



## United Nations Development Programme

Country: BANGLADESH

### PROJECT DOCUMENT

**Project Title:** Integrating Community-based Adaptation into Afforestation and Reforestation Programmes in Bangladesh

#### UNDAF Outcome(s):

Outcome 5.1: By 2016, populations vulnerable to climate change and natural disaster have become more resilient to adapt with the risk.

Outcome 5.2: By 2016, vulnerable populations benefit from natural resource management and environmental governance and low emission green development

**UNDP Strategic Plan Environment and Sustainable Development Primary Outcome:** Promote climate change adaptation

**Executing Entity/Implementing Partner:** Ministry of Environment & Forests

**Implementing Entity/Responsible Partners:** Bangladesh Forest Department

Programme Period:	2014-2018	Total resources required	\$52,650,000
Atlas Award ID:	00075892	Total allocated resources:	\$52,650,000
Project ID:	00087558	• LDCF (GEF)	\$5,650,000
PIMS #	4878	• Co-financing	
Start date:	January 2014	o GoB	\$35,000,000
End Date	January 2018	o USAID	\$10,000,000
		o UNDP	\$2,000,000
Management Arrangements	NIM		
PAC Meeting Date	25 August 2013		

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Ministry of Environment & Forests (MoEF) / Bangladesh Forest Department (BFD)

Date/Month/Year

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Date/Month/Year

### **Brief Description**

Coastal greenbelts have long been seen as an important strategy for reducing the vulnerability of coastal populations to climate-related hazards in Bangladesh and the country has over five decades experience of coastal afforestation and reforestation. Over 140,000 ha of mangroves have been planted along the coast since the 1960s. However, the success of afforestation and reforestation efforts has been highly variable due to a range of institutional, technical and socio-economic factors that have affected their long-term sustainability. A number of barriers currently prevent the realisation of the full adaptive potential of coastal greenbelts, including an underlying incentive structure that drives people to exploit and degrade coastal forests rather than preserve them. LDCF support will be used to help the Government of Bangladesh overcome these barriers through a suite of complementary measures to achieve the project's objective of reducing the vulnerability of communities to the adverse impacts of climate change in the coastal zone through participative design, community-based management and diversification of afforestation and reforestation programmes. The project has been designed to complement a major new programme on coastal afforestation and reforestation funded by the Bangladesh Climate Change Resilience Fund (BCCRF).

Project Component 1 addresses existing barriers relating to lack of livelihood diversification and lack of coastal forest diversification, both of which adversely impact coastal forest sustainability. Thus Component 1 seeks to reduce the vulnerability of local communities in new afforestation and reforestation sites through livelihood diversification more effective greenbelts, by a) linking livelihood diversification interventions to improved coastal forest stewardship and b) diversifying coastal plantations to increase their ecological and social sustainability by, respectively becoming more heterogenous and dense and by increasing the range of tangible benefits the forests can provide. Component 2 seeks to strengthen community engagement and ownership of forestry-based adaptation and climate risk reduction programmes by developing and demonstrating effective co-management and benefit-sharing for coastal greenbelt plantations. Finally, while mangrove greenbelts are a vitally important adaptation measure for coastal areas, there will always remain a need for complementary measures to further protect human lives and livelihoods assets in the face of extreme climate events. In recognition of this, the third Project Component focuses on protecting communal livelihood assets in afforestation and reforestation sites from extreme climate events through effective early warning and preparedness planning. Altogether, over 60,000 vulnerable people will benefit from a range of LDCF-supported interventions. Capacity development of local communities and key government actors is central to the project approach and will enhance the long-term sustainability of project impacts. Furthermore, the project will leverage strategic partnerships with the BCCRF project, USAID's Climate Resilient Ecosystems and Livelihoods project (CREL) and the GoB's Comprehensive Disaster Management Programme, also supported by UNDP, to promote scale up and replication of successful strategies.

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## List of Acronyms and Abbreviations

ADPC	Asian Disaster Preparedness Centre
AIT	Asian Institute of Technology
ALM	Adaptation Learning Mechanism
ADPC	Asian Disaster Preparedness Centre
AF	Arannayk Foundation
APR	Annual Progress Report
AWP	Annual Workplan
BCCRF	Bangladesh Climate Change Resilience Fund
BCCSAP	Bangladesh Climate Change Strategy & Action Plan
BDT (Tk)	Bangladesh Taka (national currency)
BFD	Bangladesh Forest Department, MoEF
BFRI	Bangladesh Forest Research Institute
BMD	Bangladesh Meteorological Department
BRDB	Bangladesh Rural Development Board
BWDB	Bangladesh Water Development Board, MoWR
CARE	Christian Action Research and Education
CBA	Community Based Adaptation
CBACC	Community-based Adaptation to Climate Change through Coastal Afforestation in Bangladesh (1 <sup>st</sup> LDCF-funded project)
CBO	Community Based Organization
CBDRM	Community-based Disaster Risk Management
CBDRR	Community-based Disaster Risk Reduction
CC	Climate Change
CCA	Climate Change Adaptation
CDSP	Char Development & Settlement Project
CF	Conservator of Forests
CCF	Chief Conservator of Forests
CEGIS	Center for Environmental and Geographic Information Service
CGIAR	Consultative Group on International Agricultural Research
CDMP	Comprehensive Disaster Management Programme
CMC	Co-Management Committee
CO	Country Office (of UNDP)
CP	Country Programme
CPP	Cyclone Preparedness Programme
CREL	Climate Resilient Ecosystems and Livelihoods
CRPARP	Climate Resilient Participatory Afforestation and Reforestation Project
CPAP	Country Programme Action Plan
CSO	Civil Society Organization
CZP	Coastal Zone Policy
DAE	Department of Agriculture Extension
DDM	Department of Disaster Management
DDMC	District Disaster Management Committee
DEFDC	District Environment and Forest Development Committee

