Disaster Risk Reduction (DRR) in WASH / water sector

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Swiss NGO DRR Platform

Learning Event

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Outline

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➢ The problem side:

What are we talking about - Why DRR?

- Rationale and DRR basics
- Water related hazards
- Disaster impacts in the water sector

➢ The solution side:

How to do DRR?

- Concepts of DRR measures
- Examples of DRR measures in the water sector

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Impacts and rationale for DRR

The PROBLEM side

What's DRR? - Disaster statistics

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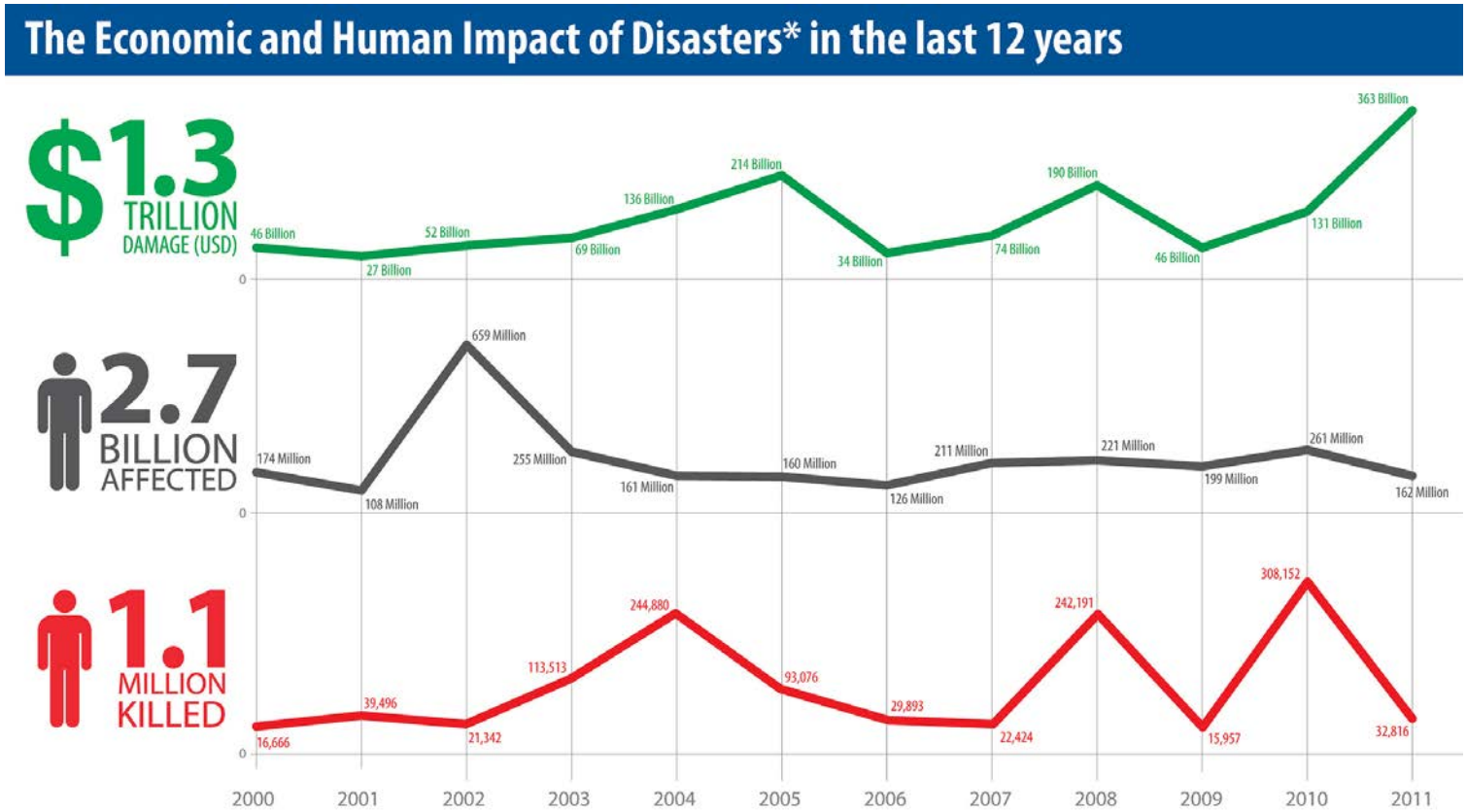

- Killed: Mainly EQ, some improvements. 95% of deaths in developing countries (IPCC)
- Affected: Mainly floods. 65% of world population affected during last 20 years (ISDR)
- Losses: Over 42 % of economic losses due to extensive risks (GAR 2013).
  E.g. Dammage of hurricane Mitch represented 80% of GDP of Honduras (USGS).

Why DRR?

