

Advancing the Sendai Framework through Ecosystem-based Disaster Risk Reduction



Road to Cancun &
beyond

© UN Environment: border zone between Haiti and Dom. Republic

PEDRR

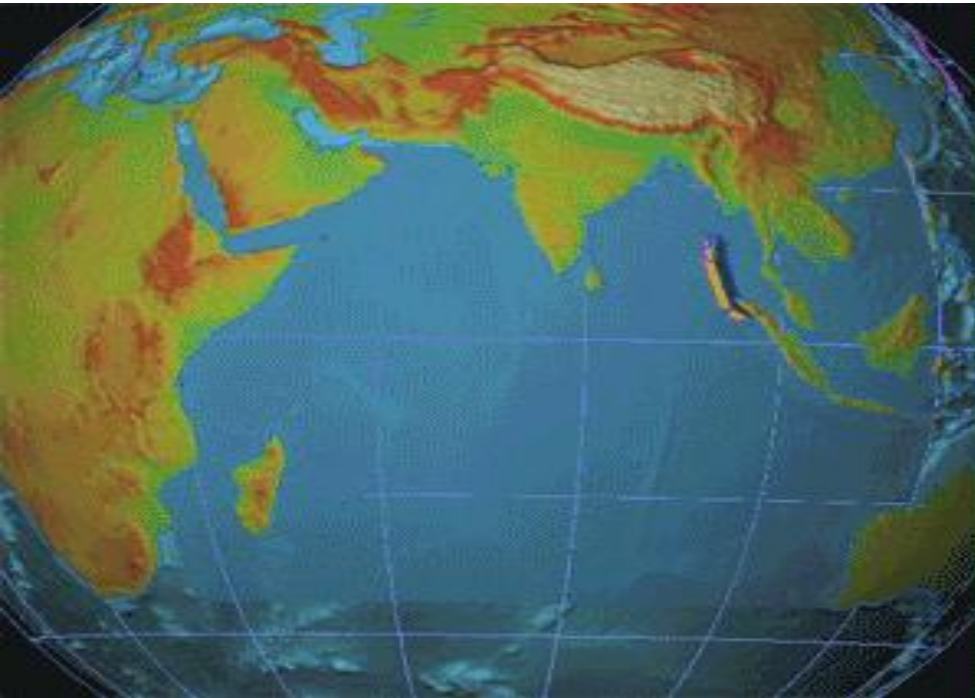
Ecosystems for Adaptation
and Disaster Risk Reduction



Presentation Outline

1. Partnership for Environment and Disaster Risk Reduction
2. Ecosystems and the Sendai Framework
3. Lessons from the field
4. Advancing implementation of the Sendai Framework and the 2030 Agenda

Indian Ocean Tsunami (2004)

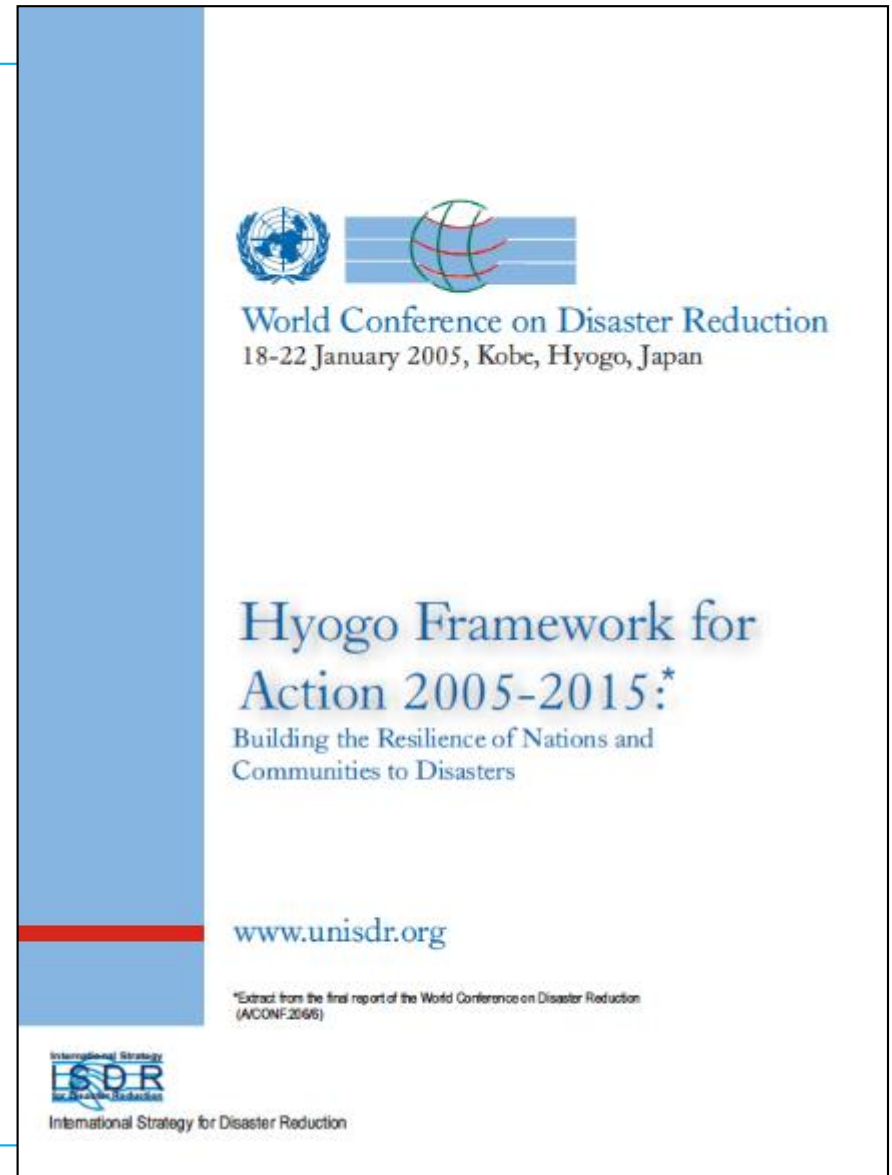


- 26 December – 9.1 magnitude earthquake caused deadliest tsunami in recorded history, with waves up to 30 m high
 - Killed over 230,000 people, displaced 1.7 million people, affected 15 countries
-

One month later....

