Ecosystems, Livelihoods and Disaster Risk Reduction Workshop

- Summary of workshop notes -

Bonn, Germany, 21-23 September 2010

United Nations University
Institute for Environment and Human Security (UNU-EHS)

Executive Summary

About PEDRR

Formally established in 2008, the Partnership for Environment and Disaster Risk Reduction (PEDRR) is a global alliance of UN agencies, NGOs and specialist institutes. PEDRR seeks to promote and scale-up implementation of ecosystem-based disaster risk reduction (DRR) and ensure it is mainstreamed in development planning at global, national and local levels, in line with the Hyogo Framework for Action. It provides technical and science-based expertise and applies best practices in ecosystems-based DRR approaches. PEDRR is guided by its vision of: "Resilient communities as a result of improved ecosystem management for disaster risk reduction (DRR) and climate change adaptation (CCA)". Its objective is to pool expertise and advocate for policy change and best practice in ecosystem management for disaster risk reduction and climate change adaptation, based on science, practitioners' experience and indigenous knowledge.

Rationale

Ecosystem management is an integral part of disaster risk reduction. Disasters triggered by natural hazards, such as tropical cyclones, avalanches and wildfires, can have adverse environmental consequences. On the other hand, degraded environments can cause or exacerbate the negative impacts of disasters. Healthy and well-managed ecosystems- such as coral reefs, mangroves, forests and wetlands- reduce disaster risk by acting as natural buffers or protective barriers, for instance through flood and landslide mitigation and water filtration and absorption. At the same time, fully-functioning ecosystems build local resilience against disasters by sustaining livelihoods and providing important products to local populations.

The expert workshop on "Ecosystems, Livelihoods and Disaster Risk Reduction" aimed at bringing together both the scientific and the practitioner communities involved in DRR to foster dialogue in order to (i) highlight good practices that facilitate the adoption of ecosystem approaches in DRR when this is appropriate and (ii) identify knowledge gaps and needs of both communities in maximizing ecosystem services for livelihoods and DRR.

Objectives

- To take stock of the latest scientific developments on the linkages between ecosystems and their role in DRR, with a focus on reducing risks and vulnerabilities and increasing resilience of social-ecological systems;
- To understand how good practices on ecosystem-based approaches for DRR can provide a basis for innovative practices and institutional arrangements for the implementation of effective policies;

- To enhance the dialogue between the scientific and practitioner communities in order to improve knowledge and practice of ecosystem-based approaches for DRR.

Format

The workshop comprised oral presentations, a poster display, as well as working groups organized around pre-identified themes. The types of hazards considered were the following: (i) coastal hazards including (but not limited to) storm surges, hurricanes, tsunamis, flooding, coastal erosion, salinisation; and (ii) hazards related to hinterlands such as fires and landslides.

Key questions

I. *Introduction of concepts: Focus on storm surges, floods, landslides and wildfires*

- What are the relationships among ecosystems, livelihoods and disaster risk?
- What is our understanding of an ecosystems-based approach to disaster risk reduction?
- With respect to the specific hazard, how do environmental factors or environmental changes exacerbate hazard impacts and contribute to disaster risk?
- How are ecosystems and livelihoods adversely impacted by the hazard? Are there distinguishable thresholds or limits of ecosystem resilience?
- To what extent, and under which conditions, can ecosystems provide effective mitigation/ protection against the specific hazard and reduce vulnerabilities?

II. *Scientific knowledge, tools and methods*

- Based on the latest scientific knowledge and research, what is the contribution of ecosystem services and their management towards vulnerability and disaster risk reduction and livelihood resilience enhancement? What research gaps remain to be addressed?
- How could these services be measured (development of tools and methods) and how could this be translated for practitioners (or in user-friendly applications)?

III. *Practitioners' based knowledge, tools and methods*

- What were the practices, tools, methods and frameworks applied for integrating DRR and ecosystem management?
- Which were the successes and obstacles, factors that drove the process, actors involved and not involved?
- Which were the main processes and outcomes, and which were the expected long-term impacts or outcomes?

IV. *Integration of concepts: Implications for implementation*

- In reviewing the gaps and needs in terms of knowledge and practice, are there other potential gaps and needs that have not been covered in the discussions?

- Based on these identified and prioritized needs, what are possible solutions or recommendations to overcome these constraints and challenges? What are regarded as priorities?
- Based on experiences, what are (if any) existing mechanisms that facilitate science-practice dialogue? How can the science-practice interface be improved to enhance implementation of the proposed solutions or recommendations?

V. *Outcomes*

- One of the main outcome of the workshop was a priority list of actions to close some of the most pressing gaps identified on the thematic of ecosystems, livelihoods and disaster risk reduction. The first five identified priorities are:
- (1) More research on ecosystem thresholds to different hazards is needed.
- (2) Institutional capacity development on ecosystem-based disaster risk reduction approaches at country level is necessary.
- (3) Mainstreaming of ecosystem-based approaches and tools into disaster risk reduction and development planning is needed.
- (4) Valuing ecosystem functions and services (economic and non-economic) for disaster risk reduction needs to be identified/ clarified.
- (5) Initiating and strengthening the collaboration between scientists & practitioners for ecosystem-based disaster risk reduction is crucial.
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- The participants present at the workshop have indicated a keen interested in starting addressing these priority action points and follow-up activities are now planned within the partnership and beyond to work on them.

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Summary of Introductory Session:

Introductory remarks and Moderator: Fabrice Renaud (UNU-EHS), chair of the event.

Welcome address: Reza Ardakanian (UNU Vice-Rector a.i.)

- Participants were welcomed and encouraged to contribute with their knowledge and experience in finding opportunities to link ecosystems and disaster risk reduction.
- The relevance of the workshop and key issues to be addressed were highlighted, particularly in view of recent disasters, such as the 2010 floods in Pakistan.
- Participants are urged to communicate clear messages to policy makers for efficient implementation of ecosystem considerations in DRR.

Introduction to the Partnership for Environment and Disaster Risk Reduction, PEDRR: Radhika Murti (IUCN)

- Formally established in 2008, PEDRR is a global alliance of international organizations, NGOs and specialist institutes. Members include: UNU-EHS, IUCN, UNEP, UNDP-BCPR, ProAct Network, ADPC, GFMC, WWF, SEI and UN ISDR. The Council of Europe is a recent member.
- PEDRR's vision is to build resilient communities through improved ecosystem management for disaster risk reduction and climate change adaptation. PEDRR advocates policy change and best ecosystem management practices based on science, practitioners' experience and indigenous knowledge.
- Healthy, well managed ecosystems provide multiple services, help prevent disasters and build local resilience to the impact of natural hazards and climate change. This is a message that needs to be understood and disseminated.
- The Partnership promotes the implementation of ecosystem-based DRR and climate change adaptation and ensures it is mainstreamed in development planning at global, national and local levels, in line with the Hyogo Framework for Action.
- PEDRR partners share expertise, knowledge, networks and field experience. Through PEDRR, collective efforts have a higher advocacy impact.
- PEDRR gives its members the opportunity to form partnerships with each other and allows external organizations to connect with a whole network working on the topic instead of individual organizations.
- The Partnership is currently increasing its collaboration at the regional level, working with regional organizations and networks that share similar principles and approaches (e.g. the Disaster and Environment Working Group for Asia, DEWGA).
- PEDRR has participated in key international DRR events; for example, it led a side event at the IDRC 2010 in Davos and has started organizing its own events, such as this workshop in Bonn. Furthermore, PEDRR is preparing a background document for the ecosystems and disasters section of the 2011 UN ISDR Global Assessment Report.

Keynote: environment, disasters, and risk reduction, do we have a solid case?: Muralee Thummarukudy (UNEP)

- High levels of uncertainty in the occurrence of disasters constrain understanding the returns of investing in disaster risk reduction. This was graphically highlighted with photos of Haiti's Presidential Palace before and after the 2010 earthquake.
- Disaster risk reduction has gained increasing attention after the 2004 Tsunami. The protective role of mangroves was then used as an example of how ecosystems can buffer the effects of natural hazards. However, scientific evidence on the links between ecosystems and DRR is still missing.
- The importance of ecosystems for DRR and climate change adaptation should be emphasized based on scientific facts, and not just highlighted when an emergency occurs, like the 2010 floods in Pakistan or the forest fires in Russia. Only solid/proven scientific facts can ensure the credibility and policy application of the 'healthy ecosystems for DRR' message.
- In order to increase the effectiveness of DRR strategies, indigenous and scientific knowledge should be integrated and local traditions considered. Rigorous verification processes used in science should also be applied to indigenous knowledge for ecosystem management.

