Name of Project: Ecosystem-based Adaptation (EbA) in Marine, Terrestrial and Coastal Regions as a Means of Improving Livelihoods and Conserving Biodiversity in the Face of Climate Change

NWP work areas to which the pledge is relevant: Methods and tools; data and observations; climate risks and extreme events; socio-economic information; adaptation planning and practices; research; and economic diversification

Overall objectives: Improve understanding and assessment of impacts, vulnerability and adaptation to climate change, including climate variation and extremes in three locations (Philippines, South Africa and Brazil); measure outcomes and create lessons learned; and inform policy and decision making on policy to support practical adaptation actions and measures from the local to international scale.

Background: Ecosystem-based adaptation (EbA), or ecosystems supporting human adaptation, is an important approach critical for environmental and human resilience to climate change. EbA focuses on ecosystem services as these provide multiple adaptation benefits, and can be more cost effective than hard infrastructure. However, decision-makers often have more access to information on hard infrastructure investments in comparison to the value and efficacy of ecosystem services or natural capital. To provide more information on the value of ecosystems and their services in climate adaptation, CI is committed to learning from work in the field and communicating to governments the important role ecosystems play in adaptation and how participatory processes that engage local stakeholders can inform ecosystem-based adaptation.

To increase the resilience and adaptive capacity of vulnerable communities to climate change, CI will assess the potential for EbA solutions in the Philippines, South Africa, and Brazil. By implementing EbA efforts in these diverse ecosystems and different contexts, the lessons learned can provide guidance to an array of future adaptation work. In each of the three countries, we will evaluate vulnerabilities, and identify two pilot EbA activities to implement in order to test the effectiveness of EbA in each context.

Philippines' Target Region: Verde Island Passage (VIP)

The VIP is located within the Sulu-Sulawesi Seascape and is part of the Coral Triangle, an area considered to be the center of the world's marine biodiversity. VIP's population of over 1.7 million people, which is expected to grow rapidly within the next decade, depends heavily on marine resources for livelihood, including fishing, aquaculture and tourism. As climate change intensifies, the existing problems of overfishing and coastal erosion will also become more pronounced. These climate change induced stresses will exacerbate local communities' vulnerability to climate change through increased food, water, and health insecurity.

Conservation International (CI) and partners conducted a Vulnerability Assessment (VA) in 2009 in the national government, local government and academe, during which high priority actions were identified to address the adverse effects of climate change and the critical resources at risk. These included: addressing coastal flooding and erosion from intense rainfall and sea level rise; improving the resilience of local livelihoods; and building resilience of local fisheries.

Project Purpose: Based on the assessment, CI and local partners will implement two EbA initiatives in the region: coastal protection and enhancement of fisheries and livelihoods resilience. The coastal protection initiative will restore mangroves in coastal areas vulnerable to increased storm events and sea surface temperature. The fisheries and livelihoods initiative will improve fishing practices and use marine protected areas (MPAs) to expand the habitats, which are essential for the maintenance of diverse fishery stocks on which local communities are dependent for their well being. Target areas for the two initiatives include mangroves, seagrasses and coral areas. Outcomes from the initiatives will be shared with local, national and international policy makers to bring more clarity to the benefits of ecosystem services in adapting to climate change.

Activities:

Coastal Protection

- Conduct Vulnerability Assessment to address susceptibility of mangroves, coral reefs, and seagrass ecosystems as well as human communities to climate change impacts
- Engage local stakeholders to facilitate sharing of valuable local knowledge and optimize their involvement in and ownership of mangrove planting, monitoring and maintenance
- Develop policy and legal instruments that facilitates the reversion of abandoned ponds to mangrove forests
- Implement income diversification strategies designed to prevent degradation of mangrove forests as well as conversion of mangrove areas into other uses.

Resilience of Fishing and Livelihoods

- Support policy development for adaptive fishing technology and application of best fishing practices to improve efficiency
- Design and implement income diversification strategies that reduce human vulnerability and simultaneously increase resilience in the form of increase in education levels, and implementation of conservation agreements
- Protect habitats essential for the maintenance of fish stocks through marine protected areas

Expected Results:

- Improved understanding of conditions of seagrasses, mangroves, and coral reefs through mapping and field surveys
- Strengthened local capacity to oversee EbA-based management of coastal ecosystems especially mangrove areas
- Improved understanding of EbA fisheries practices for fishermen and other stakeholders
- Income diversification strategies and options, including conservation agreements and sustainable financing
- Completion of lessons learned activities (workshops, interviews, reports, etc.) that engage and inform policy making
- Incorporation of results from lessons learned analysis of pilot activities into national and international policy dialogue, especially the UNFCCC and other international and national events, roundtables, capacity-building exercises, and other relevant channels.