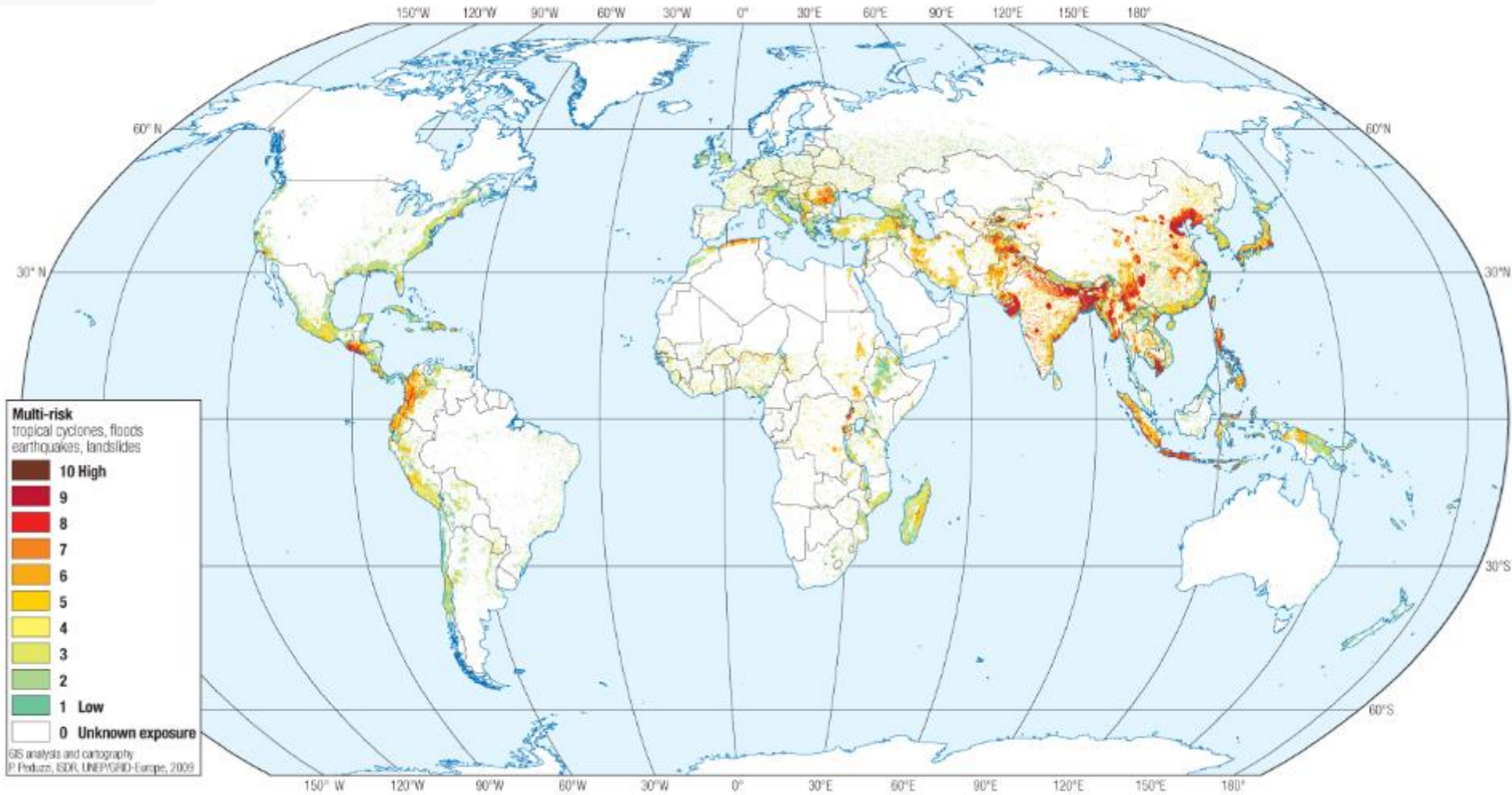
Hyogo Framework for Action (HFA) –
the first global
framework on DRR

Endorsed by 168
countries

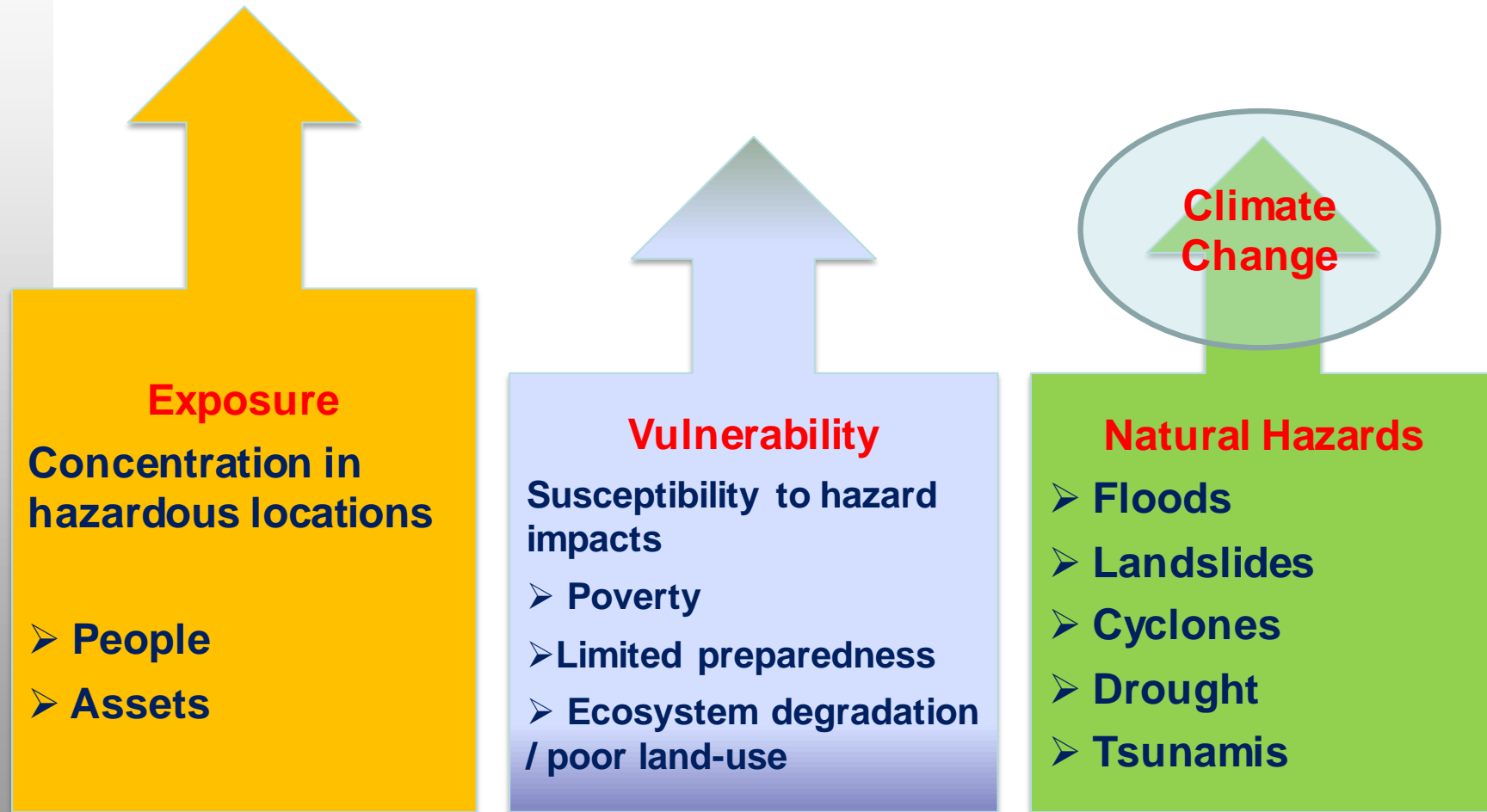


Increasing disaster risk globally ...Why?