Introduction to the workshop: Fabrice Renaud (UNU-EHS)

- The focus of the workshop on livelihoods, ecosystems and DRR created a large interest for attendance.
- A general overview of links between ecosystems and DRR was presented. It included the role of ecosystems in providing livelihoods, increasing resilience and reducing exposure and vulnerability of communities and their assets to the impact of natural hazards. Conceptual frameworks and methodologies that link ecosystems and DRR were also briefly presented.
- The workshop intends to achieve the following objectives: 1) To take stock of the latest scientific developments on the linkages between ecosystems and their role in DRR; 2) To take stock of good practices on ecosystem-based approaches for DRR. 3) To enhance the dialogue between the scientific and practitioner communities in order to improve knowledge and practice of ecosystem-based approaches for DRR.
- While the workshop involves oral and poster presentations, it is focused on group and plenary discussions. Four main and interlinked sessions were planned, with key questions provided to

guide the work of the participants. Additionally, the workshop will benefit from an innovative graphic facilitation approach, led by UNU staff.

- Due to time constraints only floods, landslides, wildfires and coastal hazards (e.g storm surges) would be discussed in detail during the workshop.
- Among expected outputs are: a) a roster of scientists, experts and practitioners working on ecosystems and DRR. This will permit strengthening contacts and networking opportunities after the workshop and will be a "living" document to be updated regularly; b) a roadmap for the future, i.e. research agenda and identified capacity building activities; c) a two-page policy statement and d) a final book/publication of the workshop to be ready in one to one and a half years time. Participants have been invited to submit contributions to this publication.

Introduction to the graphic facilitation methodology: Graphic facilitation team (UNU-ViE).

- The graphic facilitation team presented the methodology that would be used during the course of the workshop. During an ice breaking activity, they asked all participants to introduce themselves and speak about their vision for the future with regards to linking ecosystems and DRR. All comments were recorded and used as guidance in the following discussion sessions. At the end of the workshop the initial comments would be revisited, revised and used as the base for the future work road map.

  Proposed inputs towards creating a common vision include the following:
- Need to define economic values/figures for the role of ecosystems in DRR.
- Practical difficulties faced due to time investment needed for ecosystem management to achieve desired results.
- Need to act with a long term vision without forgetting the need for specific short term targets.
- Impacts at the policy level are key challenges.
- Need for clear scientific evidence linking ecosystems and DRR.

Summary of Session 1:
Introduction of concepts: Focus on storm surges, floods, landslides and wildfires

Objectives

- To level-off conceptual understanding amongst participants on ecosystems, livelihood and DRR linkages;
- To review our understanding of specific hazards (storm surges, floods, landslides and wildfires) and the role of ecosystems in reducing vulnerabilities to hazard impacts.

Key questions

Plenary

- What are the relationships or linkages between ecosystems, livelihoods and disaster risk?
- What is our understanding of an ecosystems-based approach to disaster risk reduction?

Break-out group sessions

- With respect to the specific hazard, how do environmental factors or environmental changes exacerbate hazard impacts and contribute to disaster risk?
- How are ecosystems and livelihoods adversely impacted by the hazard? Are there distinguishable thresholds or limits of ecosystem resilience?
- To what extent, and under which conditions, can ecosystems provide effective mitigation/ protection against the specific hazard and reduce vulnerabilities?

Key points from the discussions

Introductory remarks and moderator: Prof. Sam Hettiarachchi (University of Moratuwa)

Overview presentation on ecosystems, livelihoods and DRR (based on Background / GAR draft report): Marisol Estrella (UNEP) and Nina Saalismaa (Consultant, ProAct Network)

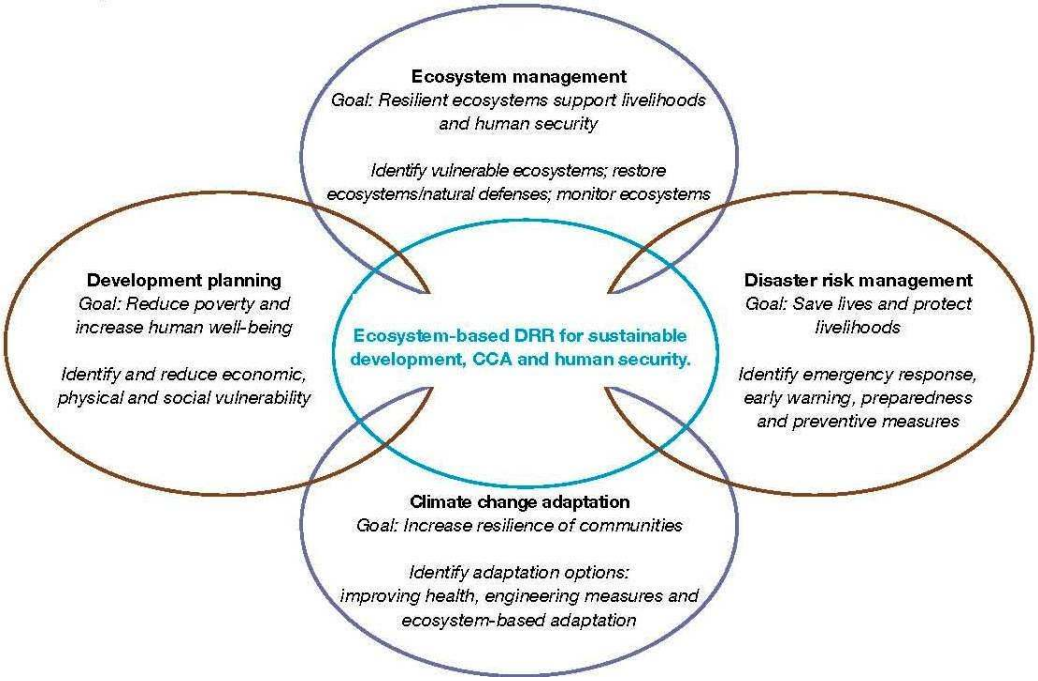
Understanding the linkages between ecosystems, livelihoods and disaster risk

- General agreement amongst participants that ecosystems play an important role in disaster risk reduction and in supporting local livelihoods.
- However, known examples of effective linkages between ecosystems, DRR and livelihoods are location specific, and should always be analyzed in the context in which it is applied, taking into consideration, for example the scale of the catchment area, species composition of the forest, topography, etc. The extent to which these experiences can be scaled up and replicated is yet to be tested.
- Also, while scientific knowledge/information on this topic is increasing, it is still very much nascent. In some cases, scientific results contradict each other, for instance in the case of mangroves and their protection values with respect to tsunamis.

- Significant knowledge gaps still remain, especially with respect to limits and thresholds of ecosystems services for DRR. More research is needed to fully understand ecosystem thresholds of resilience with respect to specific hazards.
- Addressing knowledge gaps through research requires multi-, inter-disciplinary teams, including ecologists, engineers, geologist, hydrologist, etc. working together.
- It is important to distinguish between the performance, function and services provided by specific ecosystems.
- Advocating for ecosystem-based DRR approaches should be in the context of pursuing social justice / poverty reduction and economics / economic development. Economics, in this case, would go beyond simply evaluating or monetizing ecosystem services but also involve discussions with economic actors and land use planners.
- There are major challenges in attempting to put economic values to ecosystem services. Difficulty in costing ecosystem services, for instance, in real estate economics. With respect to the question "How many lives did you save?", the same ecosystem services across different contexts would have different costs based on the different measures of human life. It is important to look at economic valuation methodologies as only one tool in the toolbox and recognize its limitations.
- There is need to develop an effective communication strategy/approach for advocating ecosystems-based DRR to the "non-converted" – e.g. non-ecologists, policymakers, planning engineers, etc. Terminology and language used by ecologists may not be readily understood and thus accepted by policymakers and development decision makers. The target audience must be specified and language for communicating key messages modified accordingly.
- It is important to draw lessons from history and understand both positive and negative effects of natural hazards, such as floods and fires. Analyzing past and current experiences of "living with floods" and "living with fires" may provide important lessons to policymakers and governments and establish an appropriate hazard management option.
- A multi-hazard approach to DRR must also be adopted, as evidenced by examples from the Sichuan earthquake (China) where decisions to rebuild settlements, while minimizing risk of earthquakes, exposed people to floods as they were relocated on the floodplain close to the river.
- Environmental changes – e.g. land use, deforestation, climate change/variability, etc. – were considered as important factors in increasing vulnerability and decreasing the effectiveness of the hazard regulatory functions of ecosystems.

What is our understanding of an ecosystems-based approach to disaster risk reduction?

- Levelling-off on common understanding of an ecosystems-based approach to DRR was not discussed at length during this session. A conceptual framework was provided in the overview presentation based on the background paper (also input to the GAR 2011) that was circulated to participants. Emphasis was made on the importance of drawing from the knowledge, practice and experience from four areas of work: (i) development planning, (ii) ecosystem management, (iii) disaster management, (iv) climate change adaptation. See figure below (Sudmeier-Rieux and Ash 2009). Ecosystems-based approaches / current practices were also discussed in greater detail in Session 3.



