

# Ecosystems and community resilience: the co-benefits of partnerships

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**E**cosystems are our lifeline; they are the basis for human well being and human security. In addition to their well-known contribution to livelihoods, healthy ecosystems can reduce vulnerability to natural hazards, and they are our first line of defence in adapting to climate change. Protecting these vital services will take the combined efforts of disaster managers, development practitioners and environmental managers. This chapter begins to consider the benefits of adopting an integrated approach to the issues of ecosystem management, sustainable development, disaster risk reduction and climate change adaptation, and points to the need for stronger partnership between practitioners and stakeholders in these fields.

Over the last decade, the global community has come to recognize that the ever-increasing impact of natural hazards such as floods, wildfires, hurricanes and earthquakes poses serious challenges to development. In addition to the devastating toll measured in human lives and suffering, disasters erode, and in many cases, reverse hard-earned gains in terms of political, social and educational progress, as well as infrastructure and technological development. Often it is the poorest and least developed countries that are hardest hit. Guided by the 'Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters', the global community is moving to reduce disaster risk as an integral and necessary component of sustainable development and climate change adaptation.



Cooperative efforts to plant and conserve mangroves in places like Indonesia protects an important ecosystem service for local residents

## Environmental degradation

*The Millennium Ecosystem Assessment (MEA)*<sup>1</sup>, which involved the work of more than 1,360 experts worldwide, provides compelling evidence that ecosystems are essential for human well being through the services they provide. These 'ecosystem services', or the benefits people obtain from ecosystems, include provisioning of products such as food, fuel and fibre; regulating services such as climate regulation and disease control; and nonmaterial benefits such as the spiritual or aesthetic.

The demand for ecosystem services has grown at an unprecedented rate. Between 1960 and 2000 the world population doubled to 6 billion people and the global economy increased more than six-fold. Increased demand for services (food production increased roughly 2.5 times; water use doubled; wood harvests for pulp and paper production tripled) corresponds with dramatic changes in the Earth's ecosystems. The last two decades alone have witnessed the loss of 35 per cent of global mangroves. The MEA reports that forests have now effectively disappeared in 25 countries and another 29 have lost more than 90 per cent of their forest cover.

In parallel, work by many organizations within the environmental community has advanced a broader understanding of the linkages between the health of the environment and the extent of human loss, suffering and economic damage resulting from natural hazards. Healthy ecosystems provide natural defences; for example, wetland ecosystems function as natural sponges that trap and slowly release surface water; mangroves, dunes and reefs create physical barriers between communities and coastal hazards, and forests play a critical role in soil stabilization and influence the risk of floods and landslides. Simply stated, healthy ecosystems can reduce human vulnerability to natural hazards — degraded environments commonly amplify the negative impacts.

The need to reverse environmental losses and the attendant consequences on poverty are reflected in the Millennium Development Goals (MDGs), particularly MDG 7 which calls for, among others, integration of the principles of sustainable development into national policies and programmes; a reversal in losses of environmental resources, and the reduction of biodiversity loss.



Image: UNEP

The condition of ecosystem services have direct effects on livelihoods

### Climate change

Designing development interventions without consideration of how climate change will affect programme outcomes is no longer an option. The Intergovernmental Panel on Climate Change (IPCC) *Fourth Assessment Report* affirms that “since the IPCC Third Assessment, confidence has increased that some weather events and extremes will become more frequent, more widespread and/or more intense during the 21st century; and more is known about the potential effects of such changes.” Climate change will also affect the underlying vulnerabilities of communities worldwide. The report, for instance, indicates that “for increases in global average temperature exceeding 1.5-2.5°C and in concomitant atmospheric carbon dioxide concentrations, there are projected to be major changes in ecosystem structure and function, species’ ecological interactions, and species’ geographical ranges, with predominantly negative consequences for biodiversity, and ecosystem goods and services.”<sup>2</sup>

As the governments of the world work toward a new international climate change agreement to follow the Kyoto Protocol, they have drafted the ‘Bali Action Plan’ which was adopted at the United Nations Climate Change Conference in Bali in December 2007. The Bali Action Plan calls for enhanced action on adaptation, including consideration of “disaster reduction strategies and means to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change.”

### Co-benefits and the efficiency of an integrated approach

Patterns of disaster risk are already changing and the critical ecosystems that support community resilience are being lost at an alarming rate due to human mismanagement as well as changes in climate. An integrated approach to climate change adaptation, disaster risk reduction and ecosystem services must be adopted if development programmes and the MDGs are to be achieved. Evaluating the effects of interventions in one field of development programming on others can lead to mutually beneficial outcomes.

The idea of co-benefits has been used widely in discussions of climate change, referring specifically to ‘joint primary benefits resulting from the selection of one instrument aimed at reaching several targets’, and is used as a means to weigh options through benefit-cost analyses in the policy selection process.<sup>3</sup> This approach is equally useful when looking at community vulnerability and resilience. In this sense, ‘co-benefits’ refer simply to multiple benefits in different fields resulting from one policy, strategy or action plan. Achieving co-benefits requires integration or the overt design of development programmes to meet multiple needs: poverty alleviation, protection of ecosystem services and biodiversity conservation, disaster risk reduction and climate change adaptation.