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- Increase in frequency and intensity of events
- …due to exposure, vulnerability and climate change
- Most vulnerable population is disproportionally affected
- Implications for sustainable development

Relevance of DRR for us & focus of the LE:

- Multi-hazard: intersection DRR/ACC/ environment/human activities
- Extensive risks
- Damage: affected people and livelihoods
- Relevance for emergencies and development efforts
- Focus on prevention
- DRR as cross-cutting topic, disaster resilience to ensure interventions' sustainability

What's DRR? - DRR basics & focus

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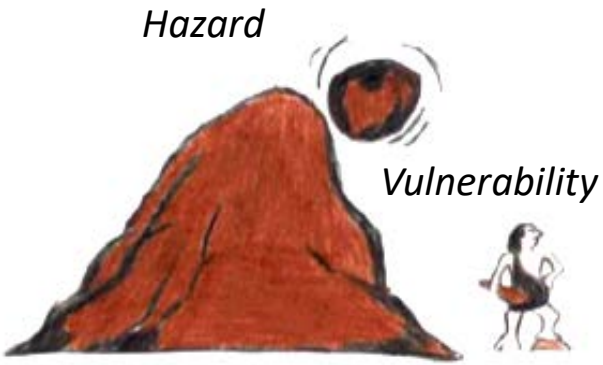


Hazard ≠ Disaster

HAZARD a dangerous phenomena

LE-focus: water / WASH infrastructure related hazards

VULERNABILITY ≠ coping capacities

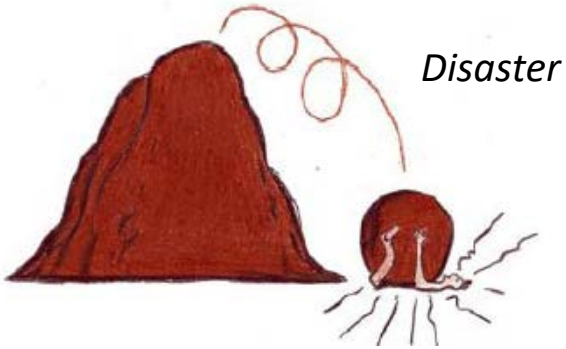
characteristics to suffer damages

LE-focus: beyond physical vulnerabilities

DISASTER

a serious disruption with loss/damage

LE-focus: people's livelihoods and assets



RISK

Depends on the impact and probability.

LE-focus: Extensive risks

$$\text{Risk} = \frac{\text{Hazard x Vulnerability}}{\text{Capacities}}$$

Risky?

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What's DRR? unnatural disaster

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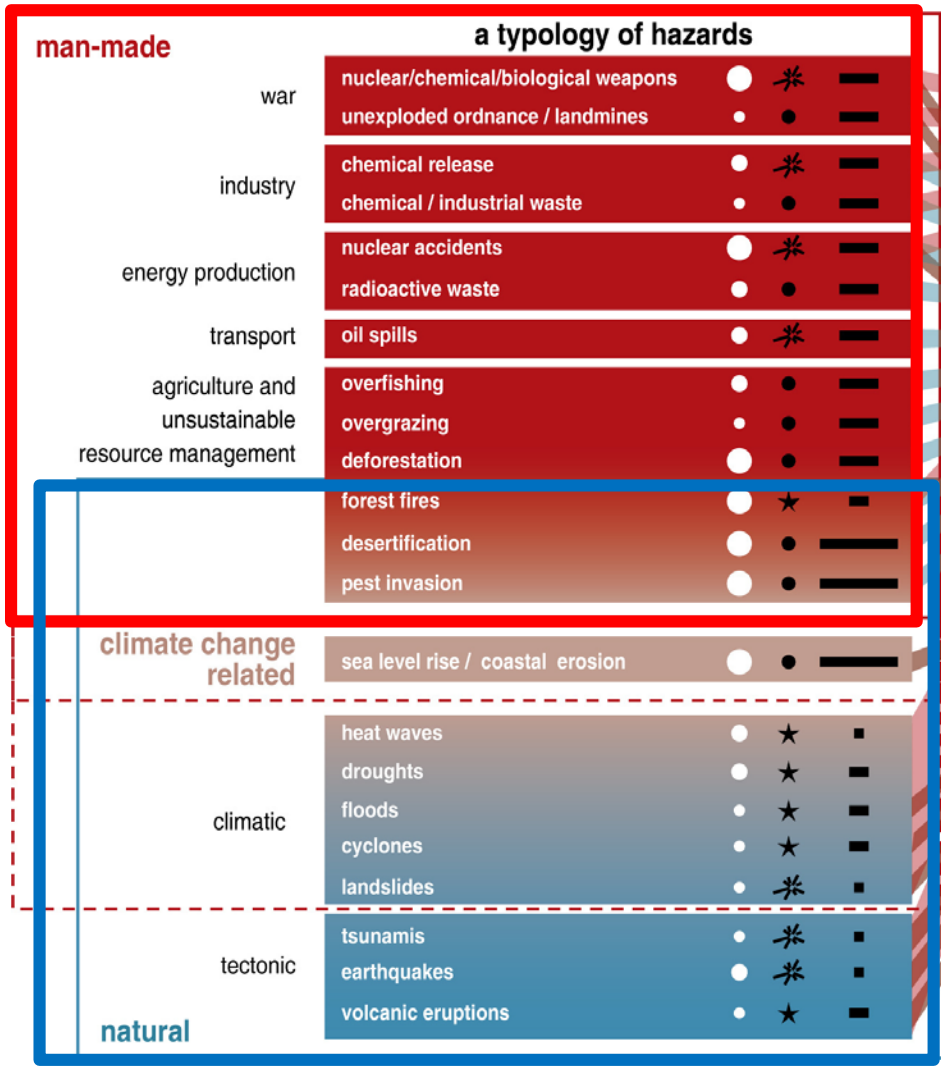
- Natural hazard, unnatural disaster
- Overlap of natural hazards, climate change, environmental degradation
- Different causes often with similar impacts
- Scale, intensity, velocity as parameters of perception and impact.