Other key issues raised

- While the aim of the session was to engage in technical discussions on the linkages between ecosystems, livelihoods and DRR and ecosystems-based approaches, participants raised the importance of also addressing policy considerations, including governance issues and the need for collaboration among different disciplines / sectors / agencies.
- Platforms, networks and partnerships were considered to be critical for effective implementation of ecosystem-based DRR. It was agreed that there would be no need for generating new platforms or networks but rather to build on existing platforms / networks / partnerships and improving / enlarging the stakeholders already included. There should be opportunities to bring together scientists (from different disciplines such as engineers and ecologists), academia, policymakers, practitioners, international organizations, donors, etc. Platforms should aim to influence national budgeting processes, governance mechanisms at the country level – going beyond knowledge exchange. Examples from Asia, such as the Adaptation Knowledge Platform and the Mangroves for the Future initiative, are good starting points for knowledge exchange and undertaking implementation on the ground.
- Promoting the protection of ecosystems, in some cases could generate or create conflict with local communities who want to access ecosystem services. However, it was also pointed out that there is danger in presenting an either-or scenario with respect to ecosystems protection and local livelihoods. Rather, both should be viewed in an integrated manner.

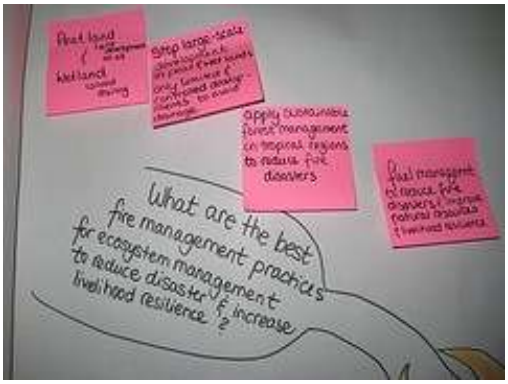
Summary of identified gaps and needs

- Maximize collaborative partnerships / networks in delivering common messages / advocacies.
- Further research on ecosystem and DRR linkages, ecosystem thresholds, functions, performance, etc. Limits and thresholds of ecosystems' DRR services are still to be fully understood (how much an ecosystem could absorb specific types of hazards).
- Need for inter-disciplinary teams with engineers, ecologists, geologists, hydrologists, etc. working together to become the norm.
- Inclusion of "economics" in the discussion – not just with respect to economic valuation of ecosystem services but also furthering discussions with economic planners and actors (i.e. Budgets).
- Need for improved communication approaches, tailoring messages to specific audiences.
- Promote integrated approach between livelihoods development and ecosystems management.
- Adopt a multi-hazard approach in DRR strategies.
- Need to focus on other hazards such as drought.
- Greater appreciation of local governance, policy processes in the mainstreaming of environment-DRR approaches.

Break-out groups: summary

Wildfire

- Fires are not necessarily a disaster, but weather extremes can translate fires into disasters. Need to distinguish between types of fire hazards (e.g. in fire-adapted vs. non-fire adapted ecosystems).
- Land-use changes and practices influence fire impacts.
- Negative effects include: loss of vegetation, loss of biodiversity and soil degradation, changes in ecosystems, which may make them more vulnerable to future fires, property damage, health risks, and reduced water availability.
- In some cases, the ecosystem is the hazard, not the fire. To reduce risks: reduce fuel for fire, manage species composition, land management and tenure, "living with fire" approach.
- Three major parameters in determining ecosystem services for fire risk reduction: (i) types of fire (early burning/low intensity vs. high intensity), (ii) ecosystem type (tropical forests vs. savannah vs. coniferous forests), (iii) timing.



Landslides

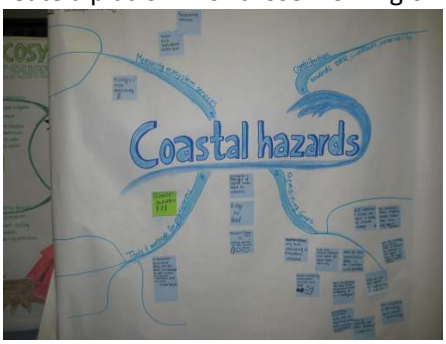
- Environmental drivers include social and economic factors increase vulnerability to landslides. People's assets are exposed to landslides.
- Environmental management practices by local communities are short-term. People's land management practices do not take into account landslides. For example, in Mexico, the government built roads to improve access to certain landslide-prone communities. However road construction increased the prevalence of landslides in the area.
- Knowledge transfer between communities of scientists and practitioners is necessary.

Floods

- Environmental changes exacerbate hazard impacts. For example: Kenya, deforestation caused flooding. Mozambique: resettlement of people resulted in increased deforestation. Eastern Europe: settlements in the Danube River floodplain have necessitated major responses. Santa Fe: Parana River tributary flooding Santa Fe due to wetland reduction upstream. Pakistan: extensive canals built to facilitate irrigation became main channel for flood waters flowing down mountains; improper development encouraged the disaster.
- Climate change exacerbates risk and impacts, as disasters become more frequent.
- Departments that deal with disasters are humanitarian and can therefore only provide a "band-aid" solution.
- Important to take into account ecosystem services in post-disaster recovery. Can be a good opportunity to focus on better ecosystem management.
- Also important to recognize that floods have beneficial effects, part of natural systems. The EIEA of floods can be a tool to determine what level of flooding is positive or negative.

Coastal hazards

- Coastal ecosystems include dunes, coastal lakes, beaches, coral reefs, among others.
- Some episodic events are becoming chronic events. Combined with soil erosion, sea level rise can claim 3 times the amount of land.
- Ecosystem management is a tool that needs to be combined with other elements.
- Emphasize the importance of community empowerment.
- Important to create a platform for those working on DRR and on ecosystems.



Summary of Session 2:
Scientific knowledge, tools and methods

Objectives

- To review the latest scientific developments and working hypothesis with respect to ecosystems, ecosystem services and DRR;
- To review the latest tools and methods used for linking ecosystem management and DRR;
- To identify key research gaps that remain to be touched upon when addressing the role of ecosystem, ecosystem services and DRR.

Key questions

- Based on the latest scientific knowledge and research, what is the contribution of ecosystem services and their management towards vulnerability and disaster risk reduction and livelihood resilience enhancement? What research gaps remain to be addressed?
- How could these services be measured (development of tools and methods) and how could this be translated for practitioners (or in user-friendly applications)?

Key points from the discussions

Introductory remarks and moderator: Torsten Welle (UNU-EHS)

On landslides, ecosystems and livelihoods: Karen Sudmeir-Rieux (IUCN)

Vegetation and landslide mechanisms: Heru Santoso (Indonesian Institute of Science)

Wildland fires and ecosystem services: the role of fire management in stabilizing ecosystems and reducing wildfire and secondary disasters: Anja Hoffmann, Alex C. Held, Nikola Nikolov, Sundar P. Sharma (Global Fire Monitoring Center (GFMC) / United Nations University UNISDR, Global Wildland Fire Network and Wildland Fire Advisory Group, GOFC-GOLD Fire Implementation Team)

What do ecosystems have to do with cyclones, earthquakes and tsunami?: Brian McAdoo (Vassar College)

The role of coastal ecosystems and natural disturbances: Carmen Lacambra Segura (University of Cambridge)

Issues options and strategies for flood management: shifts in approaches for flood management in Bangladesh: Raquibul Amin (IUCN Asia)

Key issues raised

- Many hydrological models that include water flow within mangrove systems have not been validated on the ground. In contrast, hydro-dynamic models have been calibrated in relation to climate change and tsunamis.
- It is accepted that relying only on peer-reviewed articles is not sufficient as countries have research in their own language which should be taken into account. In this respect, it is important to take into consideration local information but it is also important to encourage international publications of such work.
- Partnerships with local universities, NGOs, research institutes are crucial; however, if the message is too negative or drastic, it will be disregarded by policy makers. What types of information then should be communicated to policy makers? A possible answer is to sell the idea of ecosystem services as it has been done so far (e.g. livelihoods, biodiversity etc) but now highlighting their DRR potential, while acknowledging that investing in ecosystems is not a single solution to disasters but it can be used in combination with other measures such as early warning.
- A challenge to communicate ecosystem-based DRR messages to policy makers is that uncertainty is not quantifiable or well understood. Some participants suggested that uncertainty should be managed within the scientific community but the message to engineers and non-scientific stakeholders should be clear. For instance, mangroves may not be a measure to fully prevent disasters, but they are very important in terms of biodiversity and livelihood support (e.g. fishing). When scientists talk to policy makers they should communicate a clear and straightforward message. However, scientists may not be able to deliver these messages as data is still not fully clear given that ecosystems are complex systems.
- A big challenge for scientists is that they need to publish two reports, one for 'scientific' journals and another for the public, media and policy makers. Science needs to communicate messages clearly. However, this can be sometimes problematic due to uncertainties reflected in the scientific results.
- Science should communicate with, and not just report to policy makers with respect to determining information and research needs (i.e. applied scientific research, demand-driven research).
- It is important to obtain information/knowledge from science but also from local communities. Local communities already know how to deal with some types of impacts and failing to take this into account would lead to the loss of valuable knowledge. Combining scientific and local knowledge and experience is ideal.
- When we need to cooperate with policy makers/ stakeholders from the beginning, considering a combination of applied research and participatory approaches is fundamental. It may represent additional work but it fosters greater buy-in and support. INGOs and UN agencies are important for creating links between the scientific community and local politicians when scientists don't have direct access to local decision-makers.
- Donors present at country level can also play an influential policy role and can facilitate collaboration between government agencies and sectors.