DFO	Divisional Forest Officer
DLS	Department of Livestock Services
DMC	Disaster Management Committee
DoE	Department of Environment
DoF	Department of Forests
DPM	Disaster Prevention and Mitigation
DRM	Disaster Risk Management
DRRO	District Relief and Rehabilitation Officer
DSC	District Steering Committee
ERC	Evaluation Resource Centre (of UNDP)
FCD	Flood Control and Drainage
FCDI	Flood Control, Drainage and Irrigation
FFF	Fish-Fruit-Forest
FFWC	Flood Forecasting and Warning Center
FRMG	Forest Resource Management Group
GDP	Gross Domestic Product
GEF	Global Environment Facility
GoB	Government of Bangladesh
ha	Hectare
HDI	Human Development Index
ICZM	Integrated Coastal Zone Management
IFAD	International Fund for Agricultural Development
INC	Initial National Communication to the UNFCCC
IPAC	Integrated Protected Area Co-Management
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
LDC	Least Developed Country
LGED	Local Government Engineering Department, MoLGRDC
LDCF	Least Developed Countries Fund
MACH	Management of Aquatic Ecosystems through Community Husbandry Project
MDG	Millennium Development Goal
MFF	Mangroves For the Future
MoA	Ministry of Agriculture
MoDMR	Ministry of Disaster Management and Relief
MoEF	Ministry of Environment & Forests
MoF	Ministry of Food
MoFL	Ministry of Fisheries and Livestock
MoLGRDC	Ministry of Local Government, Rural Development and Cooperatives
MoWR	Ministry of Water Resources
MTE	Mid-term Evaluation
NAPA	National Adaptation Programme of Action
NGO	Non-governmental Organization
NPD	National Project Director
NPDM	National Plan for Disaster Management
NPM	National Project Manager

NTFP	Non-Timber Forest Products
PA	Protected Area
PB	Project Board
PEI	Poverty and Environment Initiative
PIO	Project Implementation Officer
PIR	Project Implementation Review
PMU	Project Management Unit
PPG	Project Preparation Grant
PRF	Project Results Framework
PRSP	Poverty Reduction Strategy Paper
QPR	Quarterly Progress Reports
RD&CD	Rural Development and Cooperative Division, MoLGRDC
SLR	Sea level rise
SNC	Second National Communication
SPCR	Strategic Programme on Climate Resilience
TAG	Technical Advisory Group
TST	Targeting & Selection Strategy
TOR	Terms of Reference
ToT	Training of Trainers
UDCC	Upazila Development Coordination Committee
UDMC	Union Disaster Management Committee
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VCA	Vulnerability Capacity Assessment
WARPO	Water Resources Planning Organization, MoWR



# I SITUATION ANALYSIS

## Brief country overview

1. The People's Republic of Bangladesh is a low-lying country in South Asia, located between 20° and 27° N and 88° and 93° E. The country has a total area of 147,570 km<sup>2</sup> and is bounded by India to the west, north and northeast, Myanmar to the southeast and the Bay of Bengal to the south. Hilly terrain covers only some 12% of total land area in the north/northeast and southeast, with average elevations of 244m and 610m, respectively.<sup>1</sup> Most of the country lies below 12 metres in altitude and c. 80% consists of floodplains and wetlands created by the more than 300 rivers and channels that flow through it, including the major river systems of the Ganges, the Brahmaputra and the Meghna. Approximately two-thirds of the Ganges-Brahmaputra-Meghna delta, which covers c. 80,000 km<sup>2</sup>, is located in Bangladesh, the rest in neighbouring West Bengal state of India.

2. Climate is subtropical and heavily influenced by the southeast monsoon, which generates significant rainfall and high humidity. Four seasons can be distinguished: a hot humid, rainy monsoon season from June to September; a progressively cooler, drier season from October to November; a cool dry winter from December to February; and a progressively hotter and drier summer from March to May. Average annual temperatures vary between 18-29°C. However, maximum summer temperatures vary between 38°C-41°C, while winter temperatures generally vary more, by between 10°C at night and 16-20°C in the day. Average annual rainfall ranges from 1,429 mm to 4,338 mm, with the bulk of annual rainfall (c. 80%) occurring during the monsoon.