Water/WASH & DRR linkages

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A complex topic…

- Too much & too little water
- Water as resource & threat
- Multiple disciplines & actors
- Various scales of space
- Different moments in time

Some facts

- 90% of disaster affected people are water related
- 33 % of disaster losses related to floods (GAR 2014)
- 63 % disaster losses related to water (data 1992-2014)
- Haiti earthquake caused 100’000 – 160’000 deaths, the subsequent cholera outbreak about 8’500 deaths (wiki)
- Every minute a newborn dies from infection caused by lack of safe water and an unclean environment. (WHO, 2015)
- Every $1 invested in water and toilets returns an average of $4 in increased productivity. (WHO, 2012)

Relevant hazards in the water sector

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Multiple causes (hazards)

- Drought
- Landslides
- Floods
- Sea level rise
- Salinization
- Environmental degradation

Disaster impacts in the water sector

Conflicts over water resources

Pollution of water resources

Flooding

Scarcity of water resources

Disaster impacts in the water sector

Damaged WASH infrastructure, e.g. landslide

Flooded latrine

Conflicts (e.g. water price)

Water contamination

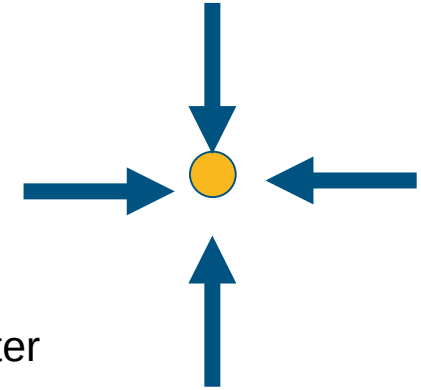
Wells drying out

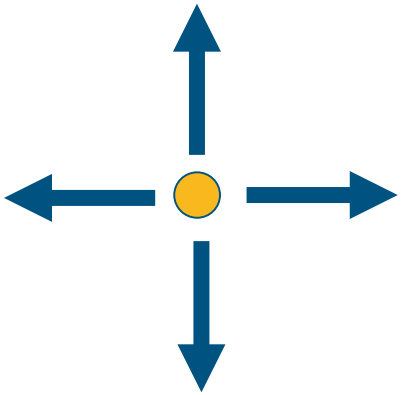
Disaster impacts for the water sector

WASH /water services:

> Might suffer disaster impacts

> Might trigger disasters





Challenge of too much / not enough water

- High dependence on environmental / disaster context

Multi-disciplinarity:

DRR

Wash / Infrastructure

Governance / management etc.

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2. Options for D R R ?

The SOLUTION side

DRR concept

DRR:

Concept and practices to reduce disaster risks through systematic efforts to analyze and manage the causes and factors of disaster risks.

$$\text{Risk} = \frac{\text{Hazard} * \text{Vulnerability}}{\text{Capacities}}$$

Integrated DRR

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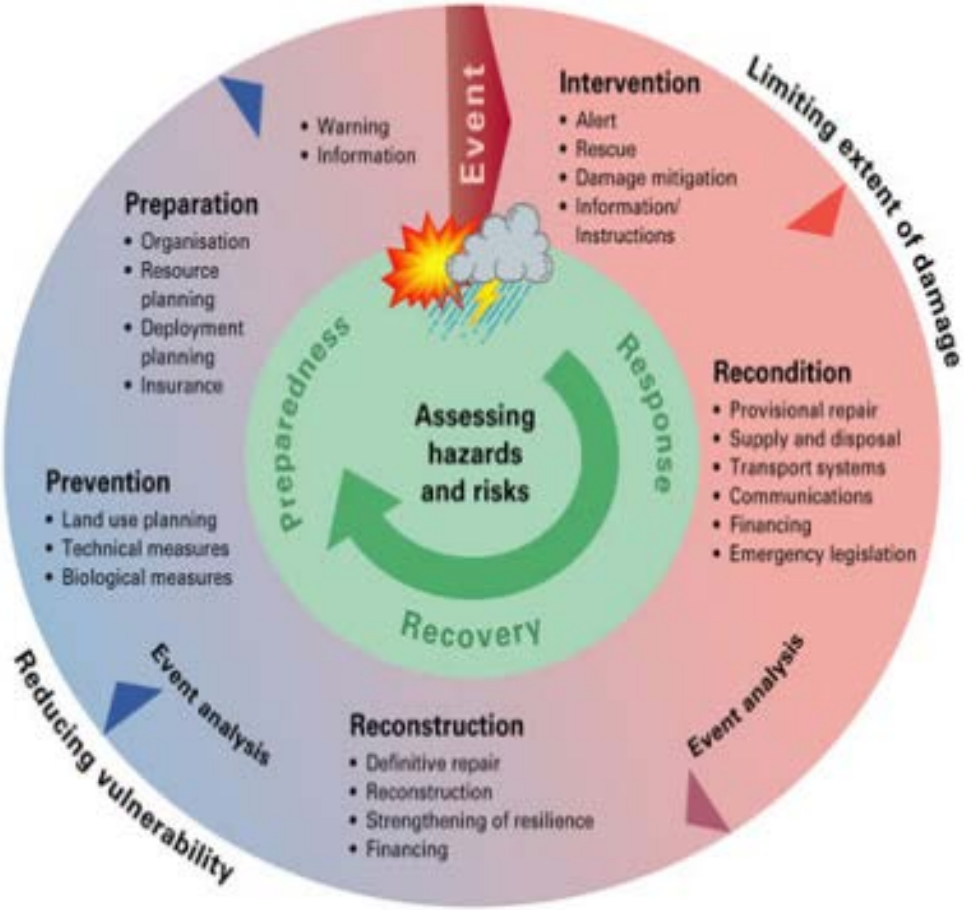
- Interventions before, during and after an event.
- Shift
  - from reaction to prevention.
  - from risk reduction to management.
- Combination of measures
  - ”hard” & ”soft” measures
  - reduce risks and adapt
  - prevent new risks
  - operational & strategic
  - Targeted and mainstreaming