Multiple Risk



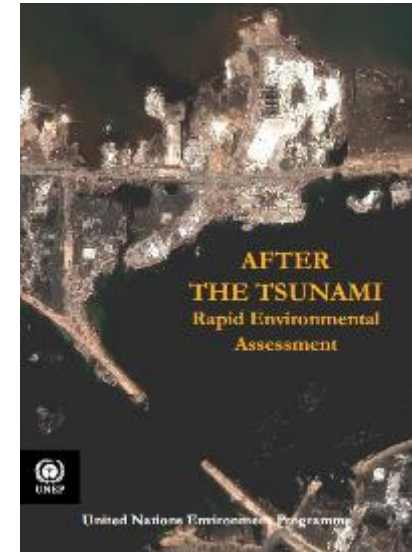
DISASTER RISK



Rooted in unsustainable development

2005

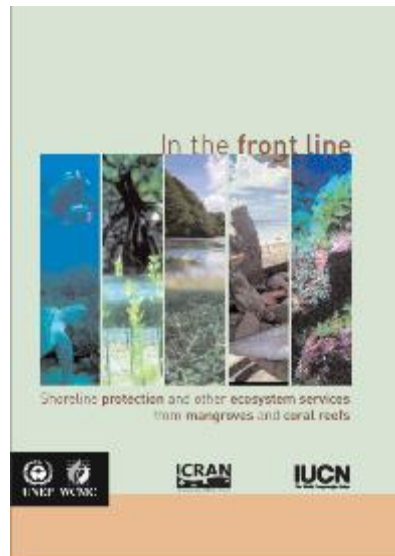
Healthy, well-managed ecosystems can reduce disaster risk



2006



2006



2007



2009



The Partnership for Environment and Disaster Risk Reduction



Asian Disaster Preparedness Center (ADPC) • Council of Europe • Global Fire Monitoring Center (GFMC) • Global Risk Forum • International Union for the Conservation of Nature (IUCN) • ProAct Network • Stockholm Environment Institute (SEI) • The Nature Conservancy (TNC) • UN International Strategy for Disaster Reduction (UN/ISDR) • United Nations Development Programme (UNDP) • United Nations Educational, Scientific and Cultural Organization (UNESCO) • United Nations Environment Programme (UNEP) • United Nations University-Institute for Environment and Human Security (UNU-EHS) • Asian University Network of Environment and Disaster Risk Reduction (AUEDM) • Helvetas Swiss Intercooperation • Wetlands International • World Wide Fund for Nature (WWF) • Convention on Biological Diversity (CBD) • Ramsar Convention on Wetlands • World Business Council for Sustainable Development (WBCSD) • International Institute for Sustainable Development (IISD) • Global Network of Civil Society Organisations for Disaster Reduction (GNDR)

www.pedrr.org

Environment and Disaster linkages



**Disasters
cause or aggravate
environmental degradation
e.g. hurricanes damage coral
reefs**



**Environmental degradation
causes or aggravates disasters
e.g. Deforestation causes
mudflows or landslides**

Healthy, well-managed ecosystems as solutions in disaster risk reduction



Ecosystem-based Disaster Risk Reduction

Sustainable management, conservation and restoration of ecosystems as part of a strategy to reduce people's vulnerability and increase their resilience to natural hazards and climate change.

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Ecosystems for Adaptation
and Disaster Risk Reduction

Protection Forests in Switzerland



150 million Swiss francs per year in forest management

5 to 10 times less costly than engineered measures

(Wehrli, A and L. Dorren, 2013).

© M. Estrella/UNEP

Davos, Switzerland

Coastal forest protection in Japan



300-400 year old coastal forest established to protect agricultural land and community in a hazardous bay, Oki Bay (Kochi Prefecture), Japan

Drought and livelihood resilience strategies in Burkina Faso and Niger



Local farming techniques involved digging shallow pits to improve soil fertility



On-farm tree planting

Applying existing Ecosystem Management principles and tools/approaches

**Integrated Coastal
Zone Management
(ICZM)**

**Integrated
Watershed
Management**

**Integrated Fire
Management
(IFM)**

**Protected Area
Management**

**Community-based
Natural Resource
Management
(CBNRM)**

**Environmental
Impact
Assessments**

Promoting the role of ecosystems in disaster risk reduction



PEDRR's priority areas of work:

1. Advancing **science and knowledge**
2. Strengthening **capacities for implementation and up-scaling**
3. Policy **advocacy and mainstreaming**

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Ecosystems for Adaptation
and Disaster Risk Reduction

PEDRR

Ecosystems for Adaptation and Disaster Risk Reduction

Ecosystems for Adaptation and Disaster Risk Reduction

Satishwan-Ramiz, K., McAdams, D.G., Hsu, S.F., Bertie Zubaidi, L.K., Ford, M., Chatterjee, T., Brown, H. & Gormer, A. L. University of Lausanne, Switzerland, 2, Asia-national university, Singapore college, 3, United Nations University programme, Switzerland

The currently organized Global Framework for the Tenth UN Conference (UNF10) will present the way for a positioned emphasis on ecosystem-based disaster risk reduction (EB-DRR). Citizens and governments will be seeking guidance on how to put low-carbon objectives into action. The objective of this global framework review is to map the scientific underpinnings, methods for quantification and research gaps related to EB-DRR findings are expected to advance the evidence base on the DRB and identify priority areas for further research.

[illegible]

Fig. 3. The "b-bled" discarded publications as they were neither rechecked, nor OIR-retained (as 871).

[illegible]

Thomson, R. and Price (1977) [see also (1978)]

Fig. 1a. Article related to 800-ORP ($n=110$); Fig. 1b. Small wave1, 800-ORP sub- or cross-curling themes ($n=94$)

[illegible]

Fig. 4a Left: Word cloud based on Donald article titles. Right: Word cloud for Eco-DBN related

The authors followed a systematic and analytical search protocol. During the initial searches on a clearly defined protocol in Web of Knowledge (provided a template) included the first day of the search. The second day required reaching through all titles and many of the abstracts in order to tag and place each article in a broad area category and a sub-category. This step necessitated a more detailed analysis of the abstracts and made it difficult to include an article in the "Yes-200" list or the "No-200" list. Next, a detailed analysis of the abstracts and the second day and analysis of the cross-citing articles, further categorizations according to geographic areas and disciplines, with a secondary attempt placed the publication in 1995. A more thorough classification with the thematic placed on the day for each category of articles.

Acknowledgements

We especially thank the EBC Challenge for funding, how students to establish the certificate and mental literature work. Many thanks to the team Edwina, UNIP for continued support and guidance, to all the Master-Thesis-Editors for the layout and development of word clouds and for useful feedback from reviewer at UNIP online, University of Cologne, Germany.

Mason R, Donald N, Liu Q, Reid H, Graham A, Gribble J (2011) *Fluorescence: increasing the evidence for the effectiveness of computer-based approaches to adaptation*. Cambridge: www.adaptation-uk.org/.

The Role of Ecosystems in Disaster Risk Reduction

EDITED BY FABRICE G. RENAUD,
KAREN SUDMEIER-RIEUX AND MARISOL ESTRELLA

Advances in Natural and Technological Hazards Research

Fabrice Renaud
Karen Sudmeier-Rieux
Marisol Estrella
Udo Nehren *Editors*

WITH A FOREWORD BY MARC

Ecosystem-Based Disaster Risk Reduction and Adaptation in Practice

Revealing Risk.
Redefining
Development.