Indicators of Success

- Increase in capacity of local communities and government on EbA-based management of coastal areas
- Instances of benefit sharing and sustainable financing
- Area of mangrove restoration
- Contribution to the achievement of the sustainable development goals articulated in the Philippine's 12-year National Framework Strategy and Program on Climate Change
- Instances in which international climate change policymaking bodies incorporate these lessons learned into decision-making
- Establishment of climate resilient MPAs
- Numbers of fisherman trained in implementing EbA fisheries management and practices

South Africa's Target Region: Namaqualand

This semi-arid region in the Northern Cape has a relatively small population of roughly 125,000 but faces severe water scarcity and land degradation challenges. The Northern Cape is the third most environmentally degraded area in South Africa due to run-away over-grazing and soil erosion, infestations of invasive alien plant species, and the overdevelopment of wetlands. These problems will only intensify with the progression of climate change, which threatens to significantly advance desertification in the region over the next 50 years.

Vulnerability to climate change in the region is closely tied to the availability of ecosystem services related to water availability and grazing, upon which livelihoods depend. These services will be greatly enhanced and made more resilient by ecosystem-based approaches including restoration. Furthermore, the application of EbA options will be important where the predicted increase in severe coastal winds and storms reduces the viability of hard infrastructure solutions such as bridges and ports. Conservation South Africa (CSA) will coordinate with various stakeholders and leverage existing scientific work in the region to design EbA efforts specially tailored to Namaqualand's unique socio-geological context. In addition, CSA intends to support policy development by integrating adaptation efforts into local planning, as well as adaptive natural resource management practices focused on grazing lands, freshwater resources, and national policy where appropriate.

Activities

Piloting Innovative approaches for EbA in Livestock Grazing and Freshwater Management

- Completion of Vulnerability Assessment to identify the sensitivity and level of exposure of the region's communities as well as its key ecosystem services, freshwater systems, and grazing lands to the impacts of climate change and identify critically vulnerable areas to prioritize for adaptation action
- Implementation of a participatory research program with at least two representative communities within the landscape to enhance understanding of the ways in which healthy environments contribute to climate resilience
- Identification and negotiation of community governance options for the implementation of specific EbA management actions such as livestock reduction, removal of feral donkeys, fencing of critical wetlands, removal of alien invasive species, and reduction of inappropriate ploughing techniques
- Restoration of high priority wetlands and grazing lands
- Development of a long-term monitoring system to evaluate and measure the social, economic and ecological benefits of adaptation actions in relation to climate change
- Tracking of the relative cost-effectiveness of EbA relative to business as usual and/or other climate resilience options

Integrating EbA Efforts into Local Planning

- EbA lessons learned from pilot activities will be shared with planners and integrated into local policy frameworks and government operations as appropriate. This will be facilitated by participation in policy development processes and training sessions with local economic development and municipal officers
- A 'lessons learned' booklet will be created and distributed to facilitate the consideration of EbA in the region's development policy and planning processes

Expected Results

- Increased community awareness of EbA, particularly the role of wetlands and healthy natural areas for grazing in providing ecosystem services for improved resilience to climate change
- Effective communication to decision makers of the value of ecosystem services, the socio-economic benefits of restoration activities, and the contributions these make to increased climate resilience
- Increased support and funding for existing programs that enable climate resilience, such as a "Working for Adaptation/Restoration" forum to be ultimately overseen by the National Expanded Public Works Programme
- Long term sustainability after completion of the pilot activities and overall strengthened capacity of local communities to manage their natural resources in an uncertain climate
- Communication of lessons learned to appropriate policymakers in order to guide and improve future climate change adaptation projects in South Africa
- Prevention of maladaptation - those adaptation efforts that create unintended negative consequences - resulting from an enhanced understanding of the role of ecosystem services in adaptation to climate change

Incorporation of results of the lessons learned from the individual pilot activities into national and international policy dialogues such as the UNFCCC, CBD and Rio +20 conventions, including side events, roundtables, and other capacity building exercises.