WASH / IWRM

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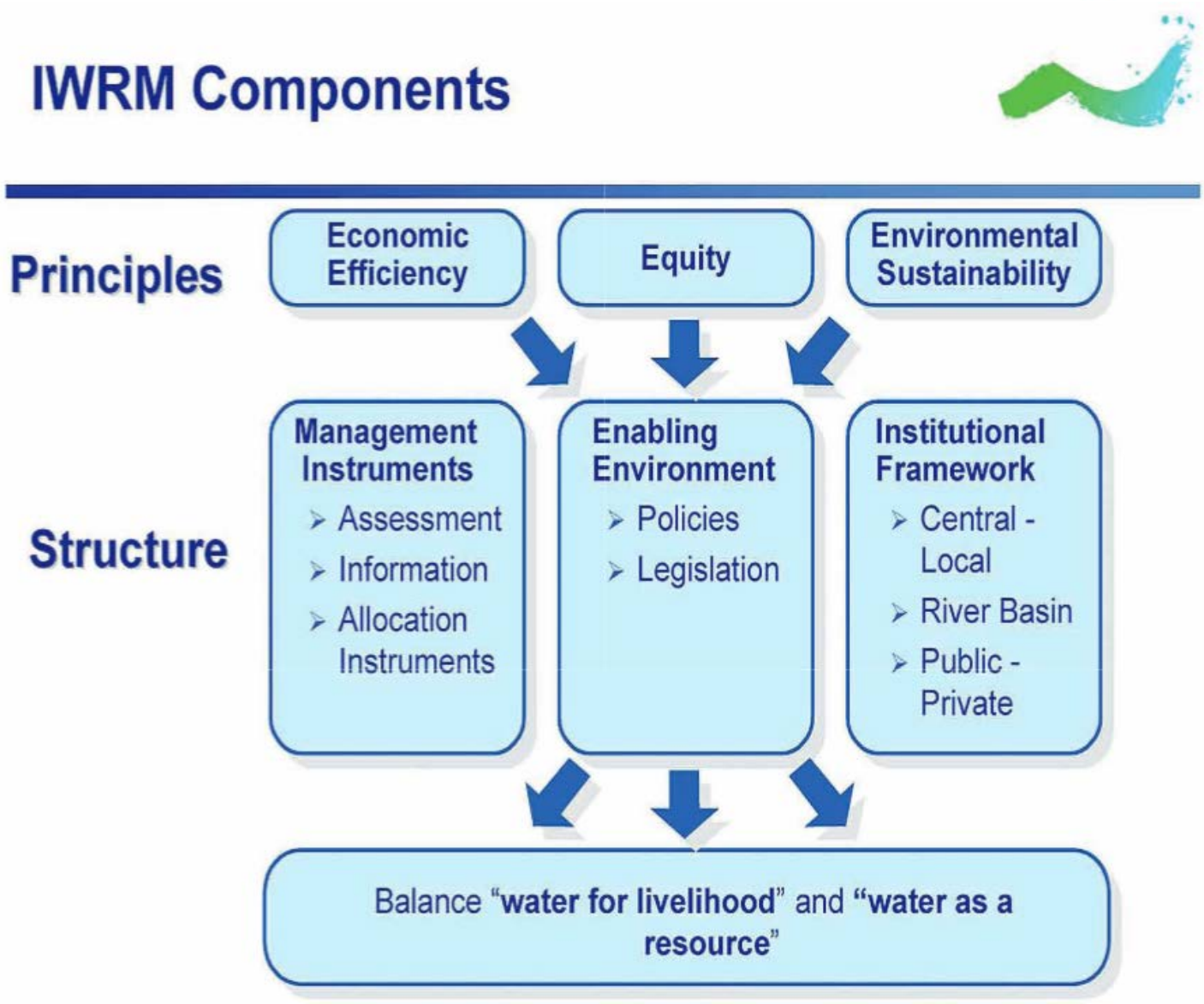
IWRM Components



