Ecosystem Disaster Risk Reduction and the Impact of Floods

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Natural and Nature-Based Flood Management Methods – **A Green Guide**

Project Overview

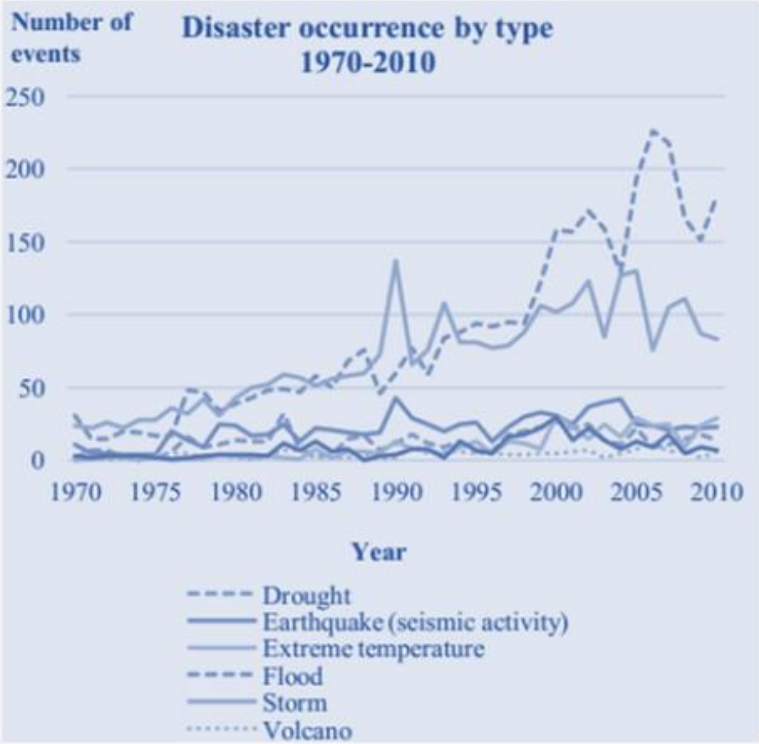
All statements my own and not those of WWFD/US or USAID.

Ecosystems and Disasters

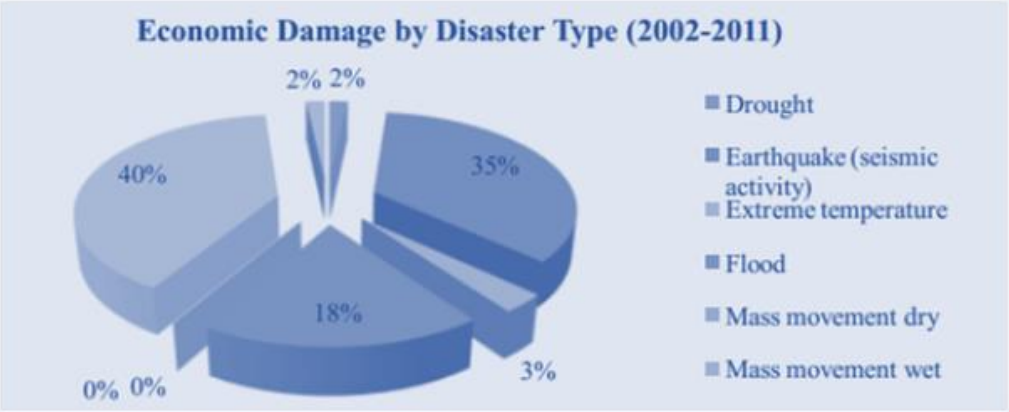
- Growth in interest and use of “ecosystem DRR”
  - Eco DRR is using the environment services (provisioning, regulating, cultural and supporting) to reduce the likelihood or impact of a disaster
- Links to
  - Sustainable development
  - “Semi-sustainable” DRR - DRR interventions which last longer than one disaster cycle
  - Mitigation and impact costs and benefits
- Based on more extensive context analysis than single-option approaches

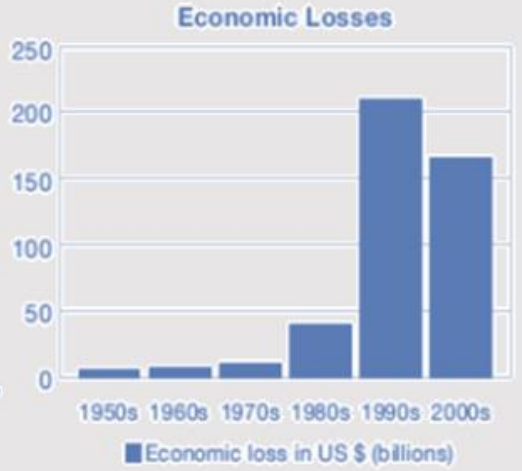
The occurrence of floods is the most frequent among all natural disasters globally

In 2010 alone, **178 million people** were affected by floods. The total losses in exceptional years such as 1998 and 2010 exceeded **$40 billion**.