GAR

2011

Global Administrative Reports
on Climate Risk, 2012-2013

 Springer



Bogor - Indonesia - 16 - 18 June 2014

International Science-Policy WORKSHOP



Researchers, policy makers and practitioners brought together

PEDRR
Ecosystems for Adaptation
and Disaster Risk Reduction



CNRD
Center for Natural Resources
and Development

The Nature Conservancy
Protecting nature. Preserving life.



DAAD Deutscher Akademischer Austausch Dienst
German Academic Exchange Service



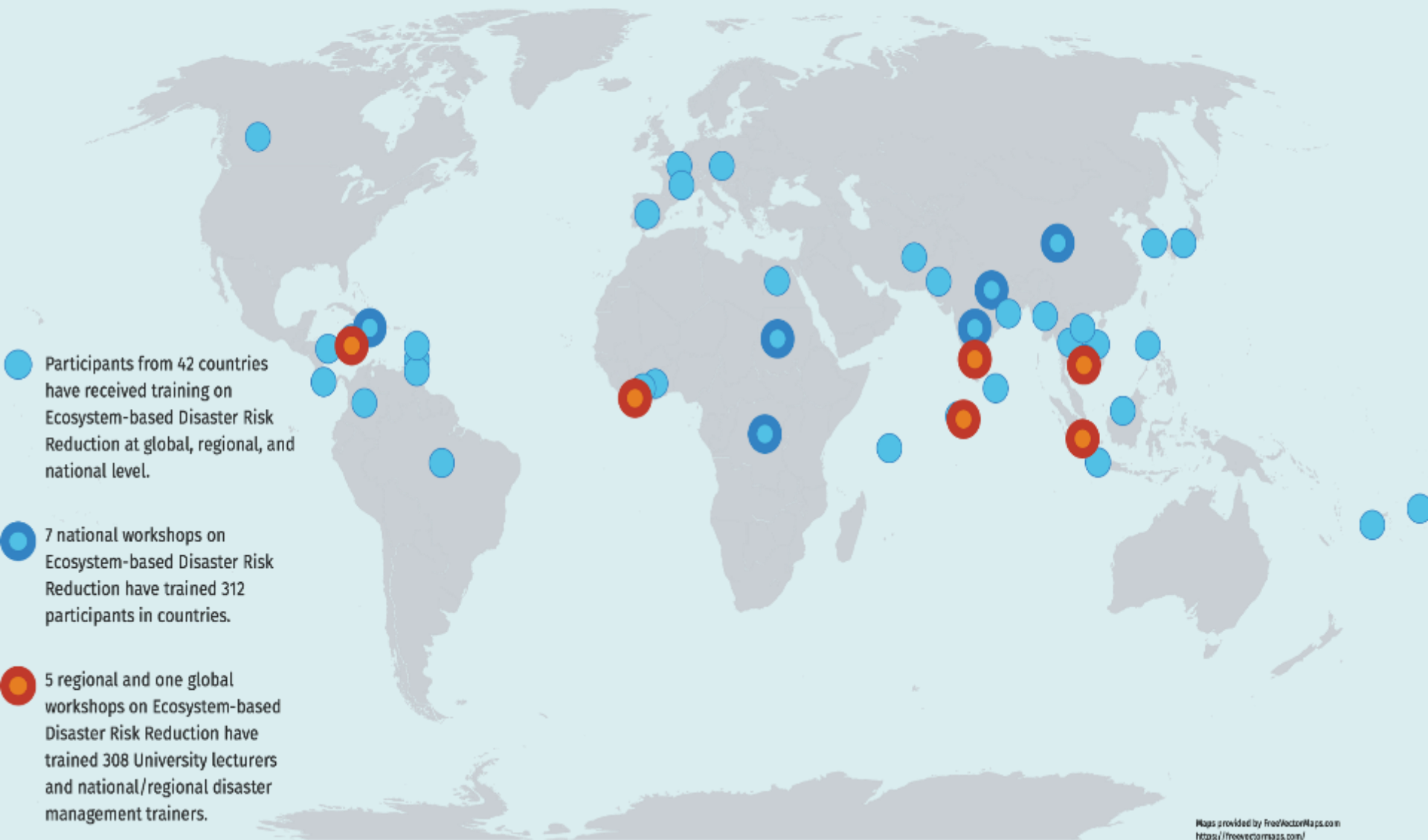
Enhancing Capacities for implementation and up-scaling



- National Training Course
- Graduate-level Course
- Regional & Global Trainings of Instructors
- Global University Network



UNEP Global Efforts to Advance Ecosystem-based Approaches to Disaster Risk Reduction 2012-2016



The first Massive Open Online Course (MOOC) on Disasters and Ecosystems

DISASTERS AND
ECOSYSTEMS:
RESILIENCE IN A CHANGING CLIMATE

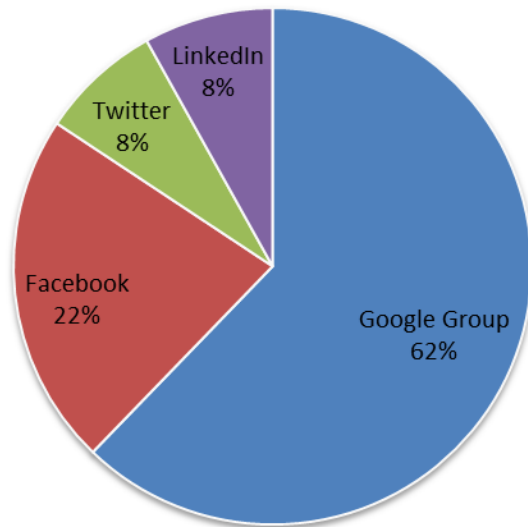


- 12,000 + enrolled from 183 countries
- Facebook created by students with over 13,000+ followers
- Watch out for 2nd run in 2017!

Visit: www.themooc.net

Eco-DRR Community-of-Practice

Distribution of Online Media Audience



PEDRR Secretariat oversees:

- Weekly Newsletter – 5,582 subscribers
- Facebook – 2,294 page likes
- Twitter – 873 Followers
- LinkedIn Group – 1,525 members
- Youtube channel – 14,308 views
- Website

Policy advocacy and mainstreaming



- Sendai Framework
- Paris Agreement on Climate Change
- Sustainable Development Goals (2, 6, 11, 13, 14, 15)
- Convention on Biological Diversity
- Ramsar Convention on Wetlands

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Ecosystems for Adaptation
and Disaster Risk Reduction

Ecosystems and the Sendai Framework for Disaster Risk Reduction (2015-2030)

- Environment as a cross-cutting issue in DRR
- Role of ecosystems in risk assessments (Priority 1)
- Ecosystems management in risk governance (Priority 2)
- Sustainable ecosystems management for building resilience to disasters and climate change (Priority 3)



Credit: Sudmeier- Rieux



©IUCN Thailand

Ecosystems and the Sendai Framework for Disaster Risk Reduction (2015-2030)

- mainstreaming disaster risk assessments into management of mountains, rivers, coastal flood plain areas, drylands, wetlands;
- integrating disaster risk reduction in policies related to environment, natural resource management and biodiversity;
- active engagement of environmental managers in National Platforms on DRR and in implementation of disaster risk reduction strategies and plans;
- use of Environmental Impact Assessments/Strategic Environmental Assessments as important tools to achieve risk-sensitive public and private investments.



