

# ECOSYSTEM-BASED ADAPTATION THROUGH SHOUTH-SOUTH COOPERATION

## GOOD PRACTICE CASE STUDY

### Community-based adaptation to climate change through coastal afforestation

Case study compiled and edited by: C4Ecosolutions, May 2015



Bangladesh is not a significant contributor to climate change. However, it is one of the countries considered most at risk from the predicted effects of climate change. In particular, communities in the coastal areas of Bangladesh are vulnerable to increased frequency and severity of climate-related events such as cyclones, tornadoes and floods. The vulnerability of coastal communities is exacerbated by high levels of poverty and a heavy reliance on natural resource-based livelihoods. The Government of Bangladesh (GoB) implemented the first global GEF-LDCF (Least Developed Countries Fund) adaptation project, entitled “Community-based adaptation to climate change through coastal afforestation (CBACC-CF)” to reduce climate-induced vulnerability in coastal areas through enhancing resilience of communities and protective ecosystems.

Under this project, the GoB implemented multiple climate change adaptation interventions in four pilot sites, focusing on restoration and replanting of degraded mangrove and wetland areas. The project resulted in the creation of paid work opportunities for community members while generating multiple socio-economic and environmental benefits.

## Project outcomes

- Livelihood diversification for over 85,000 people through training in plantation techniques and management, as well as implementing cash-for-work programmes.
- Increased siltation and coastal surge protection in mangrove plantations at pilot sites, providing improved protection against climate change-related storms, tidal surges and other disasters along an extent of 14 km of coastline.
- A new rational land use model that offers a new way to restore barren coastal lands productive.
- Generation of lessons and best practices to inform replication and up-scaling across Bangladesh, in the region and internationally.

## Key lessons

- This project was jointly implemented by multiple agencies and managed by various stakeholders. Consequently, cooperation between all stakeholders – including government ministries – is integral to the implementation of adaptation projects.
- Support from local communities was an important aspect contributing to the success of this project. Community participation can be promoted through the overlap of EbA and community-based adaptation – i.e. reducing the vulnerability of relevant ecosystems while empowering local communities.
- Educating and training local communities on EbA – and thereby increasing their adaptive capacity to climate change – promotes the success of adaptation projects.
- Adaptation to climate change can be integrated into existing restoration activities.
- Limited community support for the project is a potential barrier to its successful implementation.



## GOOD PRACTICE DESCRIPTION

**LOCATION:** Four coastal forest districts in Bangladesh, including Chittagong (Eastern Region), Noakhali (Central Region), Bhola (Central Region) and Barguna and Patuakhali (Western region). The selected upazilas within these districts include Anwara, Hatia, Char Fassion and Barguna Sadar respectively.

**IMPLEMENTATION PERIOD:** March 2009–April 2013 (extended to 2014)

**OPERATIONAL BUDGET:** US\$5.4 million

**KEY STAKEHOLDERS:** GEF, UNDP and Government of Bangladesh. Implementing partners of the project are: Bangladesh Forest Department, Bangladesh Forest Research Institute, Ministry of Land, Department of Agriculture Extension, Department of Livestock Services and Department of Fisheries.

### Background information and climate change vulnerabilities

Mangroves are integral to coastal ecosystems in Bangladesh because they provide a physical barrier that protects against damage from severe cyclones and tidal surges. However, many mangrove areas in Bangladesh have been degraded as a result of: i) cyclonic wind damage; ii) succession or regeneration failure; iii) human demand for livelihoods; and iv) commercial shrimp farming. Consequently during 1960–2000, the spatial extent of mangroves in Bangladesh decreased from 142,853 ha to 132,000 ha. The loss of mangrove vegetation negatively affects the coastal ecosystems and the well-being of local communities whose livelihoods depend upon mangroves for forest products, agriculture and fishing.

The threat of climate change to Bangladesh's socio-economic development and well-being is described in the country's National Adaptation Programme of Action (NAPA) – which identifies national priorities and threats to be addressed as part of a national climate change response – and Initial National Communication (INC) – which reports on the current and projected effects of climate change in the country. These national documents identified economic constraints and widespread poverty as two important limitations to the country's ability to adapt to climate change and climate-related hazards. Consequently, the NAPA prioritised coastal afforestation through community involvement as a simple and cost-effective approach to adapt to the negative effects of climate change in coastal areas.

### Intervention technologies

The project was implemented in four coastal forest districts which were identified as being particularly vulnerable to extreme weather events, the frequency and intensity of which were expected to increase. Traditionally, a single pioneer mangrove species, *Sonneratia apetala*, has been used extensively in Bangladesh in newly accreted lands because of its ability to withstand immersion for 3-4 days. However, climate change has negatively affected the growth rate and survival of monoculture mangrove areas. Therefore, the project implemented enrichment planting within mangrove areas. Nine commercially important mangrove species were introduced to monoculture mangrove areas. The purpose of this planting was to increase the density of the trees and prevent damage from high winds and other weather events. A variety of adaptation measures were promoted and demonstrated during the project's implementation, including *inter alia*:

- mangrove plantations on newly accrued lands. These plantations were established on mounds created from soil cuttings. This soil is extracted from one side of the mound, resulting in the formation of a pit in close proximity to the mound. Gradually, this pit will be filled with silt as a result of the movement of tide water. This technique protects seedlings from water logging and water stress. In addition, the mounds are covered by



- sods, helping to protect them from soil erosion caused by rain or tidal water;
- model plantation of nine new mangrove varieties;
  - non-mangrove mound plantations on newly accreted lands;
  - dyke plantation including the Forest, Fish, Fruit (FFF) model in moderate to highly accreted lands. This technique is suitable for sites near saline water sources. A dyke is created by excavating earth to form a sloped structure, consisting of a ridge and ditch. The ridge is used to support plantations while the ditch can be converted into a pond for fish culture. This multi-functional dyke and ditch technique is termed the “3F Model”; and
  - strip plantation on roadsides in project sites.