Concluding discussion and session synthesis: Graphic facilitation team (UNU-ViE) and Torsten Welle (UNU-EHS)

- Scale and definition of ecosystems for DRR work were discussed, with the group adopting the definition of ecosystems provided in the Millennium Ecosystems Assessment.
- Measurements discussed included remote sensing, smart indicators, participatory analysis of ecosystem and livelihood trends and methods of ecosystem monitoring.
- Research gaps: frequency and magnitude of events – we know more about frequent, low intensity events than about rare, high intensity ones; scale; uncertainty analyses; hazard independent vulnerability assessment for DRR.

Q&A and discussion

- There was a discussion on how to measure ecosystem services. Based on practical experience, one participant pointed out the problem of reliability in assessment approaches.
- Though scientists have developed frameworks to assess vulnerability (ref. to Fabrice Renaud's presentation), it is necessary to make these frameworks more operational for practitioners. Currently, they are complicated and difficult to implement.
- It is important to define multi-level vulnerability and risk assessment frameworks, which use models that can be fed with different levels of data.
- Despite a wide array of frameworks there are no comprehensive vulnerability assessment methodologies.
- Local capacity is lacking to undertake major forms of vulnerability assessments and monitoring.
- From a practitioners' point of view, vulnerability is constantly changing due to hazard impacts.
- Assessment of institutional changes such as rules, behaviour, self-organizing organization is needed.
- There is no accurate government-data collection at local levels; governments tend to only run post disaster needs assessment.
- Two possible approaches for practitioners were suggested: generic examples (with consequences) and use of simple methodologies which provide general, more qualitative overviews. e.g., Provention Consortium has developed Community Risk Assessment (CRA) Toolkit with 26 methods.
- Another example is "Climate Risk Screening Tool – Adaptation & Livelihoods", which is currently reviewed by IUCN because certain issues are not addressed.

Break-out groups: summary

Coastal hazards

- Reporting for group: Fabrice Renaud (UNU-EHS)
- Six ecosystem that support DRR were flagged up as important:
    - Upland vegetation and woodland
    - Coastal vegetation and mangroves
    - Salt marsh and wetlands
    - Beaches and Dunes
    - Seagrass beds
    - Coral reefs
- Research gaps
    - Increase in uncertainty of the role of ecosystem services for coastal hazard events (intensity and frequency dichotomy) makes only partial conclusions possible. Need for more scientific research.
    - More or additional knowledge about the individual components of an ecosystem is essential to understand the complex interaction between all ecosystem components. A Possible approach is to look at ecosystems in a more holistic manner such as from 'Ridge to Reef'.
    - Interdisciplinary research between engineers who work on scenario based models and ecologists who work on ecosystem services could improve the understanding of disaster impacts.
    - Information generation and transfer to various stakeholders is still a challenge that could be improved if different types of communication platforms are in place and used.
    - Ecosystems are affected by events that may naturally-ocurr and that do not affect their regeneration capacity, but they may be affected by over-extraction of resources to meet human demands. Therefore, research on the interaction between the natural and social components of ecosystems is needed in the context of DRR.
    - Interdisciplinary research and practical projects are needed to ensure interaction between various disciplines.
    - Funding for long-term monitoring before and after hazardous events would be essential to ensure information on the dynamics of all ecosystems' elements.
    - It is necessary to value ecosystem services more efficiently. For example, at this point provisioning services are better understood than regulating services. Adequate methods or best practice approaches for measurement of ecosystem services as well as the development and identification of relevant indicators of social impacts are key.
    - There is a need to mainstream ecosystem services in DRR planning.

Floods

- Reporting for group: Michael Thurmann (UNDP Regional Centre for Europe and GIS)
- Measuring ecosystem services
    - Measures conducted are context-specific
    - Physical exposure and hazards are well modelled but vulnerability measurements are lacking, especially for minor events (measuring scale).

    - Baseline evaluations are fundamental to measure impacts, but often not available.
    - Quantitative vs. qualitative analysis (national/scientific vs. local community level).
- Methods
    - Local level risk assessment.
    - Methods for participatory planning and multi-stakeholder risk analysis exist but documentation is often lacking.
    - Combination of GIS methods with participatory approaches are used but challenging.
- Gaps
    - Low availability of livelihoods data at local level.
    - Climate change information for local level use (downscaling global circulation models).
    - Scientific models not generally available to national government agencies.
    - Lack of scientific evidence for climate risk management to integrate ecosystem-based DRR.
    - Multi-hazard and interdisciplinary approaches missing.
    - Communication and information gaps.
    - Need to focus on chronic, slow-onset and recurrent hydro-meteorological disasters, such as drought over rapid-response one-time events such as flooding.
    - Water quality needs to be considered in the aftermath of floods.

Landslides

- Reporting for group: Ulan Kasymov (University of Berlin)
- Ecosystem services that support DRR
    - Direct services include vegetation cover and soil formation.
    - Indirect services include ecosystem based-traditional knowledge (i.e. warning systems).
- Scientific gaps
    - Determining the role of ecosystem regulating services linked to landslides.
    - Thresholds and tipping points for different types of landslides.
    - Role of agricultural/pasture management practices.
    - Communication problems between science, policy and society.
    - Development of communication tools.
    - Quantifying the role of vegetation in landslide prevention.
    - Interdisciplinary assessments.
- Methods
    - Remote sensing, GIS and mapping as top down approaches.
    - Participatory risk mapping as bottom up approach.
    - Stakeholder mapping.
    - Institutional analysis.
    - Multiple ecosystem value (intrinsic vs. economic values).
    - Ecosystem evaluation (need to communicate ecosystem values).

- Tools
    - Stakeholder platforms.

- Community-based DRR.
- Local monitoring.
- Local early warning systems.
- Natural resource management.
- Integrated watershed management (cross level and stakeholders).
- Land use planning (municipal level and legal framework).
- Soil and Water Conservation (terraces).
- Protected areas.
- Manuals on slope stabilization.
- Bioengineering.

Wildfires

- Reporting for group: Alex Held, Nikola Nikolov (Global Fire Monitoring Center (GFMC), Faculty of Forestry, Macedonia)
- Key messages
    - Fuel management reduces fire disasters and improves the availability of resources and local resilience.
    - Species composition – tree composition of the forest needs to be taken into account and managed, especially in areas being afforested.
    - Wetlands need to be protected, avoiding artificial drainage and development to prevent conditions for fire.
    - Tropical regions have a special need to reduce fire risks.
    - No methods to measure ecosystem services were mentioned, even if remote sensing technologies are available because they do not offer the information needed from a technical monitoring perspective.
    - Community based management evaluation approach in terms of livelihoods. Measuring value is challenging for non-timber products.
    - Most fires are mostly human-induced therefore social aspects are especially critical.

Summary of Session 3:
Practitioners' based knowledge, tools and methods

Objectives

- To facilitate information sharing amongst participants on examples of ecosystem management in the context of the DRR and "state of the art" approaches in practice;
- To document concrete examples of ecosystem management for DRR, which can be disseminated and promoted as good practices.

Key questions

Main tools and practices

- What were the practices, tools, activities methods, methodologies, frameworks applied for integrating DRR and ecosystem management?

Main successes, main obstacles

- What worked and what didn't work?

Driving forces, main actors

- Who and what factors drove the process?
- Who was involved in the process?
- Who was not involved in the process and why?

Main processes, main outcomes

- What was achieved (or not) in practical terms?
- What are the tangible results or outputs from the project or activity?
- What are the expected long-term impacts or outcomes?

Key points from the discussions

Overview presentations on documenting knowledge, tools and methods, including objectives of the session: Karen Sudmeier-Rieux (IUCN)

Ongoing projects and initiatives were discussed by participants to address the above questions. The marketplace format allowed participants to exchange experiences, facilitated dialogue for future collaboration, identified opportunities for incorporating scientific information into ongoing initiatives and contributed to overall awareness amongst participants on how ecosystem-based DRR could be applied in practice.

Integrated natural resource management for disaster risk reduction in southern Kyrgzstan: Aida Gareeva (Camp Alatoo)

This presentation illustrated an example of social participation in ecosystem management for DRR. It focused on practical ways the stakeholders have integrated ecosystem-based measures for maintaining the integrity of a watershed and reducing risks.

Key challenges highlighted in the presentation were:

- The need for methods to integrate diverse fields of data (such as hazard mapping and natural resources);
- Facilitating interdisciplinary knowledge sharing;
- Overcoming sectoral views amongst stakeholders.

