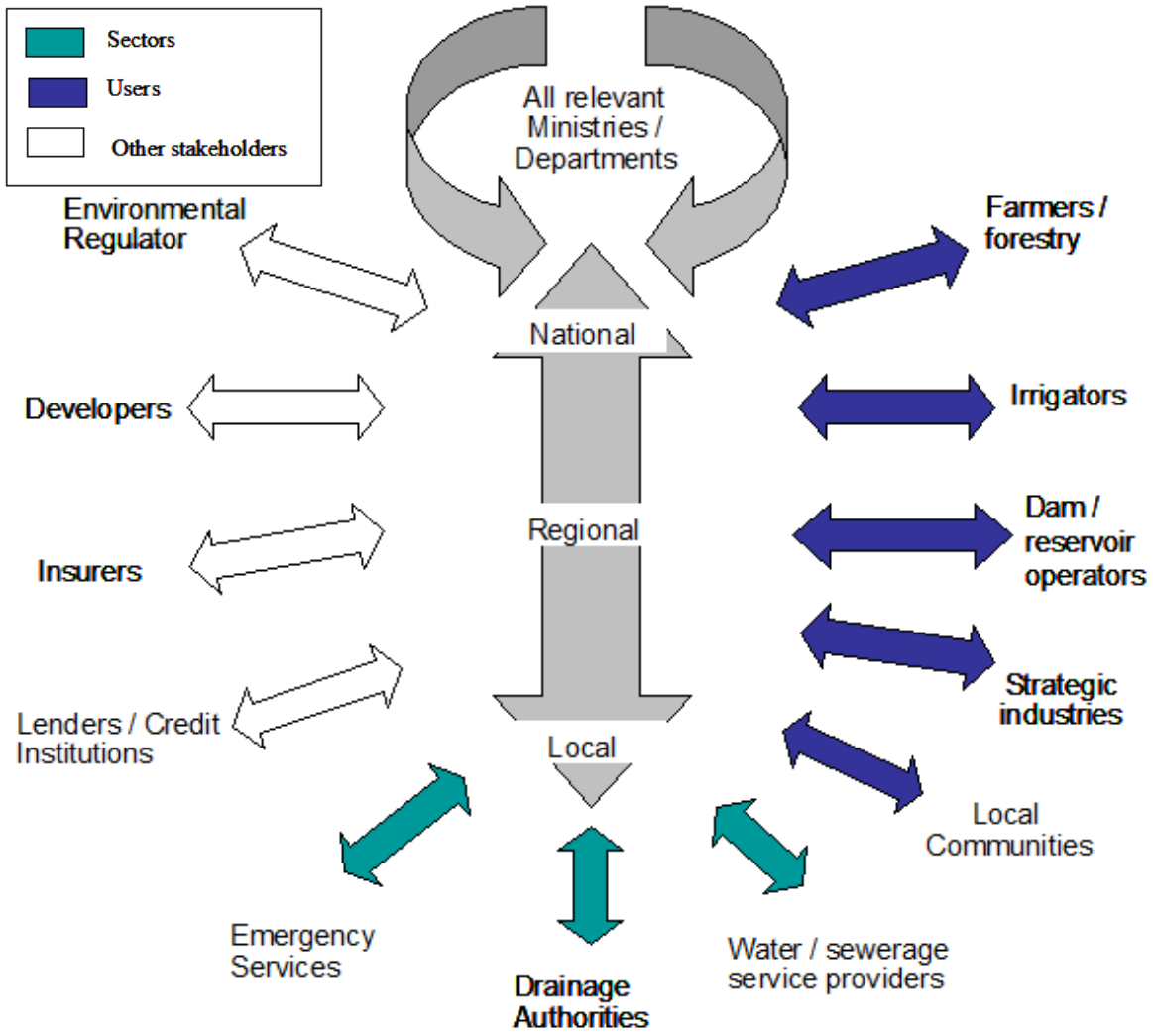
Bring the science base to the understanding of the decision makers

Reach affected people

Interdisciplinarity



Stakeholders participation



- **Involvement of all stakeholders** in the dialogue/ decision-making process
- **Decentralization** of decision-making with appropriate mechanisms
- Optimal mix of **bottom-up and top-down** approaches
- Effective **conflict resolution** mechanisms