Ecosystem-based Disaster Risk Reduction Field Projects (2013-2016)

Lessons from DR Congo, Haiti, Afghanistan, and Sudan

Marisol Estrella/ 17 May 2017, Geneva

In each of the four countries, the project delivered:

- Integrated risk and ecosystem baseline assessments
- Ecosystem-based measures / field interventions
- Tangible livelihood benefits to communities
- Local / national capacity building and hands-on learning
- Strengthened partnerships and new collaborations
- Mainstreaming Eco-DRR into national policies



Ridge-to-reef approach for building coastal resilience in Port-Salut, Haiti



UN
environment



Ecosystem in focus: coastal and marine habitat

Target: 90 fishermen, 20 farmers and 300 households

Location: Port-Salut municipality, South Department

Main hazards targeted: Flooding and storm surge

Approach:
Sustainable and resilient coastal zone management, through ridge-to-reef approach

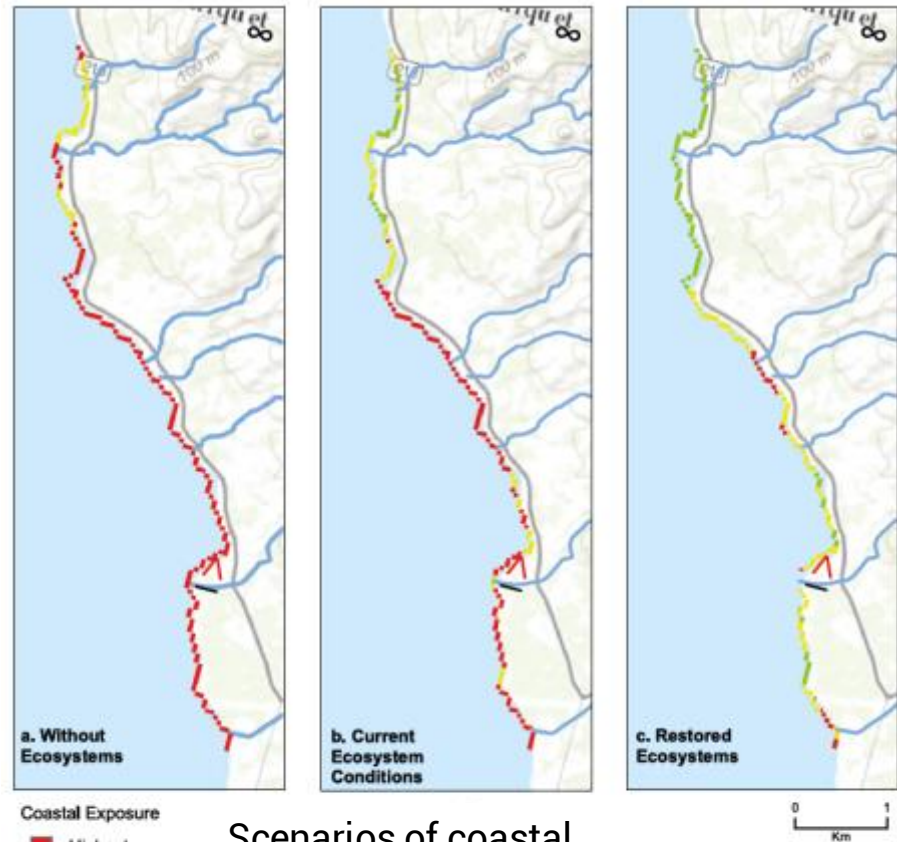
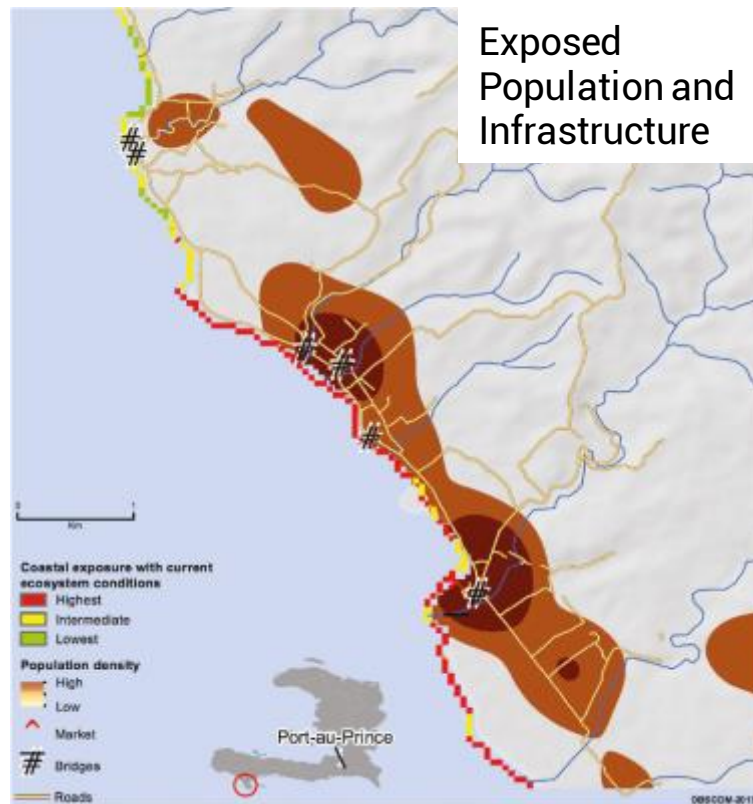
Sustainable vetiver production with terracing helps to reduce heavy soil losses, mitigate flooding downstream and support livelihoods



AFTER

Baseline assessments and GIS modelling

- Field surveys of marine and terrestrial ecosystems
- GIS mapping and modelling



Scenarios of coastal exposure to flooding and storm surge using InVEST Coastal Vulnerability Model

OBSCOM 2015

Highlights of interventions

- **Tree nursery established producing 1 37,000 seedlings** of coastal and riparian species and fruit trees, directly benefiting 200 households
- **141 ha of reforestation** in areas exposed to coastal hazards and flooding
- **Boat repair and fleet improvement** (7 motors, 19 sailboats, 15 sails) enabling fishermen to fish further out in the sea
- **Municipal cash for work to collect solid waste**
- **Disaster preparedness plan** in place and safe shelters identified for Port Salut fishermen



Coastal species nursery



Planted mangroves along Trouillac river mouth

Catchment-based approach for slope stability and flood control in Afghanistan



Ecosystem in focus: mountains, forests, rangelands

Target: 7 villages in 3 village clusters

Location: Bamyan Province, Afghanistan

Main hazards targeted: Harsh winters and floods

Approach:

- Risk-sensitive land-use planning in the Koh-e Baba watershed

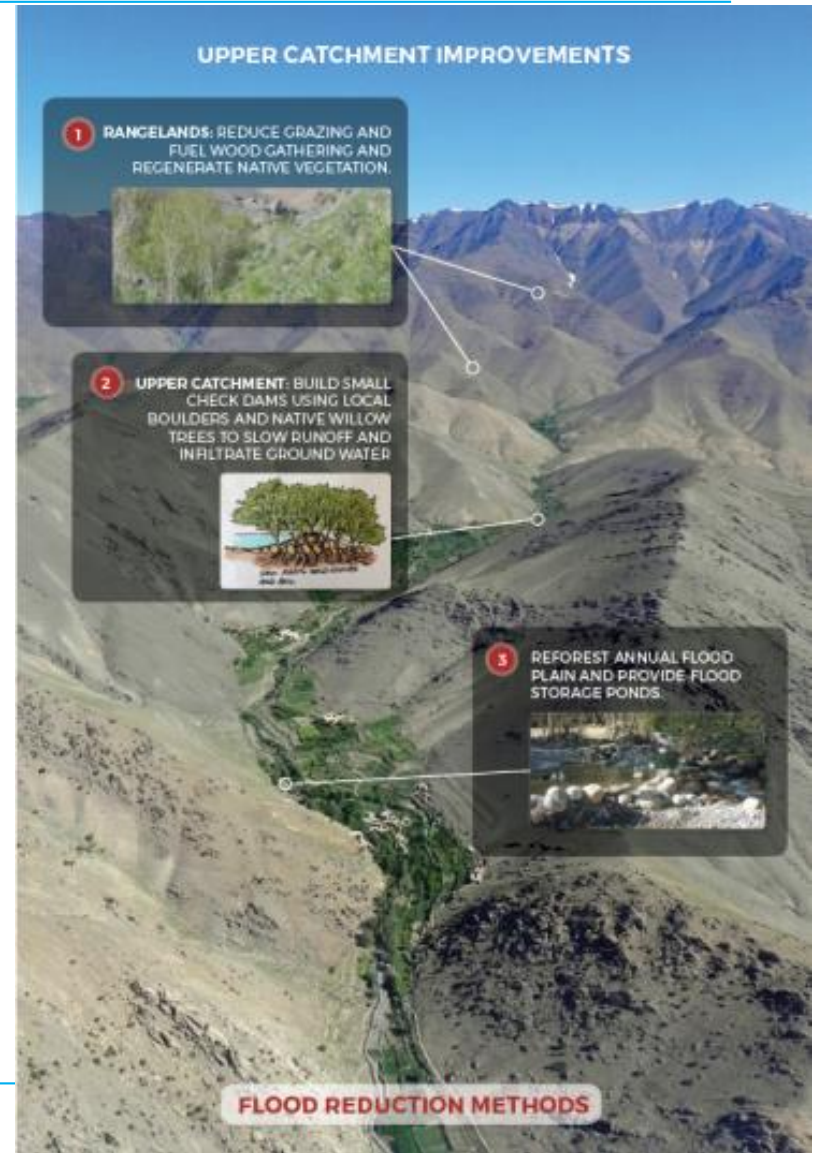
Reforestation of eroded, flood prone slopes

BEFORE

AFTER

Integrating Eco-DRR in the Shah Foladi Protected Area Management Plan

Pedestrian access trails are planned in the landscape plan of Koh-e Baba Mountains to connect valleys and reduce isolation during winter when the main roads are blocked from snowfall and avalanches.



National level advocacy

- Eco-DRR was promoted in climate change adaptation and humanitarian activities in the country
- Eco-DRR being promoted in National Biodiversity Action Plans

Second conference on
building resilience
through Eco-DRR in
Afghanistan,
held in Bamyán province
(Sept 2015)



Integrated watershed management for flood risk reduction and improved water quality in DR Congo



Ecosystem in focus: river basin, high rainfall savanna with gallery forests

Target: 1,400 inhabitants in 10 villages (zones of the Lukaya watershed)

Location: Lukaya River Basin, outside of capital city Kinshasa

Main hazards targeted: floods and gully erosion

Approach: Linking downstream and upstream communities through risk-sensitive, watershed management in the Lukaya river basin

Gully erosion control downstream through revegetation



BEFORE



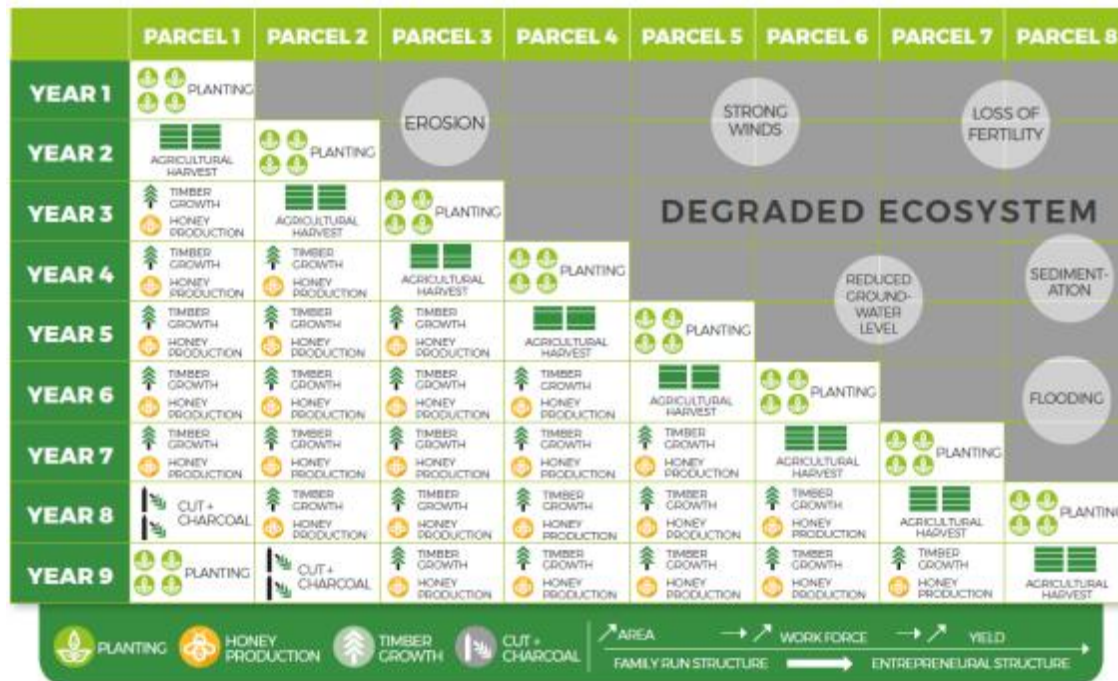
AFTER

Community agroforestry system established on 15 ha in Ntampa

YEAR	Revenue from 1 ha of agroforestry
YEAR 1	3,000 USD from production of 100 bags of charcoal from 6,250 USD from harvest of 2,500 kg of niébè
YEAR 2	9,615 USD from 6,410 kg of cassava
YEAR 3-7	7,000 USD from 1,000 L of honey
YEAR 8	35,000 USD from 1,750 bags of charcoal produced from matur