Synthesis of market place discussions and presentation of selected projects: Radhika Murti (IUCN)

Tools

Some common tools used for ecosystem based DRR work are Geographical Information System (GIS) maps, statistical analysis and participatory methods. While there is a range of tools available, more guidance is required on which tools to use and when. Country assistance strategies, national plans, project term reviews, infrastructure development plans and tools such as the Post Disaster Needs Assessment (PDNA) can also be used as tools/entry points for promoting ecosystem based strategies. While a comprehensive list of specific tools were not identified in discussions, key elements of implementation strategies and methods that are critical for the success, failure, design and purpose of an ecosystem based DRR initiative were identified.

Successes

- Government buy-in and long term ownership through constructive negotiation and flexibility;
- Multi-sectoral government cooperation and participation;
- Community participation, leadership and ownership;
- Facilitation of dialogue between scientists and communities to identify common ground;
- Regular communication amongst all stakeholders involved;
- Strategic persistence and persuasion using evidence based advocacy;
- Building on existing work, where applicable;
- Awareness raising and facilitating the understanding of ecosystem, DRR and livelihood links;
- Local and national government bodies to collaborate
- Integrated land-use planning to be a key element in designing the projects;
- Practitioners should establish demonstrable outcomes from the project to provide incentives for proactive participation.

Obstacles

- Lack of hard evidence and information on critical linkages for the need to include ecosystem based strategies for DRR;
- Ecosystem management is not always part of immediate post-disaster concerns as this is considered more long-term;

- Shifting objectives that are no longer embedded in the project, due to lack of adaptive management measures in the initial design of the project;
- Lack of or no access to required data, lack of capacity to process information;
- Political and legal boundaries pose a challenge in cross boundary ecosystems such as watershed;
- The need for better understanding of vulnerability assessment and available tools;
- Challenges in identifying shorter term tangible outcomes and community benefits to maintain stakeholder engagement and interest;
- Terminology and information processing for communities to understand scientific developments;
- Changes in donor policies and timelines;
- There is a greater need to understand the functions and limits/thresholds of ecosystems in DRR;
- Lack of sound policies in prioritizing ecosystem based DRR;
- Ecosystem damage is not effectively reported after a disaster and therefore becomes a challenge in advocating for its potential to reduce hazards;
- Guidance on mitigation and prevention is not adequate, especially on specific and links with ecosystem based management and risk assessments.

Driving Forces

- Hazard affected communities, livelihood security and rehabilitation needs;
- Donor initiative through corporate change;
- Effective policies from international negotiations and forums;
- Government commitment and initiative;
- Liability and increased risk challenges;
- Establishing the cost effective case for ecosystem based solutions;
- Paradigm shift toward prevention and mitigation;
- Science influence on policies;
- Climate change and increased awareness are forcing more integration of DRR and ecosystem management;
- ISDR Hyogo framework for Action – Priority Action 4 – Addressing underlying risk factors

Examples of actors who were critical in the establishment and ongoing implementation of the projects

- Schools;
- Local communities;
- Non-profit local organisations;
- Pressure groups, Civil groups
- Regulatory bodies;
- Media
- Developers
- National and local DRR authorities
- Donors
- Private sector

Summary of Session 4:
Integration of concepts: Implications for implementation

Objectives

- To review and prioritize gaps and needs identified in Sessions 1 to 3 with respect to knowledge and practice of ecosystem-based disaster risk reduction approaches;
- To identify proposed solutions or recommendations and develop a clear and practicable agenda to better maximize ecosystem services for disaster risk reduction.

Key questions

- In reviewing the gaps and needs in terms of knowledge and practice discussed in Session 1 to 3, are there other potential gaps and needs that have not been covered in the discussions?
- Based on these identified and prioritized needs, what are possible solutions or recommendations to overcome these constraints and challenges? What are regarded as priorities?
- Based on experiences, what are (if any) existing mechanisms that facilitate science-practice dialogue? How can the science-practice interface be improved to enhance implementation of the proposed solutions or recommendations?

Key points from the discussions

Introductory remarks and moderator: Ioana Creitaru (UNDP)

An overview of the key linkages between ecosystems, livelihoods and DRR as discussed in Sessions 1 to 3 was presented. This was followed by an exercise where participants were presented with a list of knowledge and practice gaps identified in Sessions 1 to 3. Participants were then asked to validate the list and provide additional inputs as appropriate. Once the list of gaps had been reviewed, participants voted on which gaps should be prioritized. The top 5 prioritized gaps/needs receiving the most votes were then selected, and participants discussed in plenary their proposed recommendations to address the prioritized gaps/needs and needs.

List of gaps and needs with respect to knowledge and practice of ecosystem-based disaster risk reduction approaches (consolidated from Sessions 1 to 3):

1. More research on ecosystem thresholds to hazards of different types and characteristics (slow, chronic, episodic, rapid) is needed.
2. Institutional capacity building on ecosystem-based disaster risk reduction approaches at country level is necessary.
3. Mainstreaming of ecosystem-based approaches and tools into disaster risk reduction and development planning is needed.
4. Valuing ecosystem functions and services (economic and non-economic) for disaster risk reduction needs to be identified/ clarified.
5. Initiating and strengthening the collaboration between scientists and practitioners for ecosystem-based disaster risk reduction is crucial.

6. Lack of data on vulnerability and challenges in measuring it– specific practical methods needed.
7. Communication tools necessary for disseminating knowledge and feedback loops to policymakers, decision makers and communities.
8. Interdisciplinary and trans-disciplinary assessment tools and practices are increasingly necessary, e.g. quantitative scientific and participatory methods, scientific, use of traditional knowledge.
9. Bringing slow-onset disasters into the DRM and DRR agenda, e.g. drought and food security.
10. Long term monitoring and evaluation (before and after the disaster event) of ecosystem functions and components.
11. Clarifying and measuring ecosystem functions and services (regulatory, especially) – economic and non-economic valuations.
12. Understanding and anticipating local impacts of climate change.
13. Knowledge "bank" for ecosystem, DRR science and practices.
14. Platforms and partnerships that bring together different actors, e.g. ecologists, engineers and DRR managers needed.
15. More research on human vulnerability and risk to higher impacts of natural hazards, e.g. earthquakes, landslides.
16. Guidelines that help policymakers and decision-makers choose most appropriate methodologies and approaches.
17. Guidelines for undertaking (baseline) risk assessment (that include ecosystem services) and applying findings - integrate this into county development plan and country assistance frameworks.
18. Institutional capacity (at country level) building on ecosystem-DRR links and mainstreaming to development.
19. Integrating ecosystem-based DRR in university curricula/education/awareness raising.
20. Environmental Law (legal and policy frameworks) does not address disasters and vice versa.
21. Research on impacts of single and cumulative landscape level DRR approaches.
22. Opportunities in climate change and other global agendas.

List of Top 5 prioritized gaps/needs and proposed recommendations for action of selected identified gaps

(1) More research on ecosystem thresholds to hazards of different types and characteristics is needed.

- Conduct basic research: linking ecological systems with geo-morphological and hydro-meteorological approaches.
- Conduct literature (scientific studies) and project (case studies) review.
- Analyse existing case studies/ project examples through an interdisciplinary and transdisciplinary lens with respect to specific hazards.
- Collect information, establish database or link existing databases and reference sites on a common (global) platform, paying special attention to local studies and projects.
- Conduct both pre-disaster and post-disaster evaluations.
- Analyse and communicate which existing methods and tools have been used and can be applied on specific hazards and situations.

(2) Institutional capacity building on ecosystem-based disaster risk reduction approaches at country level is necessary.

- Build on the NAPA and UNDAF processes.
- Utilize existing ISDR National Platforms.
- Review and adapt existing training courses and existing institutionalised training systems.
- Examples: CADRI (Capacity for Disaster Reduction Initiative)[1], ADPC, IFRC trainings.
- Focus on (national and regional) institutional capacity assessments; entry point: National Capacities for Self-Assessment (NCSA).
- Enhance collaboration at country level among different sectors: environment, social sector, finance, etc.

(3) Mainstreaming of ecosystem-based approaches and tools into disaster risk reduction and development planning is needed.

- Two-step approach: (i) Define strategy and action plan and, (ii) establish the evidence base.
- Ongoing work on climate change adaptation at local level may be an opportunity to mainstream ecosystem-based approaches into DRR & development.
- Link to United Nations Development Assistance Framework (UNDAF) processes (Guidance notes available at: http://www.undg.org/?P=232).
- Conduct awareness raising activities at local level (seminars, workshops, publications) targeting particularly national programming staff working on ecosystem-based approaches and legislators.
- Use the Commission for Sustainable Development indicators (Guidelines available at: http://www.un.org/esa/dsd/dsd_aofw_ind/ind_csdindi.shtml).
- Facilitate partnerships among different agencies in the government and secure long-term commitment.
- Build on existing programmes for Resilient Cities.