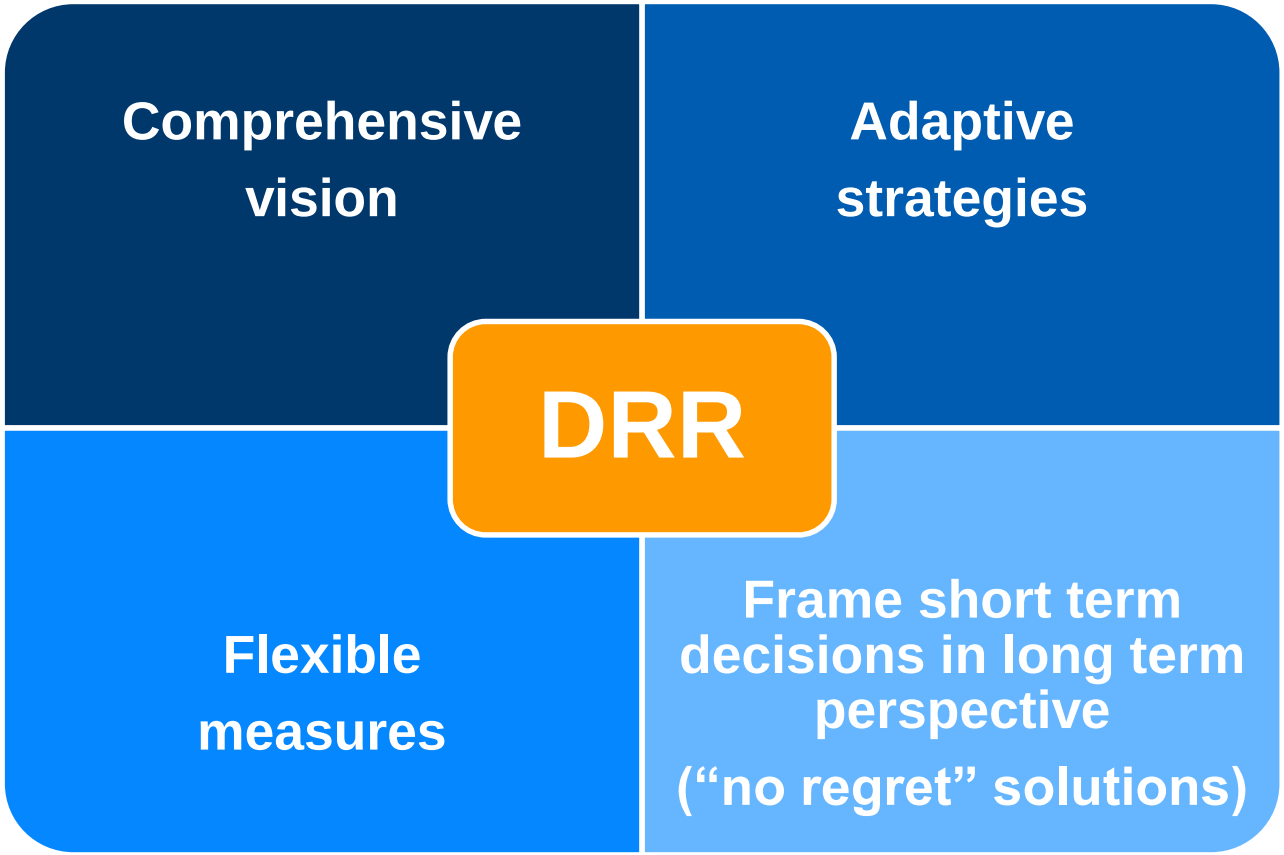
Recipe for securing meaningfull stakeholder interaction

1. Identify the problem in scientific terms
2. Understand the main user (decision maker) needs
3. Translate the problem according to the decision maker needs
4. Assess the needs of the other users (floodprone population, other stakeholders)
5. Mediate between the different parties to reach an optimal solution (if not possible, aim at no-regret solutions)
6. Check the technical feasibility of the identified solution
7. Invest in communication specialist to announce the details of the solution to ensure a participatory approach

Lessons learnt

In light of the different aspects to be considered (economic growth, demographic pressure, climate variability and change),

water management strategies for DRR should reflect:



Conclusions

An **Integrated approach to Water Resources Management** can contribute to DRR by:

Risk based approach (cycle of disaster management)

Long term perspective (adaptive strategies, flexible measures)