WASH / IWRM

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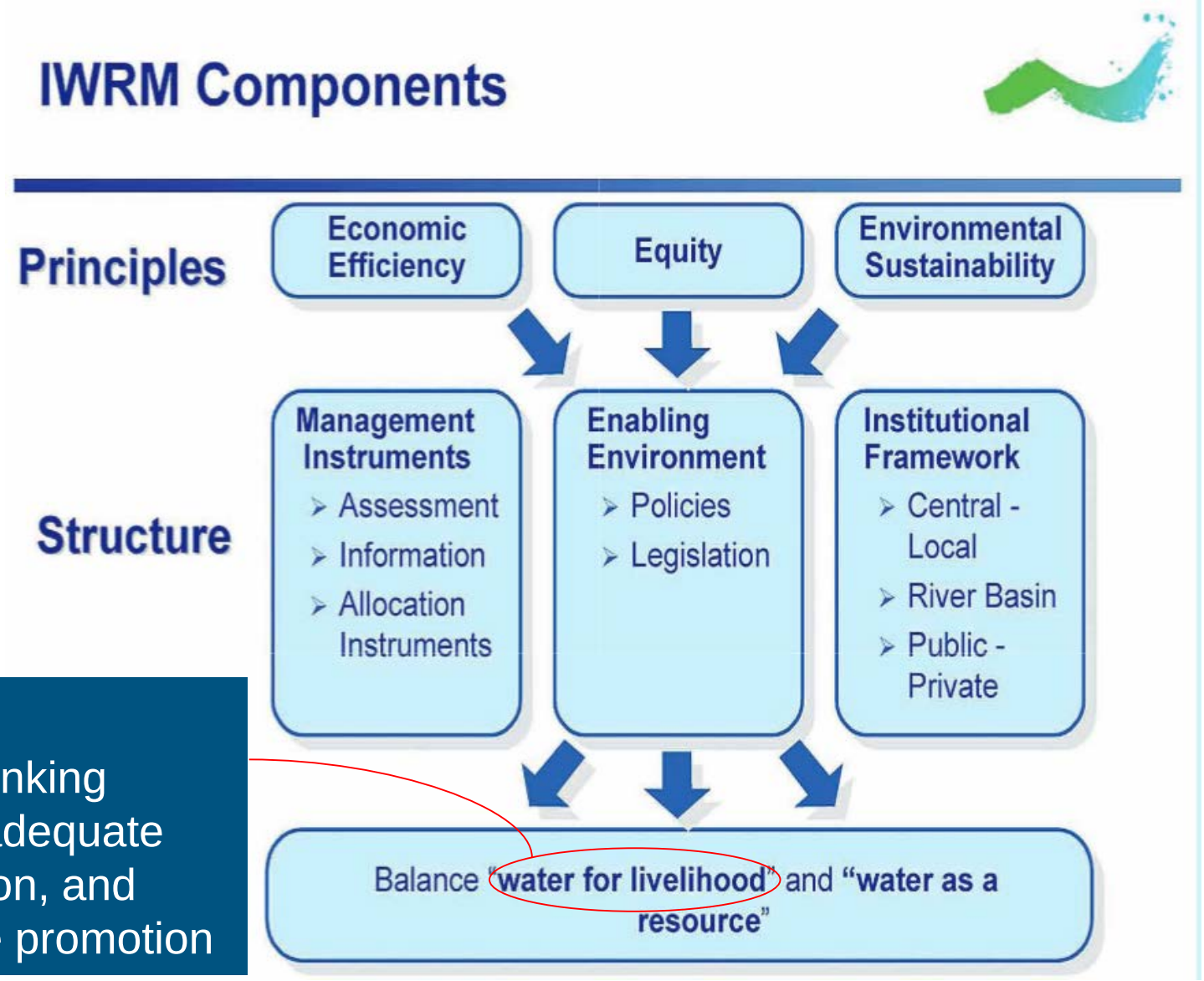

WASH

Safe drinking water, adequate sanitation, and hygiene promotion

Sendai Framework for DRR (SFDRR)

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- SFDRR 2015-30
- International engagement by 187 states.
- UN ISDR as coordination body for DRR

4 pillars:

1. **Understanding** disaster risk;
2. Strengthening disaster **risk governance** to manage disaster risk;
3. **Investing** in disaster risk reduction for resilience;
4. Enhancing disaster **preparedness for effective response**, and to “Build Back Better” in recovery, rehabilitation and reconstruction.

