



# Managing Watersheds for Resilience

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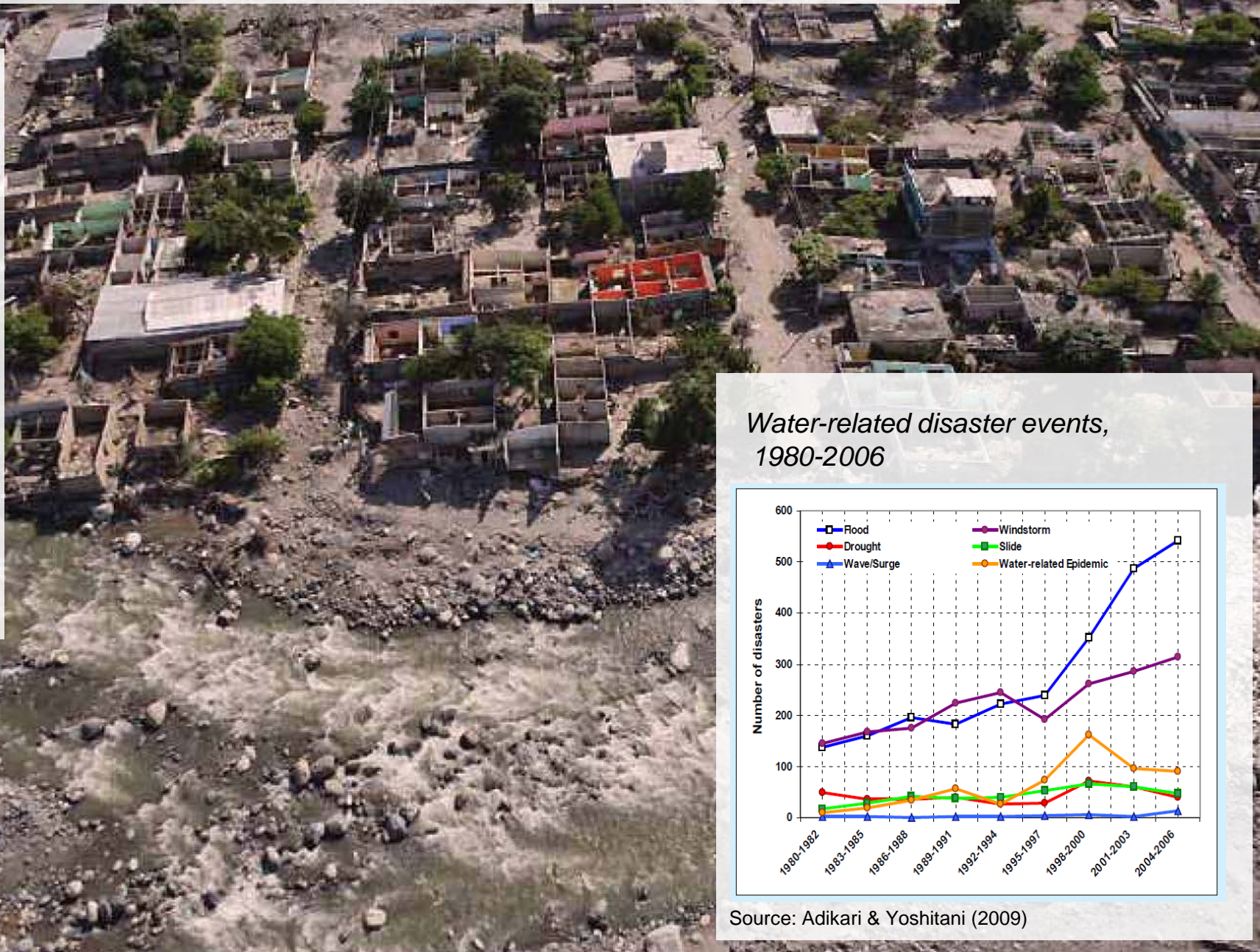


*For 2000-2006*

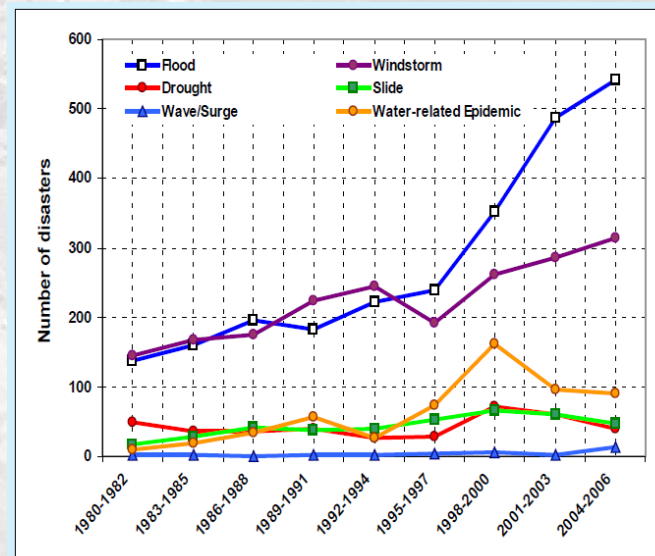
- 2163 water-related disasters
- 290,000 fatalities
- 1.5 bn affected
- \$422 bn damages