(4) Valuing ecosystem functions and services (economic and non-economic) for disaster risk reduction needs to be identified/ clarified. Example references below.

- World Bank/ GFDRR "Natural hazards, un-natural disasters. The economics of effective prevention".
- Gund Institute for Ecological Economics (GIEE) (http://www.uvm.edu/giee/) and Professor Robert Costanza's work (http://www.uvm.edu/giee/?Page=about/Robert_Costanza.html&SM=about/about_menu.html).
- IUCN, Valuing Biodiversity. The economic case for biodiversity conservation in the Maldives (http://cmsdata.iucn.org/downloads/the_economic_case_for_biodiversity_in_the_maldives_1.pdf).

[1] UNDP's Bureau for Crisis Prevention and Recovery (BCPR) in close collaboration with the UN Office for Coordination of Humanitarian Affairs (OCHA) and the secretariat of the International Strategy for Disaster Reduction (ISDR) launched CADRI in June 2007. CADRI is the successor to the UN Disaster Management Training Programme (DMTP), which between 1990 and 2004, trained numerous UN staff members, government officials and civil society representatives.

- Natural Capital Project: InVEST: Integrated Valuation of Ecosystem Services and Tradeoffs (http://www.naturalcapitalproject.org/InVEST.html).
- The Economics of Ecosystems and Biodiversity (TEEB) study (http://www.teebweb.org).

(5) Initiating and strengthening the collaboration between scientists & practitioners for ecosystem-based disaster risk reduction is crucial.

- Message: Keep the momentum!
- Facilitate thematic working groups at country level (e.g. Jamaica).
- Training and awareness raising activities at national and regional level.
- Link to global and regional projects, programmes, networks and focal points.
- Keep the PEDRR website updated.
- Utilize the IUCN commissions.

Upcoming PEDRR activities for 2010 / 2011

- *Roundtable discussion "Managing forests and watersheds for natural hazard protection and livelihoods" to mark the International Day for Disaster Reduction, 13 October 2010, Genev.*
- *Submission of the PEDRR report "Demonstrating the role of ecosystems-based management for disaster risk reduction", as background document for Section 5 ("An enabling environment for risk reduction") of the 2011 ISDR Global Assessment Report (GAR) on Disaster Risk Reduction.*
- *Third session of the Global Platform for Disaster Risk Reduction, 11-13 May 2010, Geneva.*
- *Development of Environment-DRR training / capacity building for country-level decision makers and implementers*

Participants' Feedback on the workshop (SurveyMonkey evaluation)

- "Lots of discussions, excellent lessons "
- "DRR is something that is new to me and I quite enjoyed the presentation and the concepts and perceptions that was sharing during the 3-day meeting"
- "A very good start for future collaboration and activities"
- "Brought together a wide array of approaches and experiences through different participants- rich discussions!"
- "It left me thinking and developing new ideas and provided input for current work"
- "There should be more examples from ¨real practitioners" such as the Kyrgzstan project"
- "Having a few more participants from donor institutions and national DRR agencies would be useful. We need national-level representation too"
- "Need to improve focus and scope of break-out group discussions. Simplify questions, make them more concrete"
- "Keeping discussions in focus was hard, because of the diversity of knowledge and experiences among participants"
- "At the beginning I thought it had been too ambitious. However, I think it is good to think big and being the first workshop on this topic, I think big and general was good."

Annex 1:
Participants list

No.	Surname	Name	Institution	Email address
1	Amin	Raquibul	IUCN Sri Lanka	raq@iucnsl.org
2	Ardakanian	Reza	UNU-ViE / UN-Water Decade Programme on Capacity Development (UNW-DPC)	ardakanian@unwater.unu.edu
3	Ariza	Clara	ProAct Network	clara.ariza@proactnetwork.org
4	Creitaru	Ioana	UNDP BCPR	ioana.creitaru@undp.org
5	Depietri	Yaella	UNU-EHS	depietri@ehs.unu.edu
6	Estrella	Marisol	UNEP	marisol.estrella@unep.org
7	Fernandez-Galiano	Eladio	European and Mediterranean Major Hazards Agreement (EUR-OPA), Council of Europe	eladio.fernandez-galiano@coe.int
8	Forge	Isabelle	Global Facility for Disaster Reduction and Recovery, The World Bank	iforge@worldbank.org
9	Fortuna	Serena	UNEP, Regional office of Asia Pacific	serena.fortuna@unep.org
10	Gareeva	Aida	NGO “Camp Alatoo“	aida@camp.elcat.kg
11	Garreau	Jean-Marc	IUCN	jean-marc.garreau@iucn.org
12	Gupta	Anil K	National Institute of Disaster Management	envirosafe2007@gmail.com
13	Held	Alex C.	GFMC and Working on Fire International	alex@wof-int.com
14	Hettiarachchi	Sam	University of Moratuwa, Sri Lanka	sslh@civil.mrt.ac.lk
15	Hirsch	Darya	UNU-EHS	hirsch@vie.unu.edu
16	Hoffmann	Anja A.	GFMC	aahoffmann@email.de
17	Hossini	Vilma	UNU-EHS	hossini@ehs.unu.edu
18	Jagannathan	Radhakrishnan	UNDP, New Delhi, India	j.radhakrishnan@undp.org
19	Kasymov	Ulan	University of Berlin, NGO “Camp AlaTtoo”	kasymovu@agrar.hu-berlin.de
20	Koch	Philipp	UNU-EHS	koch@ehs.unu.edu
21	Koloffon	Rebeca	UNDP Mexico	rebeca.koloffon@pmrpnud.org.mx
22	Lacambra Segura	Carmen	Research Unit (CCRU), University of	cl334@cam.ac.uk

No.	Surname	Name	Institution	Email address
			Cambridge, UK	
23	Lobos-Alva	Ivonne	UNEP	Ivonne.LOBOS-ALVA@unep.org, ivonnelob@yahoo.com
24	McAdoo	Brian	Vassar College, New York , USA	brmcadoo@vassar.edu
25	Micallef	Anton	Euro-Mediterranean Centre on Insular Coastal Dynamics	anton.micallef@um.edu.mt
26	Mordt	Matilde	UNDP Nicaragua	matilde.mordt@undp.org
27	Murti	Radhika	IUCN	radhika.murti@iucn.org
28	Mysiak	Jaroslav	FEEM	jaroslav.mysiak@feem.it
29	Navuku	Sanivalati	IUCN (Regional Office for Oceania)	sanivalati.navuku@iucn.org
30	Nikolov	Nikola	Faculty of Forestry, Macedonia	nnikolov@sf.ukim.edu.mk
31	Patra	Jyotiraj	KIIT-CEGS India	jyotirajpatra@gmail.com
32	Pattie	Douglas	UNCCD	DPattie@unccd.int
33	Price	Penny	Cape Town Municipality	Penny.Price@capetown.gov.za
34	Renaud	Fabrice	UNU-EHS	renaud@ehs.unu.edu
35	Rivera	Marco	IUCN	Marco.Rivera@iucn.org
36	Roper	Le-Anne	Government of Jamaica/Planning Institute of Jamaica	Le-Anne_Roper@pioj.gov.jm
37	Roy	Arghya Sinha	ADPC	arghya@adpc.net
38	Saalismaa	Nina	ProAct Network	nina.saalismaa@proactnetwork.org
39	Saarniaho	Karoliina	UNFCCC	KSaarniaho@unfccc.int
40	Saikia	Anshuman	IUCN	Anshuman.SAIKIA@iucn.org
41	Santoso	Heru	Indonesian Institute of Science	therunoff@yahoo.co.uk
42	Schansker	Maike	UNU-ViE	schansker@vie.unu.edu
43	Sharma	Sundar Prasa	Department of Water Induced Disaster Prevention (DWIDP), Ministry of Water Resources, Government of Nepal	sharmasp1966@yahoo.com
44	Snorek	Julie	UNU-EHS	snorek@ehs.unu.edu
45	Stal	Marc	GRF Davos	marc.stal@grforum.org
46	Sudmeier-Rieux	Karen	Commission on Ecosystem Management	karen.sudmeier@orange.fr

No.	Surname	Name	Institution	Email address
47	Szarzynski	Jörg	UN-SPIDER	Joerg.SZARZYNSKI@unoosa.org
48	Teya	Beatrice	UNDP-BCPR	beatrice.teya@undp.org
49	Thummarukudy	Muralee	UNEP	muralee.thummarukudy@unep.org
50	Thurman	Michael	UNDP Regional Centre for Europe and CIS, Almaty Office	michael.thurman@undp.org
51	Welle	Torsten	UNU-EHS	welle@ehs.unu.edu
52	Zehetmair	Swen	University of Bonn	zehetmair@geographie.uni-bonn.de
53	Zentel	Karl-Otto	DKKV	zentel@dkkv.org

Annex 2:
Ecosystem management for disaster risk reduction – Selected projects shared by workshop participants.
(Compiled by K. Sudmeier-Rieux, IUCN)

The following compilation of projects on ecosystem-based disaster risk reduction was possible thanks to the contributions made by Mr. Sundar Sharma, Mr. Michael Thurman and Mr. J. Radhakrishnan.