Indicators of Success

- Long term sustainability and local management of the "Working for Adaptation/Restoration" or similar program after the completion of pilot activities due to increased capacity and buy-in
- Area of grazing lands and wetlands restored
- Increase in income, beneficial livelihoods diversification, support for EbA, and food and water security for participating communities
- Level of integration of EbA efforts into national, regional and international policy
- Number of policy frameworks incorporating EbA approaches, including South Africa's National Climate change response Framework including adaptation plans and Economic Growth and Development Strategy as well as local disaster management and development plans.
- Case studies and data from Namaqualand District included in the Nairobi Work Programme and discussed at other relevant fora

Brazil's Target Area: Southern Bahia/Abrolhos (SBA)

Southern Bahia/Abrolhos (SBA) is home to the largest forest remaining within the northeastern area of the Atlantic Forest biome, and the largest and most biologically diverse coral reefs in the Southern Atlantic, which are part of the Abrolhos Seascape. Nearly 20,000 people subsist on the fisheries, and another 80,000 live off tourism revenues in the region. There is also a rich history of wood collection for firewood, fuel wood and crafts. This translates into multiple stressors for ecosystems and their services in the area that are critical for protecting people and species from climate change impacts.
Reefs and forests in this region are highly susceptible to climate change. Research suggests that forest fragmentation in this area has already begun to influence rainfall patterns and climate change will intensify the change in rainfall patterns. Fragmentation, in conjunction with increased temperatures, may alter the necessary conditions of forest maintenance, thereby affecting already compromised water supplies.

Additionally, reduced forest connectivity exacerbates water insecurity for local communities. Warming and increased sedimentation has also continued to increase the incidences of coral bleaching and coral disease, which decrease fishery productivity. This negatively impacts food security and marine biodiversity. For these reasons, the implementation of EbA approaches addressing the interdependence of terrestrial-marine ecosystems is a high priority for improving climate change resiliency in the region. CI and local partners will conduct a vulnerability assessment (VA), identify, and implement EbA pilots to address fisheries and forest connectivity to protect ecosystem services as adaptation measures. The VA will identify and engage communities and locations most at risk to climate change and variability.

Activities

EbA Vulnerability Assessment

- Consult stakeholders in assessment design
- Conduct and summarize research on climate change impacts, human well-being, livelihood and ecosystem vulnerability, including cognitive mapping, GIS mapping of coastal communities and vegetation mapping
- Organize and conduct stakeholder and expert workshops to review and invite feedback on gathered data with the hopes of refining the information.
- Consult stakeholders and experts in identifying two priority projects to be implemented based on VA outcomes
- Incorporate results from lessons learned analysis and individual pilot activities into national and international policy dialogue, especially the UNFCCC, side events, roundtables, capacity-building exercises and other vehicles

Possible Pilots

A. *Coastal Resilience*
- Build EbA into land use plans for areas at risk of sea level rise
- Develop EbA tools for income diversification to reduce dependence on specific fish populations

B. *Marine Resilience*
- Create integrated networks of sustainable production
- Revise MPAs to include areas more resistant to bleach and coral diseases based on vulnerability mapping

C. *Forest Connectivity*

- Integrate EbA into forest restoration plans
- Demonstrate importance of connectivity to human well being

Expected Results

- Presentation of proposal for revised SBA Protected Areas Network to the Government of Brazil.
- Restoration of the terrestrial and marine ecosystems will support human well being and enhanced income security for communities whom depend heavily on the services provided.
- Creation of recommendations on implementing strategies for building resilience and adaptive capacity to sea level rise, changing ocean temperatures, disrupted forest hydrological regimes, reduced ocean productivity and increased integration of land and marine ecosystem management.
- Increase understanding and use of EbA by decision makers in development considerations.
- Improve "South-South" capacity building and guidance, for national, regional and international climate policy forums.
- Enhance technology and information sharing on EbA. This will build on Brazil's Forest Protection in Mata Atlântica II, "The Pact for Restoration of Atlantic Forest" and the "Ecological Corridors Project" as part of the Pilot Program for the Protection of Brazilian Tropical Forests- PPG-7."

Indicators of Success

- Number of priority recommendations integrated into adaptive management plans for the region
- Land use planning instruments adopting management recommendations based on the Vulnerability Assessment and EbA lessons learned
- Number of Protected Areas adopting management recommendations resulting from the Vulnerability Assessment
- Increase in local communities' income, food and water security