*For 1900-2006*

- 90% of 1000 'most-fatal' disasters



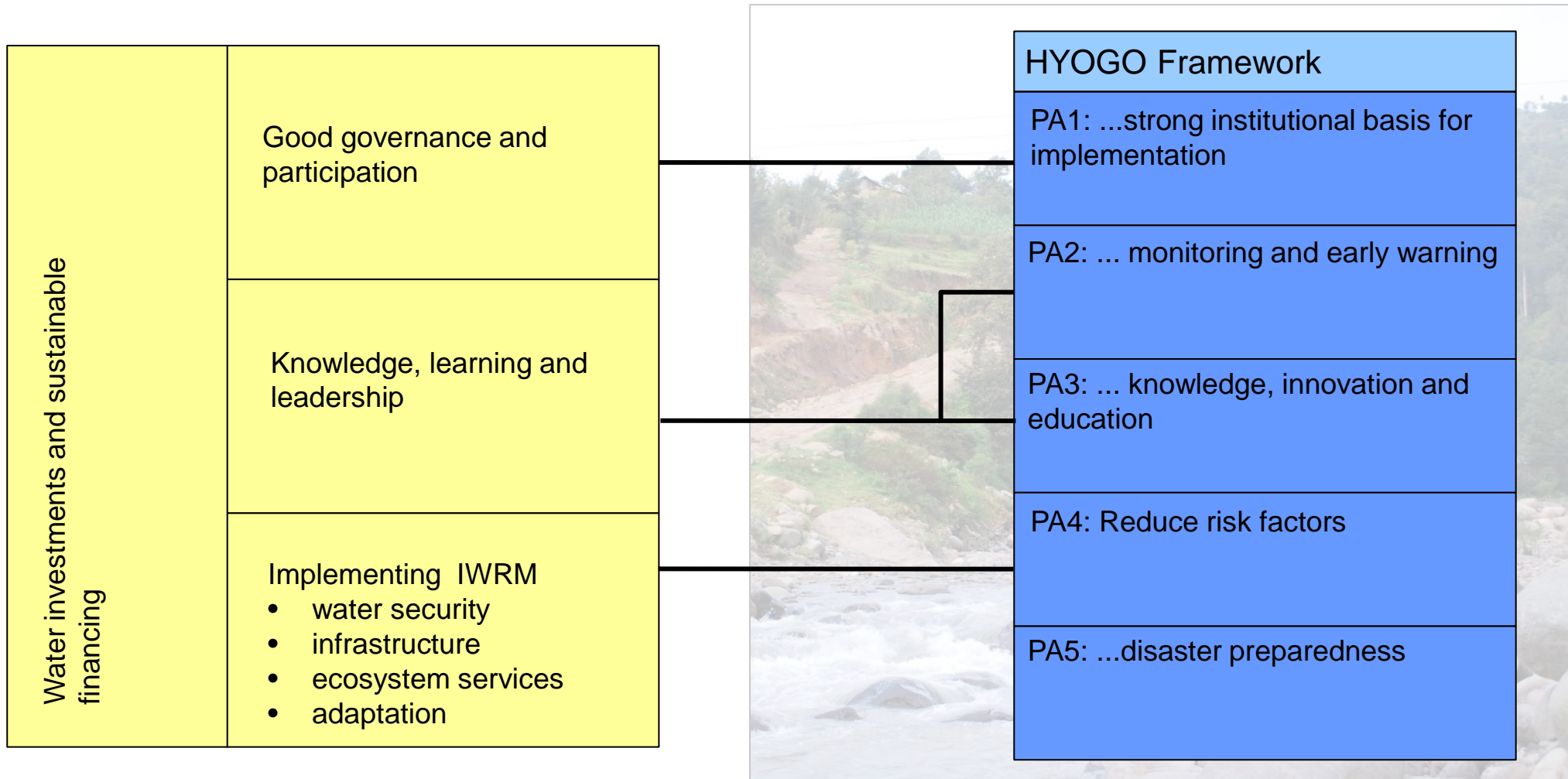
*Water-related disaster events,  
1980-2006*