SFDRR for water

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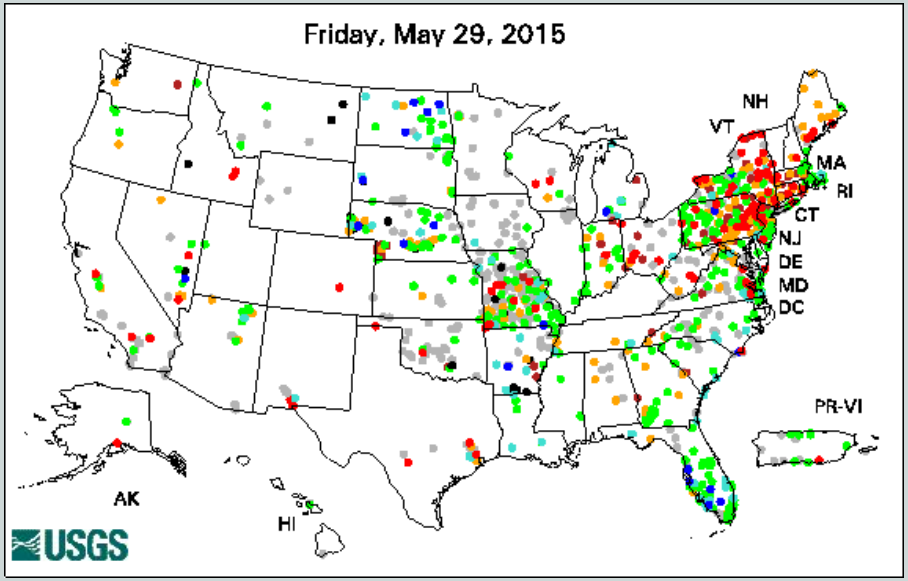
1. **Understanding** disaster risk
   - Multi-hazards risk assessment
   - Understanding, planning and monitoring water resources availability and use (e.g. groundwater monitoring system)



SFDRR for water

2. Strengthening disaster **risk governance** to manage disaster risk
   - Building capacity of institutions and persons for water resources monitoring / management
   - Establishment and strengthening watershed committees to ensure watershed protection against erosion

SFDRR for water

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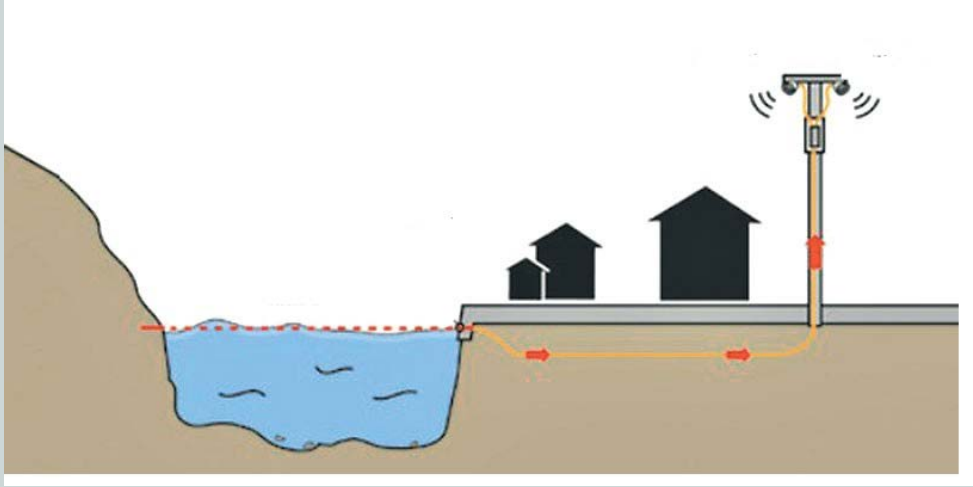
3. **Investing in disaster risk reduction** for resilience
   - Raised latrines and raised tube-wells in flood prone areas
   - Robust / disaster resilient construction of reservoirs
   - Cost-benefit analysis of DRR measures / robust WASH infrastructure

SFDRR for water

4. Enhancing **disaster preparedness for effective response,** and to “Build Back Better” in recovery, rehabilitation and reconstruction
   - Contingency plans by water committees or municipalities
   - Floods early warning system



Risk reduction measures - stair case

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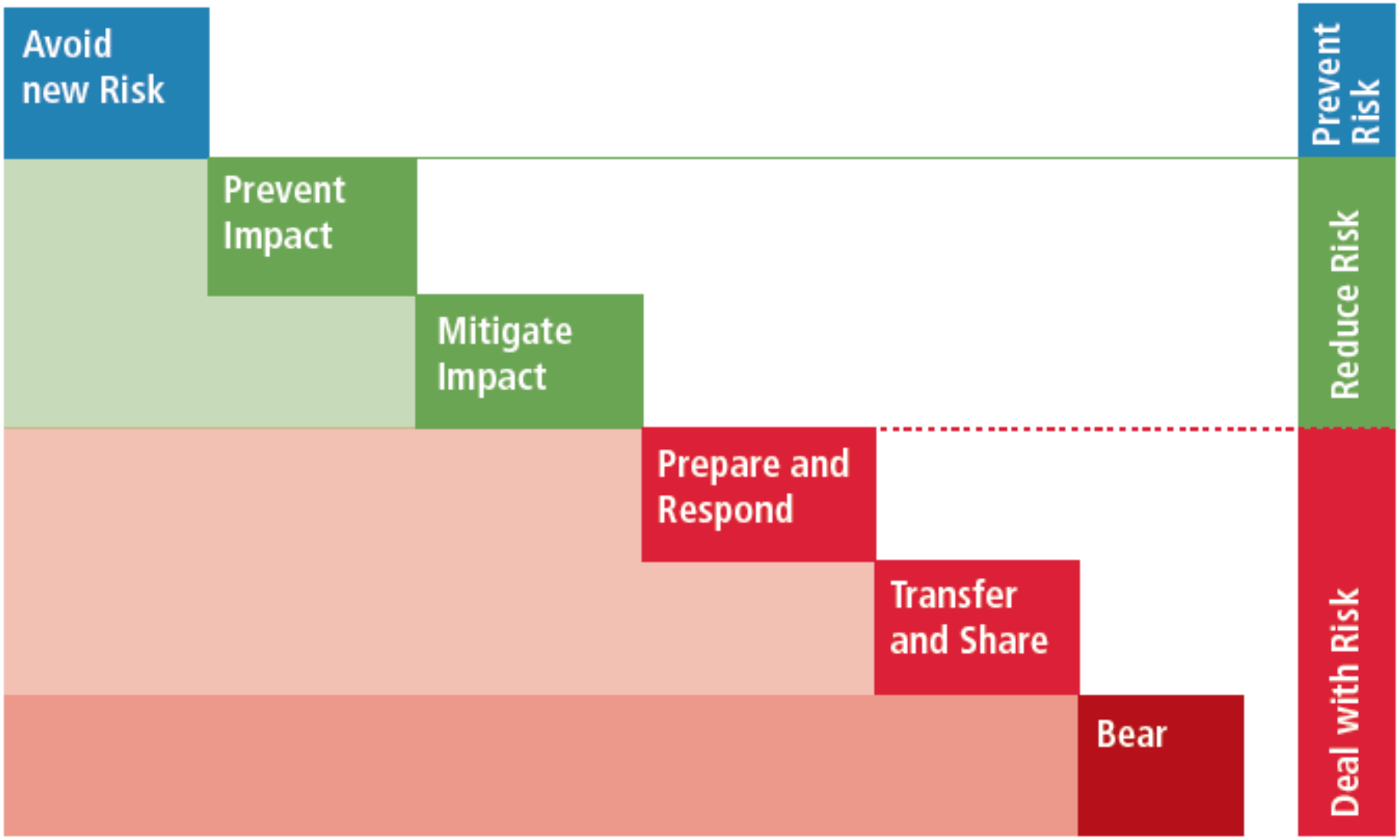

