

Ecological Approach for Disaster Risk Reduction : A case for MOBILISE

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INTERNATIONAL UNION FOR CONSERVATION OF NATURE

Increasing frequency

- More than doubled during last 35 years
- Most of the increase came from climate related events
- Geological events have remained steady
- 90% of natural hazards are water-related



EM-DAT: The OFDA/CRED International Disaster Database - www.emdat.be - Universite Catholique de Louvain, Brussels - Belgium

Last two decades

- Disasters killed
 1.35 million
 people worldwide
 from 1996-2015
- Low and middle income countries account for 90% of fatalities
- Economic losses: US\$3.3 trillion from 1980-2014



Statistics from Poverty & Death: Disaster & Mortality, CRED, 2016: p.12

FIGURE 3.2 Disaster losses incurred by the private vs public sectors



Source: Economic and Social Commission for Asia and the Pacific and UNISDR, 2012

Private sector suffered more during key events



Source: Watson et al., 2015

Only 0.4% of the 3.3 trillion US dollars spent on aid was dedicated to disaster risk reduction



Ecosystem Based Disaster Risk Reduction

World is facing complex challenges that cannot be comprehensively addressed through post-disaster response or emergency interventions. The increasing gap between demand for disaster response and available global funding highlights the need for effective disaster risk reduction (UNISDR 1:4 Benefit)

Pre-disaster conditions determine extent of impact and these conditions are affected by climate change effects

"Sustainable management, conservation and restoration of ecosystems to provide services that reduce disaster risk by mitigating hazards and by increasing livelihood resilience." (PEDRR, 2013)

Oceans

- Seagrass
- Corals
- Algae

Coastal

- Sand dunes
- Mangroves
- Salt Marshes
- Sand beaches

Fresh water

- Rivers
- Tanks and Reservoirs
- Villu flood plans
- Flood Plains

Source: Dr. Manori Goonatilake Dept. of Archaeology

Different ecosystems



A case for MOBILISE (in Sri Lanka)

- Re entry of Eco-DRR to provide a sound and sustainable base for modern day DRR
- Win the support of all levels via visualizations and improved what if scenario approaches
- As a vehicle to bring fragmented disaster management players together
- Influence national policy, vision and approaches towards disaster management

Water and Ecosystems: A Landscape Approach



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Sri Lanka Landscape





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Understanding ecosystems



Agriculture, infrastructure and turbidity





Average turbidity load by Hanwella Bridge Source: Mallawatantri and Samarathunga (IUCN, 2016)



Aranayake – Landslide 16th May 2016 (Mr. Simal Samansiri)



PRE IMAGE March 2016

POST IMAGE June 2016





Vegetation management in drylands improves drought resilience



Mangroves, saltmarshes and sand dunes buffer from winds, sandstorms, storm surges









Protected areas in risk reduction



- Nearly 30% land area and 1% coastal and marine area under protected areas
- Protected areas reduce flooding by absorbing water and reducing storm surges
- Retain natural vegetation that helps to stabilize soil (landslides)
- Slow the movement and extent of damage once slippage is underway
- Human-Elephant Conflict
 Prevention by less fragmentation



Socio-Economics of Ecosystems leading to financing and policy

- Water (drinking, irrigation and power generation)
- Carbon gains and
- Biodiversity (pollination and other benefits..)
- Timber, Non timber, Fuel wood, Grazing
- Recreational and tourism value



Ecosystem	Hazard	Hazard mitigation value (US\$)
Coral reefs (global)	coastal	189,000 per hectare/year
Coral reefs (Caribbean)	coastal	700,000– 2.2 billion per year (total value)
Coastal wetlands (United States)	hurricane	8,240 per hectare/year
Coastal wetlands (United States)	storms	23.2 billion per year (total value).
Luzňice floodplain (Czech Republic)	floods	11,788 per hectare/year
Muthurajawela marsh (Sri Lanka)	flood	5 million per year (total value); 1,750 per hectare/year
Coastal ecosystems (Catalonia,	disturbance	77,420 per hectare/year
Spain)	protection,	
	including storms	
Mountain forests (Switzerland)	avalanche	up to 170,000 per hectare/year in
		high-value built up areas

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Climate influence in Sri Lanka : Rainfall

Projected Precipitation Changes over Sri Lanka by PRECIS RCM in combination with ECHAM4 GCM for B2 Scenario



Climate influence in Sri Lanka: Temperature

Predicted Temprature change over Sri Lanka by PRECIS RCM in combination with ECHAM4 GCM for B2 Scenario











Strengthening Eco-DRR with information

Disaster Risk Reduction and

IUCN

preparedness

- Vegetation for stabilizing slopes;
- Wetlands & floodplains to control floods;
- Mosaic landscape for fire management;
- Vegetation management for drought resilience;
- Mangroves, saltmarshes and sand dunes as buffers from i.e. storm surges;
- Provide climate change mitigation.

- Integrated Coastal Zone Management;
- Integrated Water Resource Management (IWRM);
- Integrated Fire Management;
- Protected Area Management;
- Community-based Natural Resource Management

Nature Based Solutions (NBS) as a sustainable and resilient approach







Adapted from Balian E., Eggermont H. & Le Roux X. 2014. Outputs of the Strategic Foresight workshop "Nature-Based Solutions in a BiodivERsA context", Brussels June 11-12 2014. BiodivERsA report, 45 pp.



Eco approaches and traditional engineering on multiple benefits in risk reduction



Understanding better to manage better



Data (SDI)



Field data collection



Maps & Info



Environment impact/Risk assessments, risk modelling, change detection, visualizations, policy dialogues with better communication tools



Key areas for MOBILISE

- Education and awareness on ecosystem processes (soilwater-climate etc.) to illustrate the relationships of ecosystems and potential DRR
- Socio-economic modelling and simplified explanations on the advantage of investing on ecosystem based DRR
- Influencing the way we think on engineered solutions vs ecosystem conservation benefits (both are needed)
- Policy dialogue to shift and target investments to reduce natural disasters as well as to address slow-onset disasters



Towards a safer Sri Lanka Thank you!