Source: Adikari & Yoshitani (2009)



# The role of water resource management



# Ecosystem Services: Nature as Infrastructure



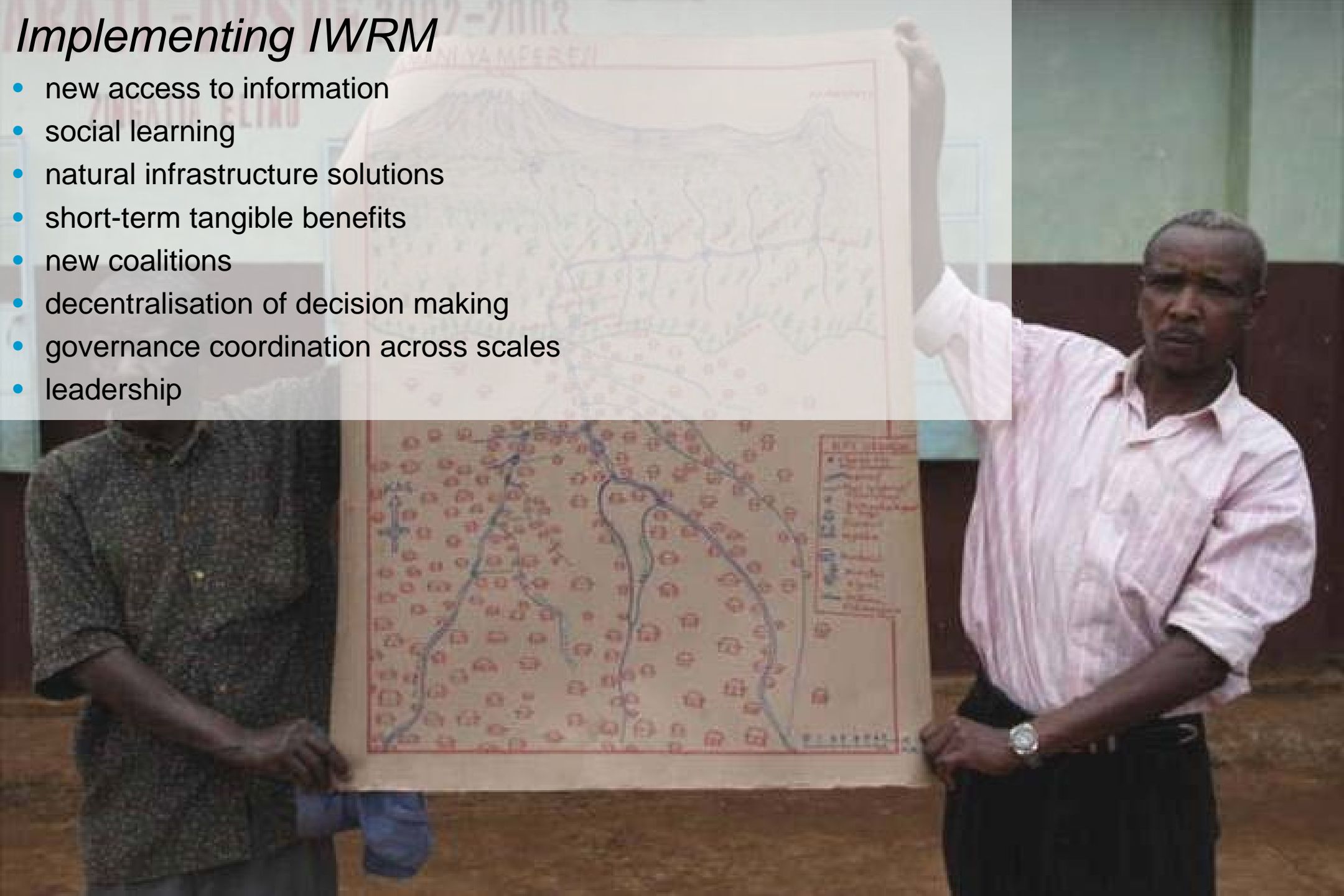
- Built water infrastructure
  - water storage
  - flood defence
  - sea walls
  - protects life and property

- Healthy watersheds
  - store water
  - buffer flows
  - coastal protection
  - water supply
  - support income & enterprise



# *Implementing IWRM*

- new access to information
- social learning
- natural infrastructure solutions
- short-term tangible benefits
- new coalitions
- decentralisation of decision making
- governance coordination across scales
- leadership