Risk reduction measures - stair case

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Avoid new Risk

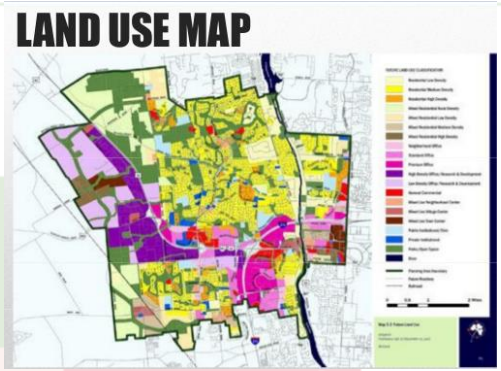
Prevent Risk

Prevent Impact

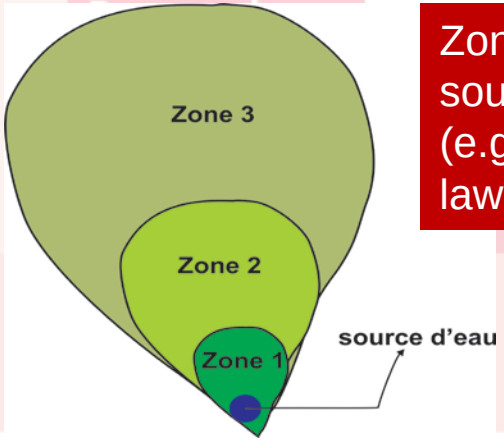
Mitigate Impact

Reduce Risk

- **Water resources management** coupled with **territorial planning** reduces the risk of conflicts or sources drying up
- **Source protection zones**; **Water / Sanitation Safety Plans** reduce the risk of contamination



Prepare and



Zoning as basis for source protection (e.g. municipal by-law Haiti)

Bear

Deal with Risk

Risk reduction measures - stair case

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Avoid new Risk

Prevent Impact

Mitigate Impact

Prepare an Respond

Prevent Risk

Reduce Risk

Deal with Risk

- **Upstream protection walls** to protect springs and infrastructure against landslides
- **Hillside conservation works** (e.g. protection dry stone wall, reforestation) to limit erosion and landslides

Hillside conservation works upstream a spring, Haiti

Risk reduction measures - stair case

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Avoid

Emergency committee in action

Prepare and Respond

Prevent Risk

Reduce Risk

Deal with Risk

Bear

- **Contingency plans** by communities or municipalities
- Establishment and training of emergency committees as sub-groups of water users committees