These case studies are part of an ongoing PEDRR activity that aims at documenting work that demonstrates knowledge generation, useful tools and effective methods, which can be shared as good practices and valuable lessons to promote ecosystem management for disaster risk reduction.

PEDRR encourages the submission of relevant case studies using the template available at www.pedrr.net

Project 1: Community-based Fire Management

Mr. Sundar Sharma
Soil Conservation Officer
Department of Water Induced Disaster Prevention (DWIDP)

Project background

In Nepal, community involvement and participatory approaches (Community-based Fire Management - CBFiM) are receiving increased interest.

Due to the lack of capability, appropriate planning and programming, most of the forests are experiencing 'uncontrolled forest fires.' These are putting the lives, properties and livelihoods of the local communities at risk, as well as damaging forest ecosystem.

It was be expected that development of an appropriate CBFiM planning and implementation mechanism would address the contemporary issues of forest fires, as well as institutionalise indigenous systems of fire management.

Project description

The two components of the project:

- Forest fire management training (7 days, 24 members of community forest users group)
- CBFiM Planning (5 year plan)

The project employed a 'participatory approach' for both the capacity-building and planning processes (see Fig 1). The project ensured that all concerned stakeholders were identified and that the local community was actively involved.

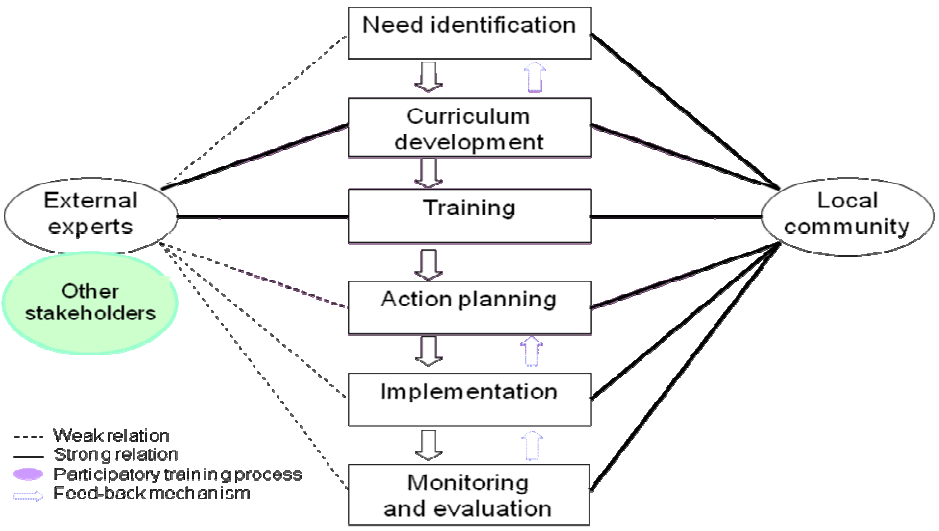


Fig. 1: Participatory training and planning process

Project outcomes and impacts

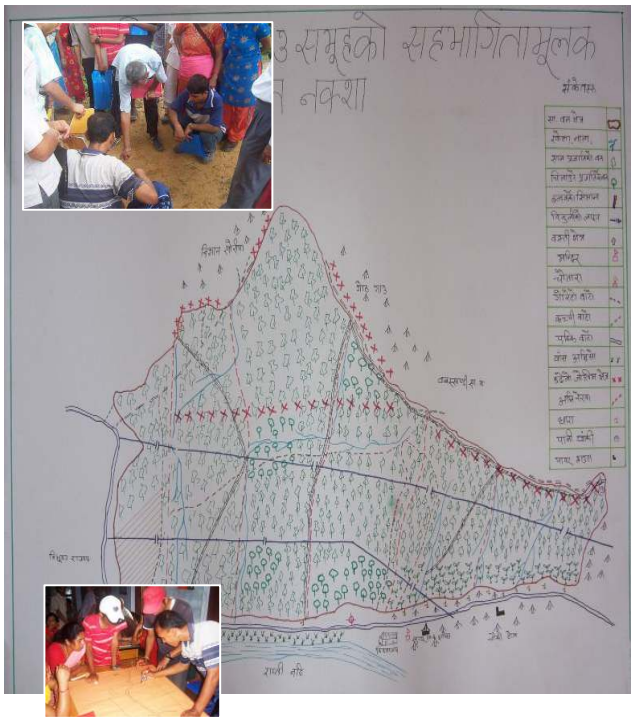
The main short-term outcomes for the project included capacity-building and local awareness-raising about fire management issues, as well as better overall community preparedness via a '5 year action plan' that became readily available.

The main long-term impacts for the project included a reduction in wildfires, increased disaster risk reduction, livelihood security for the local community and environmental protection.

Project outputs

The tangible results or outputs from the project or activity:

- Five-years action plan
- Capacity development (24 trained volunteer fire management group)
- Participatory resource map (PRM)
- Fire risk reduction map (FREM)



Participatory resource map (PRM) prepared by the local

Trained volunteer firefighter leader group

Project reflections

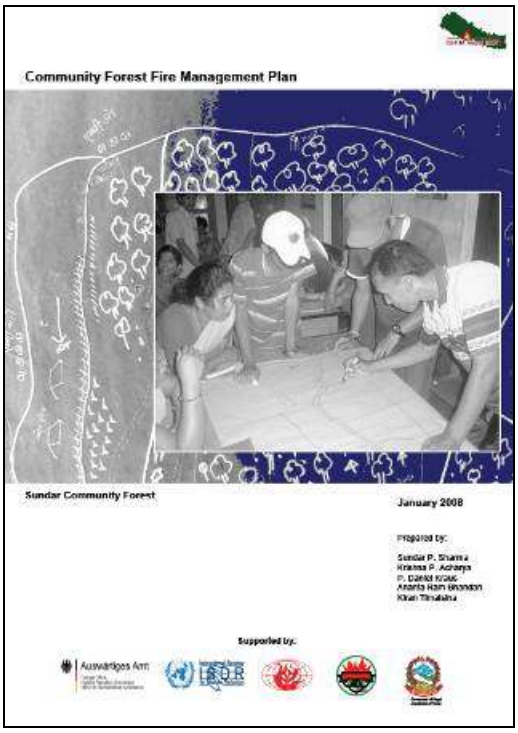
A critical evaluation of the project shows that most of the activities are being implemented, but some are not due to resource constraints of the user group.

Main accomplishments:

- Volunteer fire management group are serving as a trainer to nearby community forest user groups (CFUGs).
- Fire fighting tools (provided during the training) are being lent to nearby CFUGs.
- Triggering factors or causes of success or failure were identified and categorised into key priority issues, such as governance (policies, legal frameworks), capacity development, individual, commitment and charisma, partnerships, institutional mechanisms and resource needs.
- Participatory teaching and learning took place.
- A fire management action plan as a part of the community forest operation plan was developed.
- There is community ownership of the action plan.
- A 'need-based approach' was employed.
- The plan was prepared with low cost solutions, so it could be implemented utilising local resources.

Project lessons

Key lessons learned and priority areas of action highlighted a need for external support to implement the plan fully and replicate it to other parts of the country. It also emphasised that CBFiM could be an appropriate instrument or approach to ecosystem-based disaster risk reduction. Further study is still needed to see the impacts of the project with regards to other CFUGs. In other words, are they replicating the project idea in their forest; is the project self-driving?



Project 2: Capacity Building for Mitigating Climate Change Induced Disaster Risks in Tajikistan, 2010-2012

Mr. Michael Thurman
Regional Disaster Risk Reduction Advisor
ECIS, UNDP, Tajikistan

Projects' descriptions

Two initiatives are in their start-up phase:

- Collaboration between Tajikistan UNDP and UNEP Poverty and Environment Initiative and Tajikistan Disaster Risk Management Programme.
- Actors involved include: UNEP, UNDP Energy and Environment Group, UNDP Bureau of Crisis Prevention and Recovery, UN Country Office, national governments.
- Central Asia Multi-Country Programme on Climate Risk Management
- Actors involved include: UNDP Energy and Environment Group, UNDP Bureau of Crisis Prevention and Recovery; (more recently with project launch) International Fund for the Aral Sea; World Meteorological Organisation, national governments, World Bank (Central Asia Hydromet Modernization Program), International Water Management Institute
- UNEP, UNESCO, and UNHCR have been apprised of the Central Asia Multi-Country Programme on Climate Risk Management, but full consultations to identify areas of coordination and collaboration have not been conducted. Other relevant donors and international and local NGOs will also be consulted and brought on board, if feasible.

Projects' outcomes and impacts

Both initiatives are in start-up phase, so it is too early to report on tangible outcomes.