3. Bangladesh's major natural ecosystems include terrestrial forest ecosystems, coastal and marine ecosystems and inland freshwater ecosystems. Wetlands, which include both inland and coastal systems, and a variety of different types of lakes, mudflats, mangrove forests and other ecological systems, are the country's most significant natural ecosystem. Forest cover had declined by more than 90% over the past 100 years and per capita forest area is amongst the lowest in Asia.<sup>2</sup> Although some 2.56 million ha of land is classified as forests (according to Forestry Sector Master Plan 1993), representing 17.8% of the country's total area, according to the latest FAO Forest Resource Assessment, only around 11% of the country is under tree cover, while another 20% is classified as 'other wooded land', which includes trees within homestead farms and other agricultural tree crops (FAO 2010). Natural and planted mangroves form an important part of the coastal zone. Natural mangroves cover an estimated 584,000 ha (representing 39.2% of all classified state-owned forest land) and occur mainly in the Sunderbans Reserve on the western part of the coast, a globally renowned transboundary national park and UNESCO World Heritage Site. Mangrove plantations cover some 137,080 ha and represent 9.2% of all classified state-owned forest land.<sup>3</sup>

4. For administrative purposes, Bangladesh is divided into seven Divisions, which are further divided into 64 Zillas or Districts. The country's capital is Dhaka. Rural areas have another two administrative tiers below the District level, namely Upazillas (Subdistricts) and Union

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<sup>1</sup> UN-REDD Programme 2012. *Bangladesh REDD+ Readiness Road Map*. Draft. April 2012.

<sup>2</sup> MoEF/GoB 2012. *Rio +20 National Report on Sustainable Development*.

<sup>3</sup> World Bank 2013

Parishads. The latter are further divided into electoral wards. The ten largest cities are administered by eleven City Corporations while other urban areas have Pourashavas or Municipalities. There are currently nearly 500 Upazillas, 4,500 Unions and over 300 Pourashavas. All administrative tiers below the Division level have elected Parishads or Councils including some reserved seats for women. Upazila and Union Parishads generally cover populations of around 260,000 and 27,000 on average.<sup>4</sup>

5. Bangladesh has a population of nearly 160 million people and with 1,015 people/km<sup>2</sup> on average, population densities are among the highest in the world. Although fertility rates have declined greatly, the population is projected to reach 220 million by 2040 at the current population growth rate of 1.34% per annum.<sup>5</sup> Around 75% of the population is rural and a significant proportion (c. 35 million or 22%)<sup>6</sup> lives in the 710 km coastal belt along the Bay of Bengal, which covers over 47,200 km<sup>2</sup> or 32% of total land area.<sup>7</sup> Over 98% of the population is Bengali and predominantly Bangla-speaking, the rest being mainly indigenous tribes from the Chittagong Hill Tracts. Some 90% of the population are Muslim, the rest are mainly Hindu, Christian or Buddhist.

6. With a per capita GNI of US\$838 in 2012-13, Bangladesh is still among the Least Developed Countries (LDCs) of the world. Nonetheless, the country has made tremendous progress in economic and social development in recent decades and is on track to achieve most of its Millennium Development Goals (MDGs) by 2015. In 2013, Bangladesh has moved one point higher placing it in the 146<sup>th</sup> position out of 187 countries in the world. Bangladesh is among the 18 countries of the world including China, India, Malaysia and Vietnam that have been making great strides in the human development sectors.<sup>8</sup> Noteworthy development achievements include: sustained and remarkably resilient economic growth over the last decade (on average 5.8% per annum growth in GDP); reductions in the poverty headcount ratio from nearly 48.9% in 2000 to 31.5% in 2010<sup>9</sup> and an estimated 26% in 2015 (2.5% lower than the MDG goal<sup>10</sup>) and achieving gender parity in primary and secondary education at the national level (with regional variations).<sup>11</sup> However, an estimated 50 million people still live in poverty, including a significant proportion living in extreme poverty (c. 17.6% of the total population<sup>12</sup>). More than two-thirds of the rural population is landless or effectively landless (i.e. own less than 0.2 hectares of land). Some 50% of the population depend directly on a rapidly degrading natural resource base for their livelihoods and various subsistence products including food, fodder and fuel. Reducing maternal mortality and chronic malnutrition also remains a challenge.<sup>13</sup>

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<sup>4</sup> Commonwealth Local Government Forum. 2013.

<sup>5</sup> MoEF/GoB 2012 *Rio +20 National Report on Sustainable Development*; World Bank 2010. *Country Assistance Strategy for the People's Republic of Bangladesh For the Period FY11-14*.

<sup>6</sup> Population figure from World Bank. 2010. *Country Assistance Strategy for the People's Republic of Bangladesh For the Period FY11-14*. 35 million said to be in coastal belt: 35/160 =22%

<sup>7</sup> PDO-ICZMP, 2004. *Where Land Meets the Sea: A Profile of the Coastal Zone of Bangladesh*; and Bangladesh Bureau of Statistics 2001 Census

<sup>8</sup> UNDP 2013.

<sup>9</sup> BBS Household Survey 2010

<sup>10</sup> Bangladesh Poverty Assessment Report, World Bank, June 2013

<sup>11</sup> World Bank 2010. *Country Assistance Strategy for the People's Republic of Bangladesh For the Period FY11-14*

<sup>12</sup> BBS Household Survey

<sup>13</sup> MoEF/GoB 2012. *Rio +20 National Report on Sustainable Development*; UNDP 2011 *UNDP Country Programme for Bangladesh (2012-16)*; World Bank 2010. *ibid*

7. In terms of land use, Bangladesh remains a predominantly agrarian nation. The Ganges-Brahmaputra-Meghna delta is not only the world's largest and most populous delta, but also one of its most fertile. Agriculture occupies nearly 76% of total land area and cropping is dominated by rice. Bangladesh once had over 12,000 varieties of rice but has lost more than 50% of these over the last 50 years.<sup>14</sup> Annual rice production has nearly trebled between 1971 and 2007/8 as a result of being transformed from low input subsistence systems to intensive farming systems that rely on new rice varieties and a greater level of inputs, including irrigation during the dry winter season. Fisheries, aquaculture and salt production are also important economic activities in the coastal zone along with seasonal floodplain cultivation. Over 60 million people are estimated to rely on aquatic resources to varying extent. An estimated 1 million people are fulltime fishers, while a further 11 million undertake part-time fishing. A major proportion of people's protein requirements is met through fish and crustaceans, which are of particular importance for the nutritional security of the poor.<sup>15</sup>