Risk reduction measures - stair case

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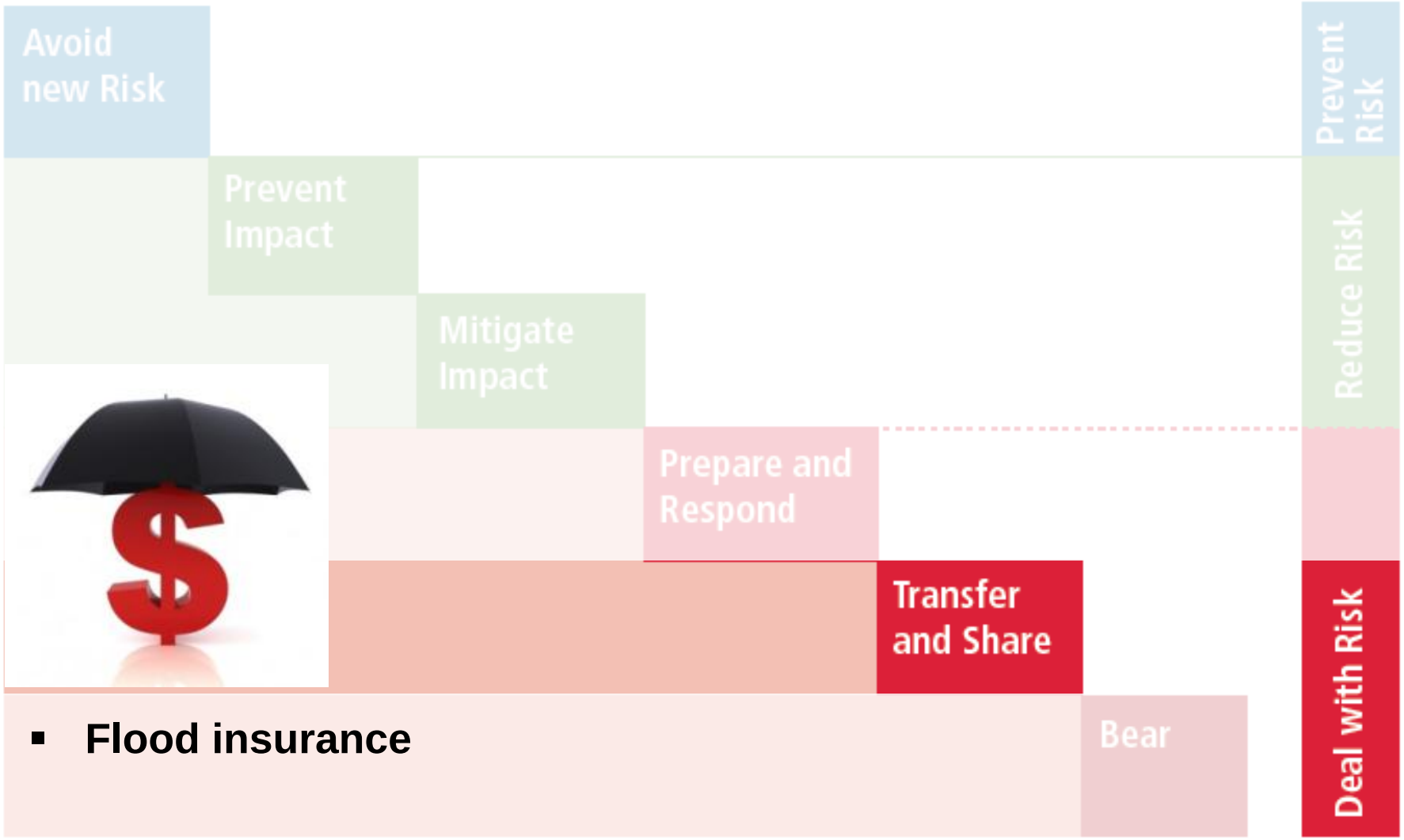

- **Flood insurance**

DRR in water sector: key messages

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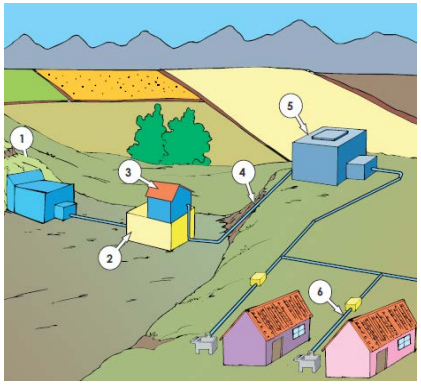
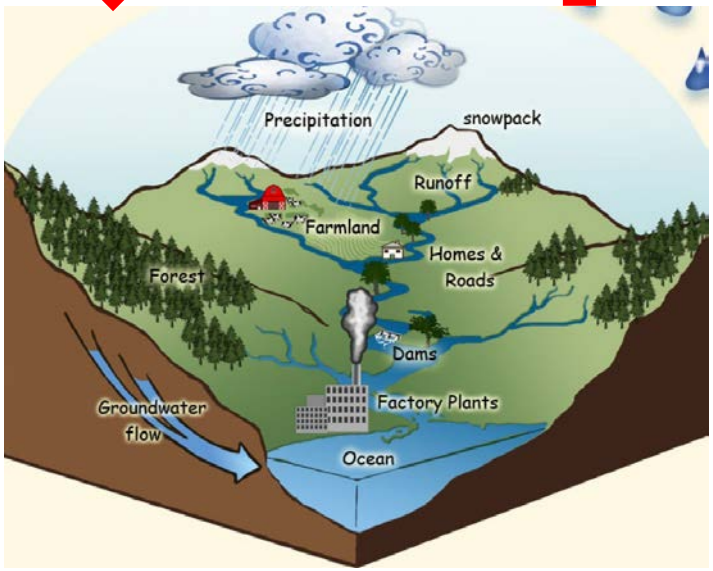
1) Damages and impacts are often beyond infrastructure.

- Different assets and sectors affected

2) Measures

- might be local…
- …though should consider the broader context.

3) Risk analysis as entry point

- Multi-hazard approach
- Start for action planning