Building partnerships, involve stakeholders and linking agendas

Adequate institutional arrangements

World Meteorological Organization

Weather • Climate • Water

Johannes Cullmann

Director, Climate and Water Department, WMO

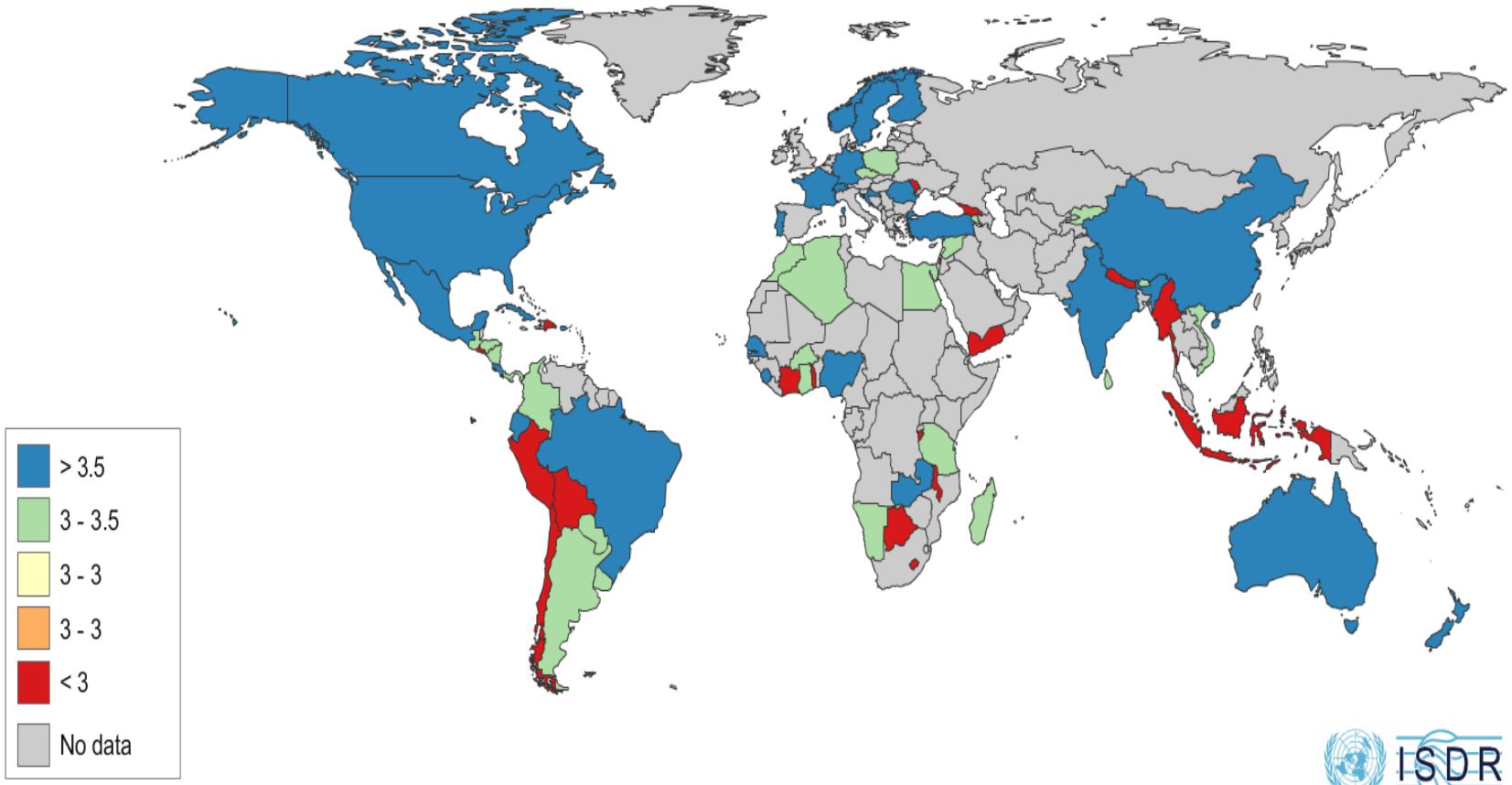
National priority and institutional setting

Disaster risk awareness and early warning

Culture of safety and resilience at all levels

Reduce risk factors

Strengthen disaster preparedness



2011

ISDR
United Nations
International Strategy for Disaster Reduction