Number of reported disaster events. Source: based on EM-DAT/CRED





Water-related hazards caused **60%** of total economic losses in last decade

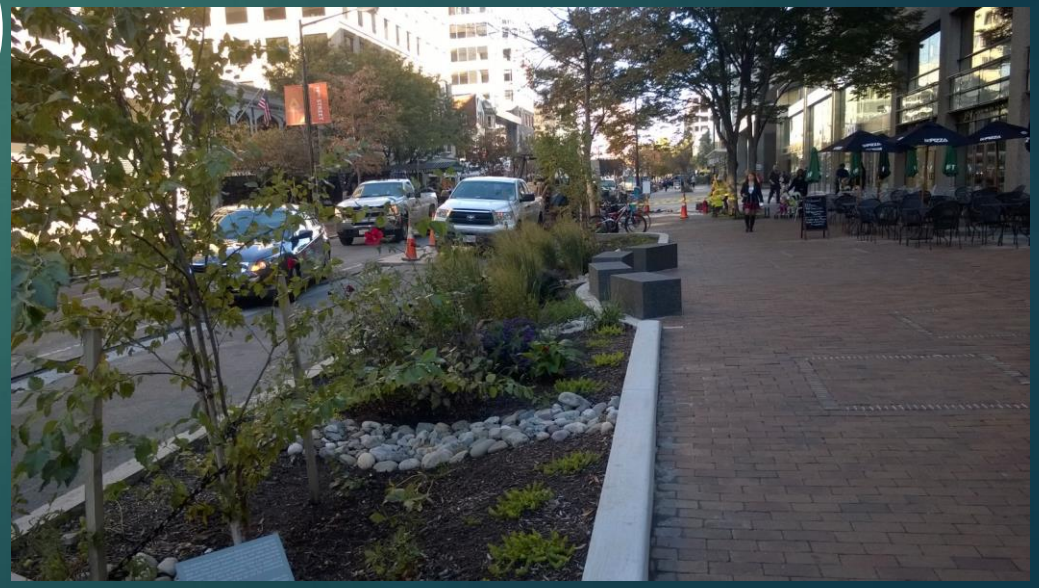
Direct monetary impacts resulting from flood events. Source: based on EM-DAT/CRED

GFDRR

From: **Natural and Nature-Based Flood Management Methods: A Green Guide**, WWF/US

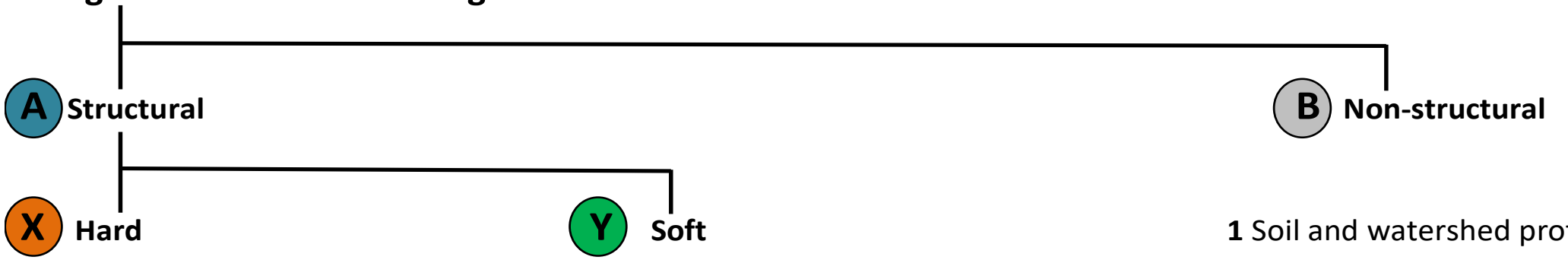
Challenges

- Often slow to have an impact
- Is not often "sexy", not conforming to ideas of "development"
- Can be as much a social process as an engineering one
- Can be confusing (lots of options) and complex – no one quick fix
- Often packaged together with "gray"/concrete options
- Can be hard to sell



A View on the Complexity of Flood Eco DRR

Integrated Flood Risk Management Methods



1 Dams and Reservoirs
2 Barrages and Diversions
3 Constructed wetlands and Polders
4 Levees and Embankments
5 Canal widening and deepening
6 Floodways
7 Pumping
8 Engineered drainage systems
9 Groynes and Revetments
10 Multipurpose infrastructure
11 Warning/evacuation infrastructure

1 Upper watershed restoration measures
2 Soil conservation measures
3 Lower reach wetlands restoration
4 Swales and Infiltration devices
5 Rainwater harvesting and Rain gardens
6 Detention basins and Retention ponds
7 Natural drainage path restoration
8 Riparian vegetation restoration
9 Removal of barriers

1 Soil and watershed protection legislation
2 Land-use planning (regional/community)
3 Building regulations (flood proofing)
4 Regular maintenance of headworks
5 Flood monitoring and warning framework
6 National disaster management framework
7 Flood insurance
8 Crop change and Alternative land-use
9 Community flood committees
10 Community flood awareness programs
11 Community flood preparedness

From: **Natural and Nature-Based Flood Management Methods: A Green Guide**, WWF/US

Risk and Impact

- Assessment of risk should lead decisions on Eco DRR options
- Assessing risk focuses on defining (future) impact – combining a hazard (flood), magnitude, impact, counter-capacities and frequency.
- **But**, – a lot of risk/impact assessment tools and procedures available – from very simple to very complex
- **And** – it proved impractical to set a single risk (impact) assessment process which works everywhere, all the time, serving all needs

Understanding the Conditions of Impact

Instead of focusing on the process of assessing impacts, focused on information which should be available from an assessment:

- Watershed-level data
- Spatial and temporal extent of flooding
- Factors contributing to flooding
- Damage incurred or expected
- Vulnerable groups
- Capacities – human and institutions
- Sources of information

- Emphasis on spatial understanding (maps) and interconnectedness

Community risk mapping/ Photo credit: American Red Cross

Summary

- Ecosystem DRR is increasingly chosen DRR option – for reasons of cost and effectiveness
- More complex level of analysis is needed than single-option DRR
- The **Natural and Nature-Based Flood Management Methods: A Green Guide** opted for a information-driven impact assessment process
- Unclear if this less structured approach will result in more effective results – flood *management* may be more important than understanding impact

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Further information
Environment and Disaster Management Program, WWF/US - http://envirodm.org/