8. While agriculture still employs the largest proportion of the labour force (c. 47.3%<sup>16</sup>), its contribution to GDP has been declining and is now only around 13.6%<sup>17</sup>. The fisheries sector is estimated to employ around 5% of the workforce and contributed some 3.56% of GDP in 2012-13<sup>18</sup>, it also makes a significant contribution to export earnings.<sup>19</sup> Over 50% of GDP is generated through the services sector and a little under 30% by the industrial sector.<sup>20</sup> Remittances and the export-led garment industry have been the twin drivers of the Bangladesh economy in recent years. These now account for over two-thirds of export earnings.

9. While the Bangladeshi economy has proved resilient to date, it remains vulnerable to the effects of the global economic downturn since it relies heavily on developed country markets for its export garments as well as to other local shocks, particularly the impacts of major natural disasters or sudden increases in the prices of food and fuel as happened in 2007 and 2008, respectively.

10. Bangladesh is also one of the most disaster-prone countries in the world and the most disaster-prone of the LDCs. The country is frequently subjected to cyclones, extreme weather events and storm surges, which in turn often lead to riverine and coastal flooding and saline intrusion and exacerbate existing problems of coastal erosion. Of the 250,000 deaths resulting from cyclones worldwide between 1980-2000, 60% occurred in Bangladesh.<sup>21</sup> Cyclones are especially common before and after the monsoon, in May and October, respectively. Recent well-known events include supercyclone Sidr in 2007 and cyclone Ayla in 2009. However, in the past two hundred years, the coastal zone has been affected by at least 70 major cyclones, of which 40 have occurred since 1948. The most serious ones in terms of fatalities were in 1970, with 250,000 deaths and 1991, with 138,882 deaths.<sup>22</sup> Eighty percent of annual rainfall occurs during the monsoon months and flooding is a major recurring problem that affects between 30-

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<sup>14</sup> MoEF/GoB 2012. *Rio +20 National Report on Sustainable Development*,

<sup>15</sup> Parveen and Faisal 2001 in MoEF 2004. *National Biodiversity Strategy and Action Plan for Bangladesh*.

<sup>16</sup> BBS Labour Force Survey 2010

<sup>17</sup> BBS 2013, using GDP at current price

<sup>18</sup> BBS 2013

<sup>19</sup> Parveen and Faisal 2001 in MoEF 2004. *National Biodiversity Strategy and Action Plan for Bangladesh*

<sup>20</sup> Bertelsmann Stiftung, 2012. *BTI 2012 - Bangladesh Country Report*. <http://www.bti-project.org>; UN-REDD 2012 Programme 2012. *Bangladesh REDD+ Readiness Road Map*. Draft. April 2012

<sup>21</sup> World Bank 2010. *Country Assistance Strategy for the People's Republic of Bangladesh For the Period FY11-14*.

<sup>22</sup> According to the statistics of Disaster Management Bureau of GoB. <http://www.dmb.gov.bd/pastdisaster>

50% of the country each year. Between 1991 and 2000, 93 major disasters were recorded, resulting in nearly 200,000 deaths and causing at least US\$5.9 billion in damage with severe losses to agriculture and infrastructure. Climate change, which is discussed separately in Section 1.2 and in Annex 1, is likely to further exacerbate Bangladesh's existing vulnerability to natural hazards.

11. Better disaster preparedness strategies and practices have reduced the numbers of deaths due to disasters, but the loss of assets and livelihoods remains very high (estimated to be as much as 0.5-1% of annual GDP<sup>23</sup> while the damages from Cyclone Didr were \$1.7 billion or 2.6% of GDP), with women being most acutely affected. There is concern that continued population increase, environmental degradation and climate change could undermine further development and reverse recent hard-won achievements.

### **The climate change induced problem**

12. As a low-lying country with a large area of deltaic floodplains, Bangladesh is well-recognized as being particularly vulnerable to the impacts of climate change. While the country has become better equipped to deal with climate-related variability and disasters over the past decades, climate change effects are projected to change the frequency, intensity and location of existing climate hazards and thus challenge people's existing coping mechanisms. Multiple natural disasters compounded with other vulnerability factors have particularly marginalized coastal communities, who are among the poorest in the country, and at the same time slowed down social and economic development processes.

13. Observed long-term temperature changes within Bangladesh suggest an annual rate of temperature increase of 0.04<sup>0</sup>C during monsoonal periods. A significant increasing trend in the frequency of cyclones over the Bay of Bengal during cyclone months has also been observed in recent decades<sup>24</sup>. Fishing in the Bay of Bengal, a key source of income and protein for the poor, as well as important contributor to GDP, is becoming more and more risky and unsafe due to increasingly erratic, harsh weather conditions at sea. Cyclones with storm surges and associated precipitation inundate coastal polders and cause water logging in areas around the coastal embankment, affecting agricultural production including aquaculture and salt production.<sup>25</sup> Available climate change models suggest that the intensity of super cyclonic events will increase over the coming decades, with increasing risks to coastal populations and livelihoods from high winds and storm surges.