# IWRM Implementation: Tacaná, Guatemala

- governance reforms
- watershed restoration
- spring protection
- diversified farming systems
- water supply
- enterprise development
- disaster preparedness
- early warning





# Resilience shift

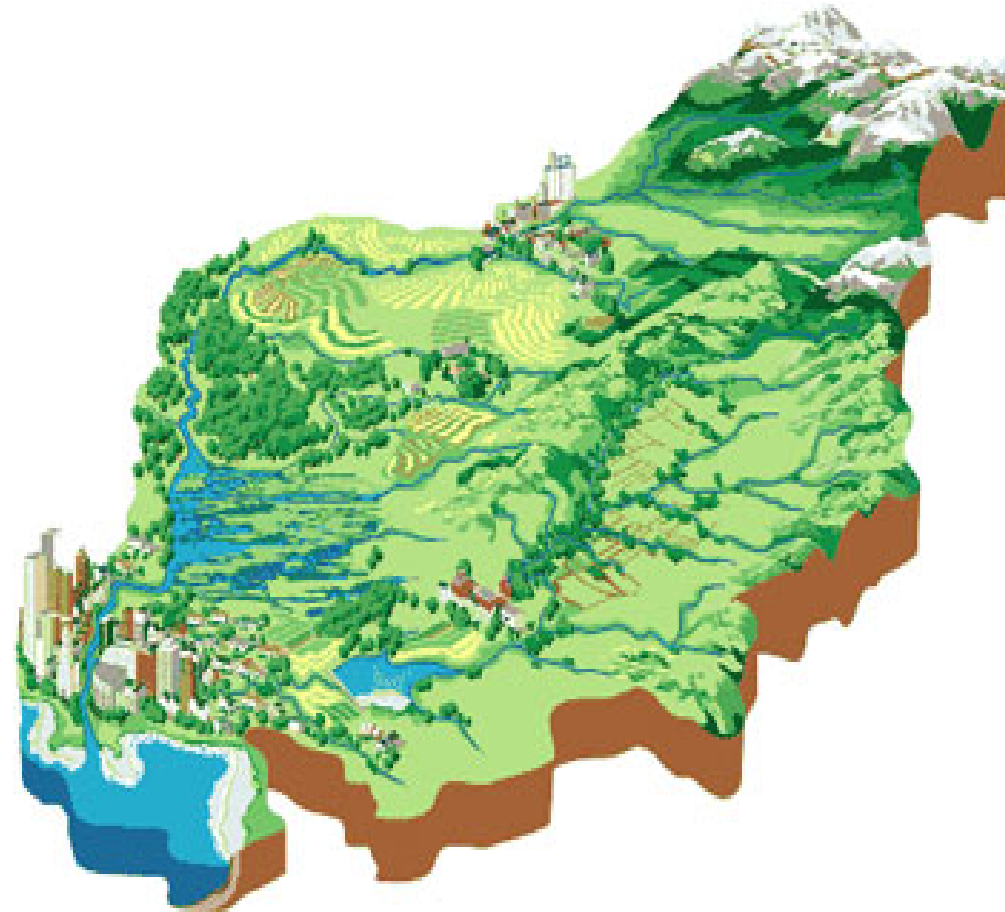
- deforested watersheds
- degraded farming systems
- social upheaval
- downstream disaster
- weak coordination



- local coordination of priorities
- landscape restoration & diversification
- social entrepreneurship
- municipal – provincial liaison
- disaster planning

# Watersheds for Resilience

- synergies between IWRM in DRR
  - in Hyogo implementation
- watersheds as infrastructure
  - built components
  - ecosystem services
- resilient watersheds
  - good WRM builds resilience
- upstream-downstream partnerships
  - watershed management
  - institutions and governance
  - finance: eg. PES, trust funds







## 1. Diversity

economy  
livelihoods  
nature & services

## 2. Sustainable infrastructure & technologies

engineering responses  
natural infrastructure  
sustainable & adaptable

### Climate & disaster resilience

participatory governance  
empowerment  
adaptive institutions

## 3. Self-organisation

knowledge & skills  
climate information  
new adaptive strategies

## 4. Learning



- powerpoint; disaster in the Pacific – new integrated strategy for DRR and CCA, since in the Pacific, these things are linked
- putting disaster risk into water planning; natural and built solutions + commitments from regional agencies to integrate these actions into their workplans... but immediately forgotten at the next strategy... NI not integrated into the right areas where money is flowing – eg where you bring climate finance it at large scale... therefore it is the enabling environment that is the limitation
- not enough learning, not getting pulled together and scaled up and into national development strategies.
- countries not paying attention to what they've committed to, and not paying attention to what is being learnt.