During establishment



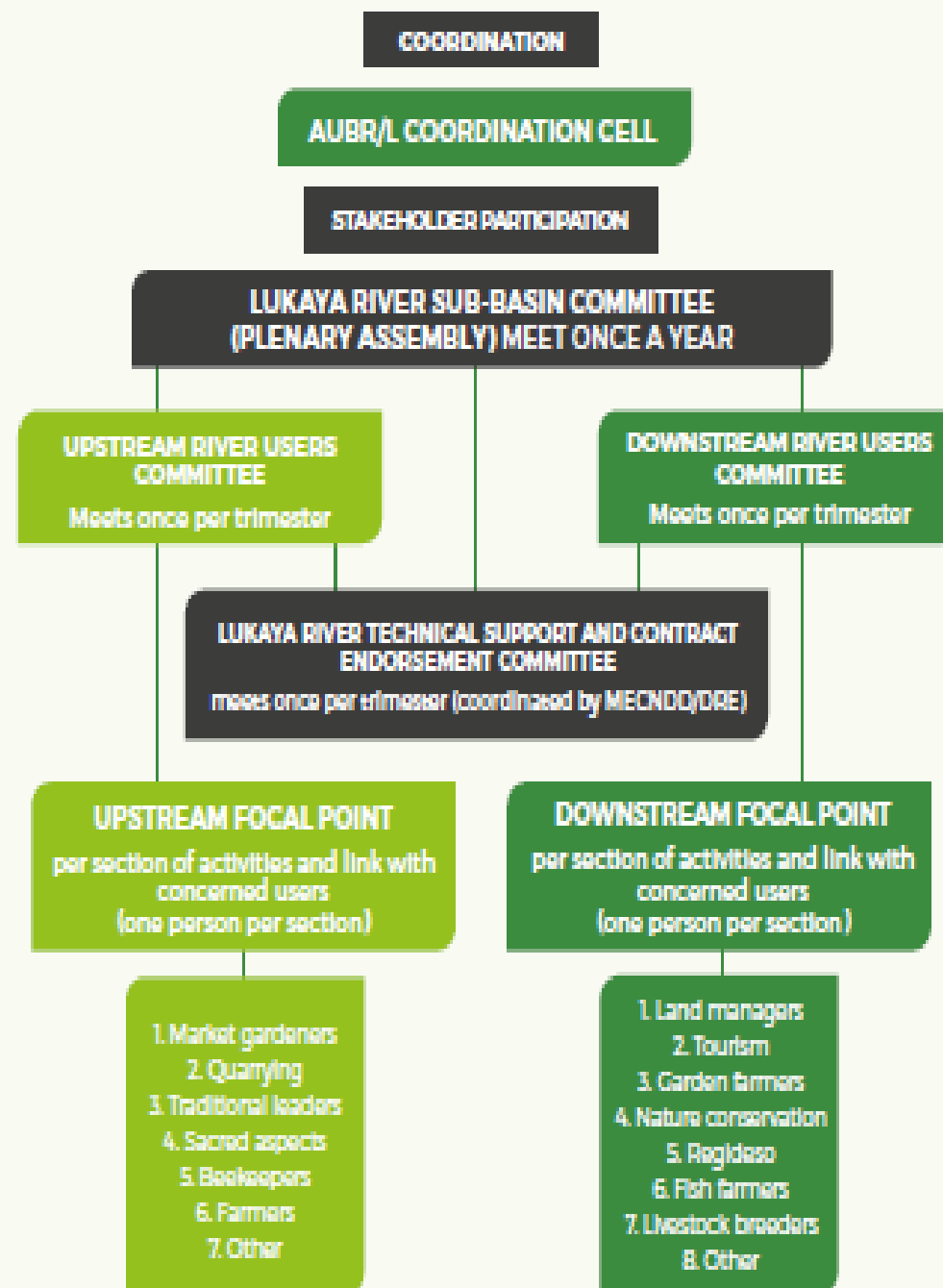
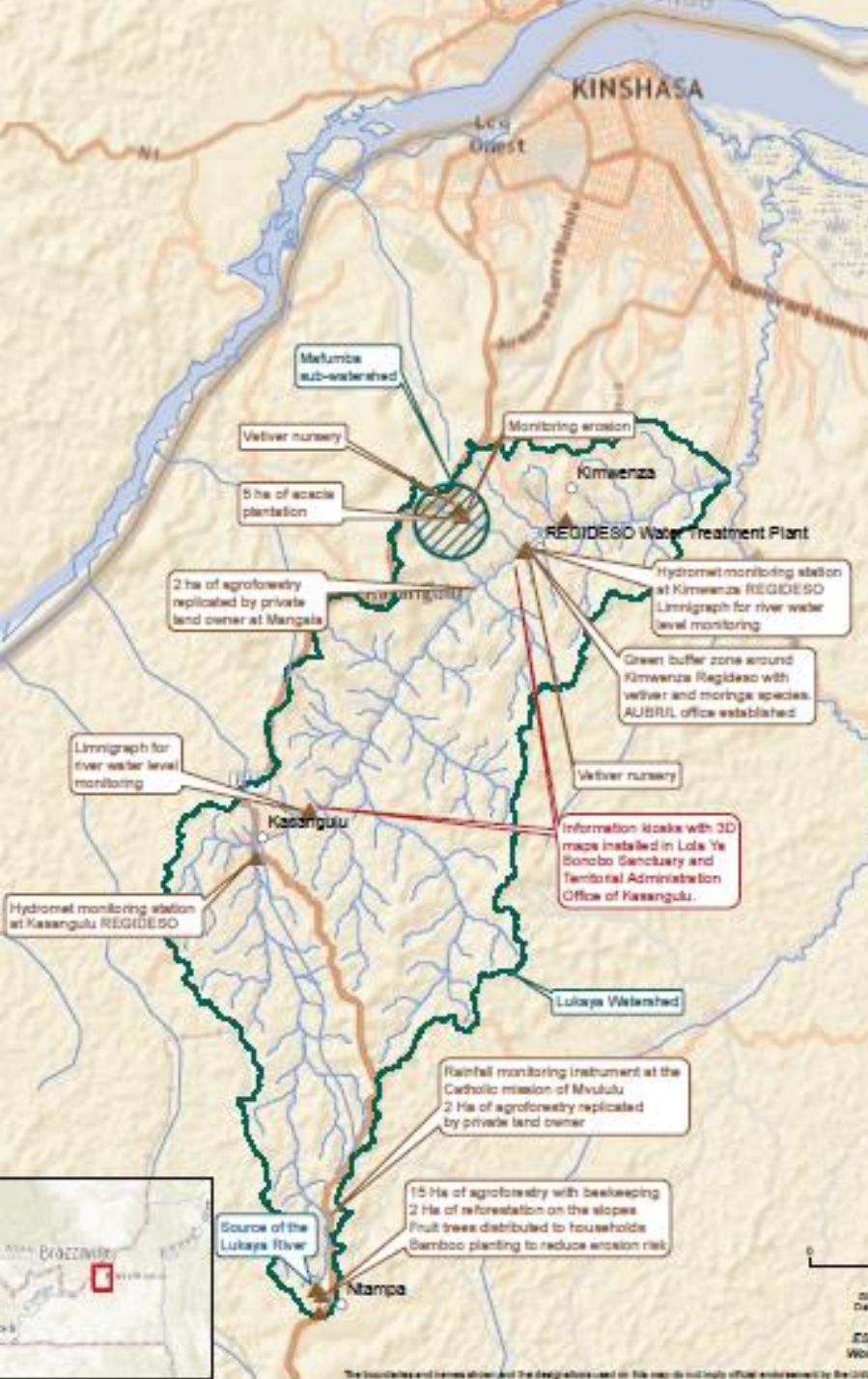
Gerkens M. adapted by C. Jacmain



1 year after



3 years after



Participatory 3D Modelling of the Lukaya River Basin



IWRM Action Plan for Lukaya with Eco-DRR components



Plan d'actions pour la gestion intégrée des ressources en eau du bassin versant de la rivière Lukaya (PAGIREL) 2016-2018