14. Those living in coastal areas are also especially vulnerable to the effects of sea level rise (SLR), coastal erosion and salinization. Climate change projections suggest that a rise in global temperature of 4<sup>0</sup>C is likely to raise sea level by 100 cm by 2100, which would inundate 15% of the country's land area and displace tens of millions of people. Meanwhile, historical tidal data from various coastal measurement stations suggest that the rate of SLR in Bangladesh is many orders of magnitude higher than the global mean projected rate of SLR over coming decades

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<sup>23</sup> Economics of Adaptation to Climate Change in Bangladesh published by World Bank in 2010

<sup>24</sup> For example, see SM M. Rana, Md. Kamruzzaman, M.A. Rajib and Md. M. Rahman. (2011). Changes in Cyclone Pattern with Climate Change Perspective in the Coastal Regions of Bangladesh. *Environmental Research, Engineering and Management*. No. 2(56), P. 20-27. The authors report that the last 52 years saw a five-fold increase in the number of cyclones compared with the previous 57 years.

<sup>25</sup> Ahmed 2005a; Institute for Water Modelling (IWM) and Centre for Environmental and Geographic Information Services (CEGIS) 2007. *Impacts of Sea Level Rise on Coastal Community and Livelihoods*; salt pans are located mainly in Chittagong & Cox's Bazaar Districts

(cf: 4.0 mm/year at Hiron Point, 6.0 mm/year at Char Changa, and 7.0 mm/year at Chittagong). A 45 cm SLR, could result in the inundation of 10-15% Bangladesh's land by 2050, resulting in over 25 million climate refugees from the coastal districts.<sup>26</sup> With a 1m rise in sea level, the Sundarbans, the world's largest natural mangrove forest and a UNESCO World Heritage Site, would likely be lost, which would affect not only unique coastal ecosystems and their biodiversity, but also thousands of poor households that currently rely on a range of ecosystem services supplied by the Sundarbans.

15. Existing problems of saline intrusion would be further aggravated by SLR and high winds, which would result in seawater overtopping existing coastal protection measures such as embankments and submerging polders with disastrous consequences for local agriculture and livelihoods.<sup>27</sup> Salt water from the Bay of Bengal is already reported to have penetrated 100 km or more along tributary channels during the dry season in past years.<sup>28</sup> Approximately, 1.02 million ha of arable lands have been affected to varying degrees by soil salinity, and vast areas of croplands in the lower estuary of the coast remain fallow during the dry (*rabi*) season due to high salinity.<sup>29</sup>

16. The Government of Bangladesh (GoB) is acutely conscious of the country's vulnerability to climate change. Current and future climate-related risks to Bangladesh and key areas of vulnerability have been analyzed in the country's Initial National Communication (INC) to the United Nations Framework Convention on Climate Change (UNFCCC) and the 2005 National Adaptation Programme of Action (NAPA), which was further updated in 2009. A more detailed climate risk profile for Bangladesh is provided in Annex 1.

## **Coastal afforestation & reforestation on newly accreted *Char* lands**

17. Bangladesh has nearly five decades of experience of coastal afforestation and reforestation, including on offshore islands and newly accreted lands. Coastal plantations were originally planted mainly to protect coastal populations against tidal bores, cyclones and storm surges with the first plantations developed in 1966 in the intertidal zone outside the coastal embankment.<sup>30</sup> However, some of the additional values of such plantations soon became apparent, notably their potential to speed up the stabilization of newly accreted lands, increase the productivity of estuarine waters, and protect interior agricultural land from saline intrusion.

18. Stabilization of newly accreted lands, known locally as *chars* (or *chaurs*), has become an increasingly important driver of coastal afforestation given the acute shortage of land in this densely populated, agrarian country. Active delta-building occurs mainly in the Meghna estuary, which is located in the central part of the coastal zone. Sediment discharged here by the three major rivers flowing into the delta, the Ganges in particular, but also hundreds of lesser rivers, contributes to delta formation through the accumulation of fertile alluvial soils. As sediments are deposited in the nearshore zone, they are reworked and redistributed by wave and tide action to form new land in the form of sand bars, mud banks and islands, or to increase the area of

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<sup>26</sup> Climate Change Cell, DoE, Bangladesh

<sup>27</sup> CEGIS, 2006. *Impacts of Sea Level Rise on Landuse Suitability and Adaptation Options, Final Report*