### **Description of the results**

The adaptation interventions and livelihood development measures expanded the livelihood options for coastal communities and supported the conservation of coastal resources. Consequently, this project increased the ability of coastal communities to adapt to climate induced threats while simultaneously mitigating the effects of climate change.

The project's accomplishments – as at the end of 2013 – included the establishment of:

- i) 8,500 ha of mangrove areas by engaging 178,500 man days in cash-for-work programmes;
- ii) 112 ha of dyke plantations by engaging 66,630 man days and involving 896 families through land allotments;
- iii) 322 ha of mound plantations by engaging 97,260 man days and involving 554 beneficiaries through long-term benefit sharing agreements;
- iv) 615 km of strip plantations have been completed with the involvement of 3,075 beneficiaries; and
- v) 150ha model demonstration plantation of nine mangrove species. In addition, over 12,000 people were trained in mangrove nursery production and community-based nursery and plantation management. Furthermore, ~1,400 coastal beneficiaries were trained in improved technologies for agriculture, aquaculture and livestock.



## GOOD PRACTICE ANALYSIS\*

### Knowledge building

*How has the project built upon or applied the findings of specific research projects? How has the project actively contributed to international understanding on Ecosystem-based Adaptation?*

An important feature of this project was the participation of coastal communities in the implementation of Ecosystem-based Adaptation (EbA) activities, with simultaneous investments in enhanced capacity and knowledge. Implementation of the FFF model supported knowledge building as it promoted adaptation interventions that improved proactive planning and the exchange of information to manage the risks of climate variability. Moreover, the FFF created an institutional interface to provide climate change information in an integrated manner, thereby providing guidance to government and the general public to support information-based adaptation planning.

Various publications and web information were produced through the project's knowledge management activities. Project information has been added to the global Adaptation Learning Mechanism for public dissemination. In addition, field trips and field visits were organised with national and international delegates to communicate the innovations and successes of the adaptation practices.

The planned establishment of a Coastal Adaptation Learning Centre (CALC) will institutionalise on-the-ground experiences of adaptation practices in Bangladesh. The CALC will be instrumental in promoting collaboration among academics and researchers. Moreover, it will be beneficial for sharing knowledge and first-hand experiences of adaptation.

### Political ownership, collaboration and approval

*How has the project secured support from political-level stakeholders and aligned its activities with wider development agendas to trigger further collaboration opportunities?*

Climate change and climate-related hazards are recognised by the Government of Bangladesh as a limitation to economic growth. In addressing climate change, the project focused on: i) developing partnerships with stakeholders to strengthen institutional capacity; and ii) mainstreaming sustainable environmental management into policies and planning. Therefore, the project was aligned with Bangladesh's national priorities and received strong support from stakeholders at the central, district and local levels.

The management of restored mangroves provided opportunities for the development of land use models. Since the project's inception, land has been made available for community initiatives. Landless people and marginalised groups of society – including female headed households – have been granted access to government lands through a benefit-sharing model, thereby providing landless households with a resource to support livelihoods such as agriculture. Beneficiaries entered into a ten year land ownership agreement, with the option for renewal dependent on their performance. The opportunity for landless households to increase their income increased the financial security of these previously marginalised communities.

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\* This analysis is based on the "principles of good practice" developed by the EU/FP7-funded project AfriCAN Climate (2011-2014). These principles represent critical cross cutting issues shared by the majority of climate change projects, regardless of focus, scope and scale. They are intended to encourage critical reflection and help project developers and decision-makers draw out relevant lessons. Source: <http://africanclimate.net/en/good-practice/8-principles-good-practice>



The community management approach is conducive to members sharing their knowledge and good practices among themselves. They are also able to exchange information with other groups in the area and other parts of the coast. The community management of coastal land resources contributes towards the development of equitable ownership and inclusive resource governance.

The project organised meetings with local government departments to share lessons learned and to sensitise these stakeholders to the importance of promoting alternative livelihood models and replication of successful adaptation practices identified by the project. As a result, the coastal land use policy is under review to delineate land ownership and incorporate climate change considerations in dynamic coastal zone management.

### **Building local capacities**

*How has the project ensured that local capacity was built during implementation phase? Explain how training programmes were integrated into core project activities and the measures taken to assure that built human capacity is maintained beyond the project's lifetime.*

The technical capacity of government staff has been strengthened through the development and implementation of: i) several communication materials; ii) three training modules; and iii) eight technical training modules. In total, the project provided training to 153 district and 233 upazila officials. In addition, 60 district officials have visited the project implementation sites.

Activities that strengthened the technical capacity of local communities included providing training in mangrove nursery production and plantation to ~12,000 people received training in mangrove nursery production and plantation. In addition, 1,142 people received instruction on improved agricultural technologies. Furthermore, 220 households participated in demonstrations, 60 households received training in aquaculture and 470 households received training in livestock livelihoods.

Co-management committees (CMCs) were established. These include representatives of local government, local community leaders and concerned government agencies and are headed by the Chief Executive Office of sub-district. The purpose of these CMCs is to facilitate the implementation of project activities, manage conflict resolution and provide policy and legal support as needed by the project.