Expected long-term impacts with regards to areas of coordination and collaboration include:

- Strengthened risk assessment by government entities.
- Improved awareness among government and public concerning linkages between disaster risk reduction, the environment and livelihoods.
- Improved capacity to develop, execute, monitor and evaluate planning at national and district levels in which multiple benefits are obtained in disaster risk reduction, the environment and livelihoods.
- Pilot approaches developed at community level for further replication under the Communities Programme and upscaling by the government.

Projects' outputs

Regional:

- Technical capacity to manage climate-related risks and opportunities in an integrated manner at the multi-country level strengthened.
- Knowledge on adjusting national development processes to fully incorporate climate-related risks and opportunities shared at a national, multi-country and global level.

- Knowledge on glacial melting in Central Asia synthesised and further developed.

National:

- Institutional frameworks and technical capacity to manage climate change risks and opportunities in an integrated manner at the national, sub-national and local levels strengthened.
- Climate-resilient strategies, policies and legislation in priority sectors and geographic areas developed.
- Financing options to meet national climate change adaptation costs expanded at the national, sub-national and local levels.
- Climate change adaptation interventions in priority sectors implemented.
- Knowledge on how to incorporate climate change knowledge and risks into development processes at national, sub-national and local levels disseminated.

Projects' reflections

Project Next steps are as follows:

- Tajikistan UNDP and UNEP Poverty and Environment Initiative: work out the modalities for coordination and collaboration with Tajikistan Disaster Risk Management Programme and proceed with implementation.
- Central Asia Multi-Country Programme on Climate Risk Management: continue consultations with interested partners and begin the processes of creating networks of experts and conducting in-depth risk assessment.

Project 3: Post Tsunami Habitation Recovery project in Nagapattinam, India

Mr. J. Radhakrishnan
Assistant Country Director (Head DM Unit)
UNDP India

Project background

During the 2005 Indian Ocean tsunami Nagapattinam was highly impacted. Destruction covered 187 kilometres; however, 4,500 out of at total of 6,065 deaths occurred within a small stretch of 7 kilometres. Not only were lives lost, but the environment and coastal ecosystem was totally degraded. A recovery project thus was developed to incorporate environmental and coastal ecosystem management.

Driving Forces included:

- Impact of the disaster itself forcing people to re-evaluate their surroundings, livelihood security.
- The need to build back using the "build back better" approach.

Project description

Tools and methodologies used in development of the project included:

- The analysis of damage and needs assessment collected after the disaster by the Government.
- Incorporation of traditional and local knowledge with the coastal communities.
- Analysis of coastal contours.
- Community appraisals.
- Stakeholder discussions facilitated by NGOs and the Government.
- Revisiting existing regulatory laws.

Processes applied were a combination of community-based participatory consultations, inter-disciplinary and multidisciplinary coordination with the Government and NGO coordination, the creation of a resource centre after the Tsunami and enforcement of existing regulations.

Actors involved included:

- Local communities
- Government – local, provincial and national
- Well informed NGOs and civil society organisations (who were part of the NGO coordination and Resource centre)
- Funding agencies such as World Bank, ADB, IFAD, Multilateral agencies, such as UNDP, UNICEF and ILO

Actors who stayed outside the process included persons whose businesses were likely to be altered, such as local community persons taking up contracts for works in coastal areas and local community people who had encroached large-scale common property (community land and appropriated control of large areas were extensively against any change in the land use patterns even though they were illegally occupying the land).

Project outcomes and impacts

Expected long-term impacts or outcomes include influencing regulatory laws, protection of people and livelihoods from regular chronic coastal hazards, in addition to episodic events like tsunami, cyclone and floods.

- Improved demand driven land use methods complimenting the neglected existing regulatory frameworks which were revived post-tsunami, sustained coastal green belt initiatives and development of Community based joint plans were some of the long-term impacts.
- Impact of Tsunami was a catalyst in fast-tracking the Disaster Management Act 2005 passed by the parliament which put in place an institutional mechanism to handle disasters in a comprehensive fashion in comparison to the earlier response centric approach.
- The 'do no harm approach' advocated by the planning commission, incorporation of DRR features in recovery and national flagship programmes were a result of the enabling environment created in the after math of the extensive losses suffered in Tsunami.
- The NGO coordination and resource centre which was an inter agency mechanism and a bridge with the community and Government has now transformed into BEDROC- 'Building Resilience of Coastal communities' which continues to remain active. Government in its part has initiated a new project ' Vulnerability Reduction of Coastal Communities' to address the vulnerabilities of the households which were not affected by Tsunami but continue to remain vulnerable to coastal hazards with World Bank and Government funding complying all the environmental and social impact analysis addressing the ecosystem concerns.

Project outputs

- In addition to the primary focus on rebuilding shelter and habitations, community infrastructure and restoring livelihood, there was attention given to the creation of a green belt on the coast, restoration of sand dunes, decisions that would not damage or utilise the mangrove areas for any construction-related activities or reclamation of land under the recovery project.
- Healthy build-up of capacities in Climate Risk Management at the community-local and the Government level.
- Forestry was incorporated as an important constituent of the recovery project.

Project reflections

Acceptance and incorporation of environmental and, in effect, ecosystem concerns were a critical achievement. Normally, up until then, recovery projects generally focussed only on compensation and support for recreation of the assets and livelihoods lost without a review of environmental and accentuating circumstances and larger ecosystem concepts.

Project lessons

Participatory processes:

- Community involvement and NGO Government coordination worked; however, in a community, there are a lot of pressure groups with vested interests, which many times work counter to the project's purposes.
- Including the local community leaders in the formal village-level committees when recovery and land issues were decided helped; participatory and Consultative approach worked.
- Providing information impartially to the people and allowing them to arrive at a decision by allowing them to analyse the pros and cons and long-term prospective gains and losses, rather than immediate benefits, helped.
- Putting in place a vibrant NGO Coordination and Resource centre serving, as a bridge between the community and the Government, helped.
- Inclusion and making approvals by the local community mandatory while selecting land for recovery related projects made the system institutional; the village community included local non-formal leaders, grassroots-level elected representatives, and local self-help groups in addition to the standard governmental participation.
- Insistence of the Government and the external aid agencies, such as the World Bank, to include the environment and social impact assessment acted as a catalyst to ensure its inclusion.
- Top down approach of preaching did not work and talking of regulation alone did not work.
- The charisma of the team leaders appointed was also instrumental in facilitating the community participation at the field levels.

Local factors:

- Setting up of NGO Coordination centre was a triggering factor.
- Having a multi-disciplinary and joint post-disaster needs assessment by UN, WB, ADB and others, in addition to the standard Government damage and needs assessment, helped in bringing to light the environmental perspectives.
- Government putting in place 11 Area teams headed by senior Government officials covering seven villages each to cover the stretch of 73 habitations was instrumental in reaching out to all at the grassroots level.

Policy and legal frameworks:

- The Government and the donors, such as the World Bank, insisting on compliance and all the existing environmental and regulatory laws were critical in catalysing the already accepted view of taking up environmentally compliant recovery.

Resources and resource utilisation:

- Resource needs were met by funds from the State and the national government apart from the formal Emergency Tsunami recovery project
- Additional assistance from the World Bank, Asian development Bank and the IFAD was also acquired.

- Regarding cost-benefits, the environmentally sustainable reconstruction has helped in insuring safety community from future extensive losses in the event of a cyclone, flooding or another Tsunami and also created more livelihood opportunities.

Planning, implementation and monitoring:

- A sea wall was built as part of the rebuilding of the minor port at Nagapattinam covering the heavily damaged Akkarapettai village, but apart from being cost prohibitive, it had an impact on the next village Kallar where massive erosion was reported.
- The green shelter belt with *casuarina* plantations were cost-effective as wave breakers and also reduced the erosion.
- Sea wall also increased flooding from landward side after rains. Luckily it was limited to the minor port area.
- Sustainability was built into the programme through the green belt programme, which is now incorporated in regular forestry projects.
- The local level Disaster Management Plans also recognize the need to take up mitigation activities incorporating safety and promoting environment and ecosystem concerns.
- The coastal ecosystem should not have been exploited indiscriminately such as by damaging the sand dunes, mangroves and construction without reference to contours; doing so proved extremely dangerous.
- Ensure that the ecosystem-related concerns are regularly debated from the village-level to the district-level prior to revision of Disaster Management Plans.
- All new projects need to be evaluated with reference to the environment and ecosystem concerns.
- Capacity-building of local field-level government officials on a regular basis is a must.
- Could also consider including forward-looking reflections, next steps and or immediate follow-up activities.
- Need to constantly update the community and the other stakeholders, including Government and NGOs.
- Ecosystem and environmental impacts of human activity is now necessary since short-term, immediate gains from an ecosystem sometimes blinds the local stakeholders from medium-term and long-term impacts.
- All future development activities and livelihood generating activities should include an ecosystem impact assessment at least as a self-check certification process.
- Should always have constant concurrent third party evaluation of development activities on ecosystem level impacts to ensure that the planned outputs, outcomes and the impacts do not drift.