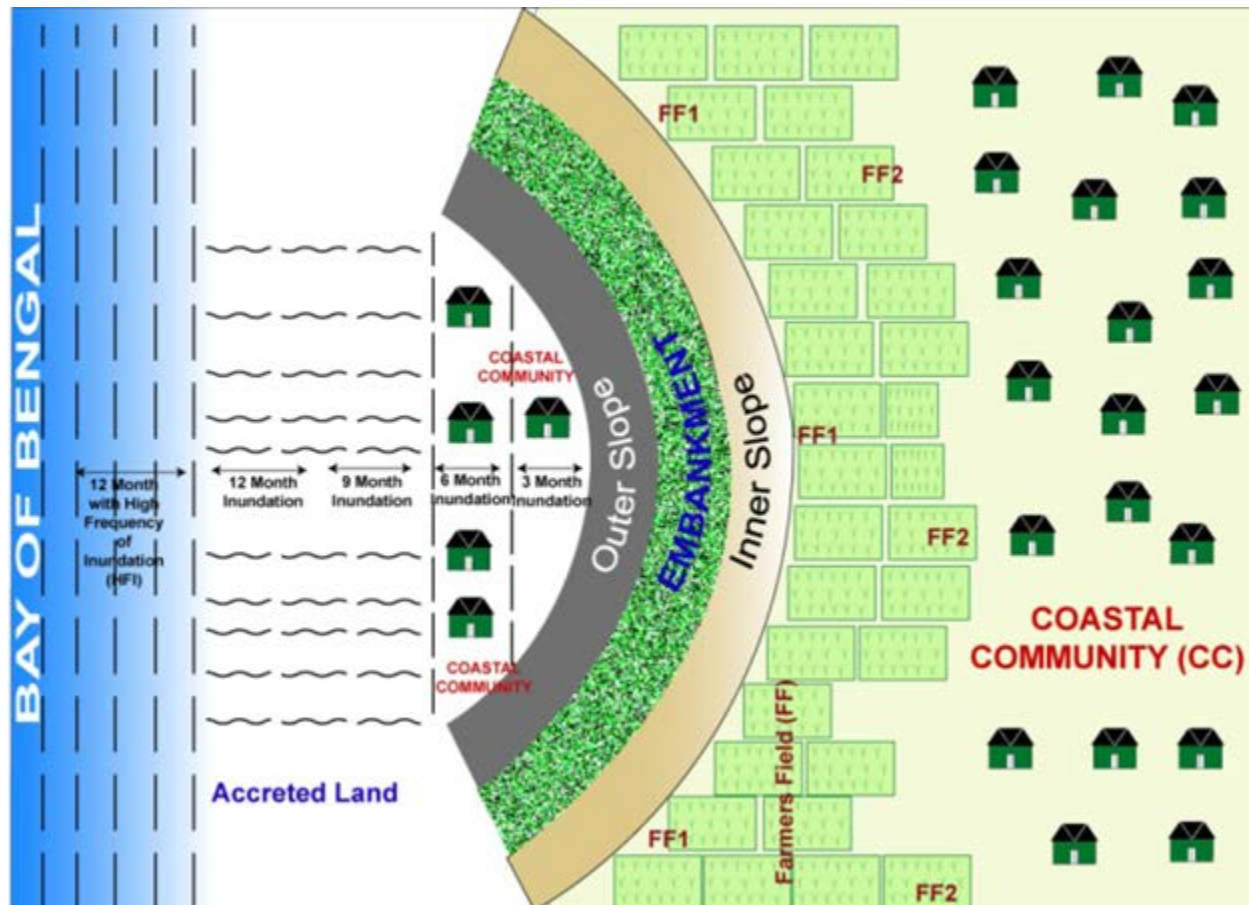
<sup>28</sup> IPCC, 2007. *Climate Change 2007*

<sup>29</sup> Soil Resources Development Institute (SRDI), Bangladesh

<sup>30</sup> I. U. Ahmad 2012. Status of mangrove plantations in the living delta: an overview of the coastal afforestation experience of Bangladesh. In: Macintosh, D.J., Mahindapala, R., Markopoulos, M. (eds) (2012). *Sharing Lessons on Mangrove Restoration*. Bangkok, Thailand: Mangroves for the Future and Gland, Switzerland: IUCN.



existing land through sediment deposition along mainland beaches.<sup>31</sup> Over the past couple of hundreds of years, net gain in land (ie after adjusting for land lost due to natural coastal erosion) has varied between 13 km<sup>2</sup> per year to up to 25 km<sup>2</sup> per year more recently, between 2000-2008.<sup>32</sup> While the net gain in land through natural accretion may appear relatively modest, it remains significant given the huge demand for land in Bangladesh. Thus, the Government of Bangladesh has invested greatly in afforestation of newly accreted lands in order to further trap sediments and speed up natural processes of accretion and land stabilization.



**Figure 1 Graphical representation of accretion stages and location of coastal communities inside and outside the embankment in Bangladesh**

19. The process of accretion is generally categorized into five phases based on level and duration of inundation. New land that is formed through natural accretion is fully inundated (high frequency of inundation or HFI; Type-I inundation) and only very few mangrove species such as *Sonneratia apetala* (Keora) and *Avicennia officinalis* (Baen) are suitable for plantation in these areas that are submerged continuously. As these pioneer species trap sediments and raise the soil, the level and period of inundation decreases. Depending on the duration of inundation,

<sup>31</sup> Ahmed 2012 *ibid*; Ir. F. Carvajal, M.Z.H. Khna, Md. M. Rahman 2011. Land Formation and Erosion in the Estuary. Chapter 2. In: K. de Wilde (ed). *Moving Coastlines: Emergence and Use of Land in the Ganges-Brahmaputra-Meghna Estuary*. The University Press Limited, Dhaka.

<sup>32</sup> Ahmed 2012 *ibid*; Carvajal et al. 2011 *ibid*

older *chars* are categorized into Type-II to V with the level of inundation ranging from 12, 9, 6 and 3 months of inundation in a year. Figure 1 depicts a typical char land with the white space showing new areas of accretion.