Establishing a National Platform on Disaster Risk Reduction

- National Workshop on Eco-DRR with a focus on Integrated Watershed Management
- National Eco-DRR Working Group convened comprised of Ministry of Environment, Ministry of Interior and Ministry of Social Affairs and Humanitarian Action
- Draft legislation to set up a National Platform on DRR prepared, supported by UNDP

Integrated water resource management for drought and flood risk reduction in Wadi El Ku, Sudan



Ecosystem in focus: drylands and wadi

Target: 5 communities with 30,000 inhabitants

Location: Kilimondo locality, North Darfur

Main hazards targeted: Drought and floods

Approach: Strengthening community-based water resource management to provide water for food security and restore natural vegetation cover



Community nurseries and forests help restore natural vegetation cover

Highlights of interventions:

Improving access to irrigation water

- Rehabilitation of an existing water retention structure in Eware
- 6,300 ha of otherwise dry wadi land was flooded resulting in more land available for cultivation and benefiting 4,500 farmers
- 315 ha of newly irrigated land was allocated to 150 landless households
- Establishment of a water resource management committee



Before



After

LAND UNDER CULTIVATION BEFORE AND AFTER
REHABILITATION OF THE EWARE WATER RETENTION STRUCTURE

Lessons from the field and our practice

1. Technically, it is possible to achieve disaster and climate risk reduction by investing in sustainable ecosystem management solutions.
2. Slow uptake, especially in developing countries, is generally a result of limited or lack of technical expertise and field experience, rather than due to a lack of buy-in or interest.
3. Many projects are implemented at pilot scale, having limited geographic coverage and limited impact on risk reduction. There are few models on how to up-scale Eco-DRR field interventions.

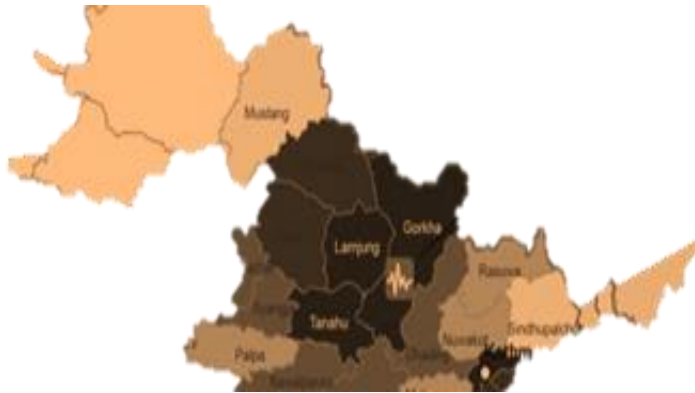
Lessons from the field

4. The reality is Eco-DRR approaches are not yet mainstreamed in development sectors, disaster risk management or climate change adaptation strategies in most countries
5. Although technical guidelines for Eco-DRR implementation are more available, many of these guidelines have not yet been subject to standardisation, thus discouraging greater up-take especially among engineers
6. No one partner can achieve scale and impact. We need to work through partnerships to consolidate expertise, financial resources and our comparative advantages

Lessons from the field

7. There is opportunity to integrate Eco-DRR in post-disaster reconstruction (SF Priority 4)

e.g. Nepal – Post-2015 Earthquake



Screening of the Post-Disaster Recovery Framework and Proposed Plans/Programmes/Projects with environmental sustainability and risk reduction lens



Where we want to go Eco-DRR: Going to Scale

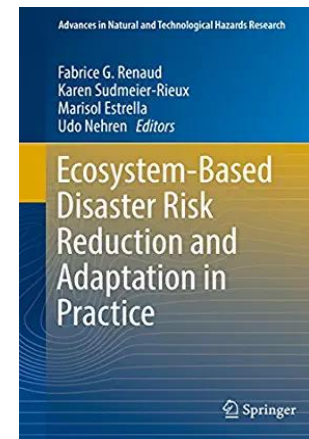
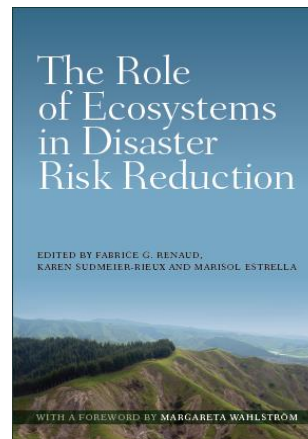
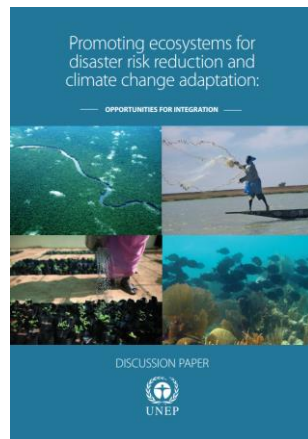
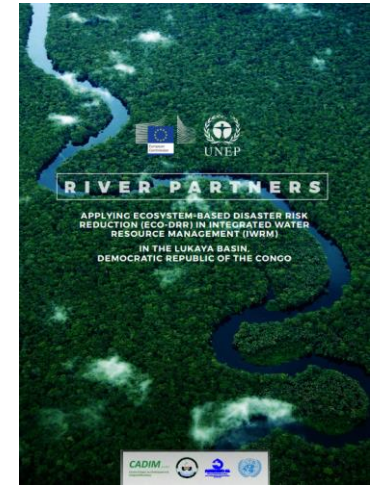
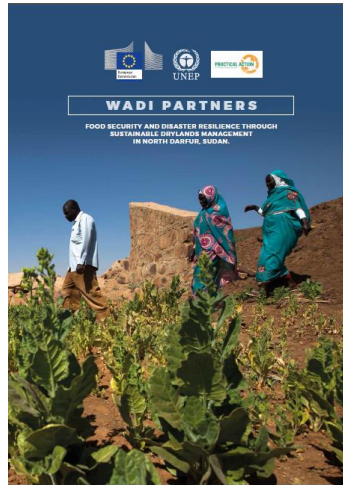
- **Scale up efforts**

- Opportunity Mapping for Eco-DRR
- Technical guidelines for implementation
- Technical assistance provided to existing ‘mega’ projects (USD 10- 100 million) for Eco-DRR mainstreaming
- Capacity building – 500 universities in 4 years + MOOC-2 in 4 languages + Certificate on Ecological Engineering

- **Leverage partnerships**

- PEDRR, Partners for Resilience
 - Business sectors – World Business Council for Sustainable Development, insurance, tourism
 - Conservation community: Convention on Biological Diversity, Ramsar Convention, World Heritage Convention
-

UN Environment publications



UN Environment Eco-DRR Videos

- UNEP and Eco-DRR (Global)

https://www.youtube.com/watch?v=Pf_t2h_9Z98

- Afghanistan:

<https://www.youtube.com/watch?v=nLzDdoS0fmQ>

- Sudan:

https://www.youtube.com/watch?v=ZsX_Nv6LZzY

- Haiti:

<https://www.youtube.com/watch?v=eThpDsywyzc>

- DR Congo:

<https://www.youtube.com/watch?v=IXjPEsu6jPM>



Thank you



Marisol Estrella
Programme Coordinator
Disaster Risk Reduction
marisol.estrella@unep.org

www.unep.org