Image: UNEP

Uninhibited deforestation makes development unsustainable and has a large price for both present and future generations

Integrated programming in these fields has a solid economic basis. While failure to adopt an integrated approach can be counter-productive to the goals of any of these areas of intervention, seeking co-benefits is an efficient means of utilizing funds.

#### Disaster risk reduction

The goal of disaster risk reduction as described in the Hyogo Framework for Action is “the substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and states.” Risk reduction involves a broad range of interventions including such diverse measures as developing early warning systems, ensuring safe building practices, public awareness and spatial planning.

Maintaining the protective services of healthy ecosystems is an important contribution to disaster risk reduction. A review carried out by IUCN as part of the ‘Mangroves for the Future’ initiative points to studies that have calculated these contributions. In Sri Lanka, for example, each square kilometre of mangroves has been estimated to provide USD8,000 in storm protection.<sup>4</sup> In Indonesia, mangroves provide USD600 per household in coastal erosion control,<sup>5</sup> and in Southern Thailand mangroves offer USD3,000 per hectare in coastline protection and stabilization.<sup>6</sup> The work of the climate change adaptation community enables us to characterize future risk and helps to revitalize commitment to integrated planning and field level action.

Disaster risk reduction is inherently multi-sectoral, but also requires actions at various scales. Efforts to build national level capacities and political commitment need to be complemented by work to extend the capacity of field-level practitioners who are capable of designing and delivering risk reduction measures at the community level. The disaster risk reduction community will benefit from an integrated approach since it provides access to and leverages the

efforts of the very large and well-established global environmental-sustainable development community, which has been working on the ground in most of the world’s poorest and vulnerable countries for several decades.

#### Environment and sustainable development

Over 30 years ago in Stockholm, world leaders agreed on the urgent need to respond to the problem of environmental deterioration. Twenty years later, in 1992, at the United Nations Conference on Environment and Development in Rio de Janeiro, world leaders agreed that the protection of the environment and social and economic development are fundamental to sustainable development and adopted a global programme entitled ‘Agenda 21’. In 2002, world leaders met again and laid out a plan for implementing the agenda and again recognized that poverty eradication, changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development.<sup>7</sup>

Environmental managers employ a wide range of approaches and instruments in their efforts. Economic valuation of ecosystem services is one approach that can assist planners to better understand the costs and trade-offs of proposed development interventions. Every loss of ecosystem services has a livelihood cost for local communities, neighbouring communities and future generations. The cost falls disproportionately upon the poorest communities who rely heavily on primary resources for their livelihoods, and who often have less access to government-sponsored protection from natural hazards. While the



Image: UNEP

Climate change is expected to increase the frequency of extreme climate events, including prolonged dry periods and, in many areas, increased risk of wild land fires

actual dollar values are case-specific, mostly comparing to alternative manmade structural measures to achieve somewhat definitive price tags for a particular ecosystem service, it is conclusive that changes in these services affect human well being in many ways.<sup>8</sup> Often the ecosystem services are undervalued, particularly when considering the disproportionate value to local and poorer communities.

Environment-sustainable development practitioners certainly benefit from growing demand for maintaining the ecosystem services that accompany efforts to promote community resilience in a changing climate; they also benefit from the refined instruments, methods and field-based actions prompted by the disaster risk reduction and climate change adaptation communities. But perhaps the greatest benefit of disaster risk reduction and climate change adaptation to the goals of environmental and sustainable development is the increased likelihood that these development programmes will not be derailed by costly diversions of human, natural and financial resources that inevitably accompany disasters.

### Climate change adaptation

Efforts to mitigate or reduce greenhouse gas emissions need to be complemented by efforts to adapt to climate change. The IPCC defines adaptation as ‘adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.’<sup>9</sup> Other definitions treat an adaptation as a process or the outcome of a process that leads to a reduction in harm or risk of harm associated with climate change and variability<sup>10</sup> or efforts to ‘moderate, cope with and take advantage of the consequences of climatic events.’<sup>11</sup>

Because the consequences of climate change, in some regions, will include increased damages from sea-level rise, flooding, drought and other climate-related hazards, the capacity to reduce disaster risk provides governments with a first line of defence in adapting to a

changing climate. Similarly, efforts to protect ecosystems services, particularly those efforts that anticipate the impacts of climate change on ecosystems and design their interventions accordingly, are a second cornerstone of adaptation. Ecosystems are essential to human well being, and the demand for these services will continue to grow as communities around the world take steps to moderate, cope with and take advantage of new conditions.

### Concluding thoughts

The considerations presented in this chapter offer an initial view of benefits derived from adopting an integrated, partnership based approach. Ecosystems are our lifeline; the changes that have been made to them have contributed to overall improvements in human well being and economic development, but these improvements have been achieved at a cost. The degradation of ecosystem services has not only exacerbated poverty for some groups of people, it has also exacerbated their vulnerability to natural hazards.

The target population for development assistance often coincides with the population facing the most loss in times of disaster; so partnering knowledge and capacities and visibly integrating disaster risk reduction as one distinct but increasingly important ecosystem service adds significantly to the economic rationale for the maintenance of healthy ecosystems. Disaster risk reduction, environment, sustainable development and climate change adaptation all need an inter-sectoral approach. There are many co-benefits that can be achieved through creating partnerships; there are many collateral costs of not doing so.