20. Legally, all newly accreted lands along the coasts and in the rivers, are classified as *khas* land, i.e. state-owned land belonging to the Ministry of Land (MoL) intended for redistribution to poor and landless households. In the case of coastal chars, these are leased to the Ministry of Environment & Forests (MoEF) for planting mangroves for a period of up to 20 years to stabilize the land.<sup>33</sup> Until recently, once the land has been stabilized, it had to be returned to MoL for redistribution to the landless and other marginal groups through the District administration. However, a government standing order issued in 2011 (partly as the result of the first LDCF-financed CBACC project's work) states that 50% of coastal mangrove plantations are to remain as permanent greenbelts to act as protective barriers against cyclones and sea surges. Furthermore, these permanent greenbelts are to be gazetted as reserved forests (i.e. under the jurisdiction of the BFD). A new draft act to ensure this standing order becomes permanently enshrined in national law, the Coastal Zone Declaration, Protection and Management Act, 2011 is currently being prepared through a process spearheaded by the CBACC project.

21. Between 1961-2010, 148,000 ha of coastal mangrove plantations were established by the Bangladesh Forest Department (BFD) of MoEF through various Government programmes and projects (see Table 1 below).<sup>34</sup> These were mainly established in the more exposed central coastal zone, scattered over various on- and offshore areas.<sup>35</sup> Around 80% of these plantations consist of Keora (*Sonneratia apetala*), about 15% of Baen (*Avicennia officinalis*), the rest consisting of Gewa (*Excoecaria agallocha*), Kankra (*Bruguiera gymnorhiza*), Goran (*Ceriops dacandra*), Sunadri (*Heritiera formes*) and Passur (*Xylocarpus mekongensis*).<sup>36</sup>

**Table 1 Major Coastal Afforestation Programmes undertaken by BFD since 1960-61**

	Programmes	Years
1	Afforestation in the coastal belt and offshore islands	1960–61 to 1964–65
2	Afforestation in the coastal belt and offshore islands	1965–66 to 1969–70
3	Afforestation Project in the coastal regions of Chittagong, Noakhali, Barisal and Patuakhali	1974–75 to 1979–80
4	Mangrove Afforestation Project	1980–81 to 1984–85
5	Second Forestry Project	1985–86 to 1991–92
6	Forest Resources Management Project	1992–93 to 2001–02

<sup>33</sup> The only exception is land that has reformed where there was previously private property within 30 years of ownership.

<sup>34</sup> I.U. Ahmad 2011. Forestry Development in Coastal Areas. Chapter 4 In: K. de Wilde (ed). *Moving Coastlines: Emergence and Use of Land in the Ganges-Brahmaputra-Meghna Estuary*. The University Press Limited, Dhaka.

<sup>35</sup> Ahmad 2012; Md. Mozaharul Islam, Deputy Conservator of Forests, Divisional Forest Officer, Sundarbans West Forest Division, Khulna, Bangladesh: Appendix 3 of Country papers/presentations; Coastal forest rehabilitation and management in Bangladesh

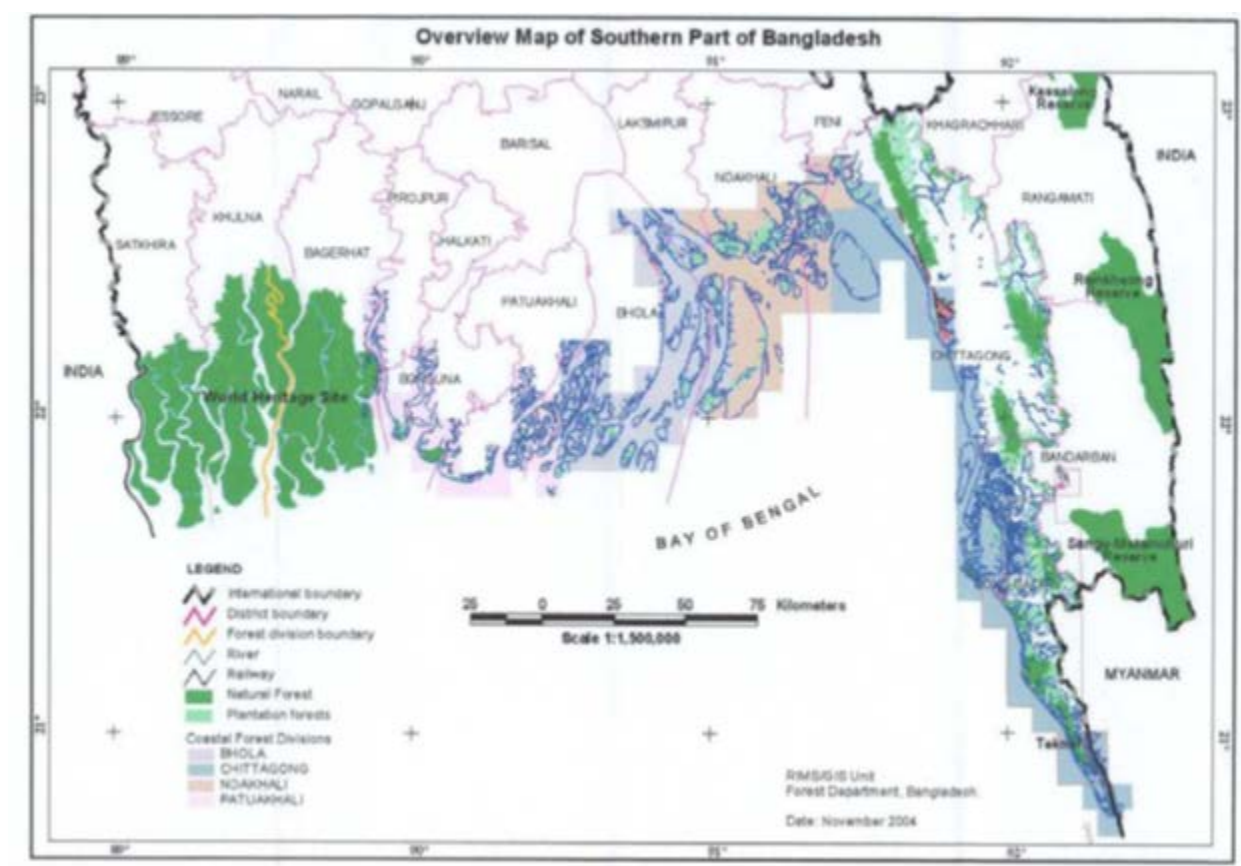
<sup>36</sup> Saenger, P & Siddiqi, NA 1993, 'Land from the sea: The mangrove afforestation program of Bangladesh', *Ocean and Coastal Management*, vol. 20, no. 1, pp. 23-39.

[http://epubs.scu.edu.au/cgi/viewcontent.cgi?article=1646&context=esm\\_pubs](http://epubs.scu.edu.au/cgi/viewcontent.cgi?article=1646&context=esm_pubs)

7	Extended Forest Resources Management Project	2002–03 to 2003–04
8	Coastal Green Belt Project	1995–96 to 2001–02
9	Coastal Char Land Afforestation Project	2005–05 to 2009–10
10	Management Support Project for Sundarbans Reserve Forest	2005–06 to 2009–10

Source: Islam M. 2006. The Country papers; Coastal forest rehabilitation and management in Bangladesh Coastal Forest Rehabilitation Workshop, Bangkok, Thailand.

**Figure 2 Coastal Forest Divisions and Areas of Natural and Plantation Forest in Southern Bangladesh**



Source: Forest Department, November 2004

22. To date, both the retention of afforested land as forest and its redistribution after the stabilization of newly accreted lands, have been beset with a number of problems of ecological and anthropogenic origin. The success of afforestation and reforestation efforts has been highly variable due to a range of institutional, technical and socio-economic factors that have affected



their long-term sustainability. An estimated 33% of plantations developed between 1961-2010 have failed due to erosion and encroachment. Furthermore, the quality of the plantations that were successfully established (c. 119,000 ha) is variable due to both ecological and anthropogenic factors. The former include cyclone wind damage as well as loss of trees due to pests (eg the Keora stem borer) and disease. Gaps in plantations do not always regenerate naturally, especially in more mature monoculture plantations, where conditions naturally become less favourable for the original pioneer species as land stabilizes and inundation patterns changes<sup>37</sup>. Plantations and natural mangroves have also proved vulnerable to a variety of anthropogenic threats from livestock grazing, mainly buffalo, to extraction of timber and outright conversion of plantations to other land uses such as agriculture, aquaculture and salt production. For example, some 600 ha of plantation have been lost to encroachment in Noakhali Coastal Afforestation Division in recent years.<sup>38</sup> Locally powerful elites often play a large role in the appropriation of newly accreted lands and degradation and loss of plantations. Both ecological and anthropogenic threats are discussed further in Section 1.4

23. As a result of these threats, there has been concern about how to maintain a sufficient area of intact coastal greenbelt for the continued protection of coastal populations against natural hazards, particularly in the context of a changing climate. Recent climate-related disasters have further accentuated the value of maintaining natural ecosystem buffers such as mangroves to strengthen coastal resilience to climatic and other natural hazards such as tsunamis.<sup>39,40,41,42</sup> The 2002 super cyclone, which hit Orissa State in India with a speed of 310 km/hr for eight hours, devastated coastal areas without mangroves.<sup>43</sup> Similarly, loss of life and damage to infrastructure arising from Cyclone Sidr and Ayla are reported to have been significantly lower in areas protected by coastal forests. Similar positive effects have been observed for lesser storms.

24. A number of limitations have been identified in historical approaches to coastal afforestation and reforestation in Bangladesh. First, while only a few pioneer species are suitable for planting on newly accreted coastal lands, there is need to transform these predominantly monoculture plantations subsequently into more ecologically resilient, mixed species plantations. Second, to date, the engagement of local communities in coastal afforestation and reforestation has been largely limited to providing labour for limited periods while the plantations are being established. Once the afforestation/reforestation work is completed, local communities have little

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<sup>37</sup> Increasing gaps and loss of trees due to pests are often unreported so accurate figures are hard to obtain. However, as reported later in the document, some estimates show that 50-80% of original forests can be lost.

<sup>38</sup> I. U. Ahmad 2012. Status of mangrove plantations in the living delta: an overview of the coastal afforestation experience of Bangladesh. In: Macintosh, D.J., Mahindapala, R., Markopoulos, M. (eds) (2012). *Sharing Lessons on Mangrove Restoration*. Bangkok, Thailand: Mangroves for the Future and Gland, Switzerland: IUCN; There are 4 Coastal Afforestation Divisions: Noakhali (34,223 ha), Bhola (12,420 ha), Patuakhali (9,848 ha), and Chittagong (20,042 ha).

<sup>39</sup> Kathiresan and Rajendran, 2005 K. Kathiresan and N. Rajendran, Coastal mangrove forests mitigated tsunami, *Estuarine, Coastal and Shelf Science* 65:601–606.

<sup>40</sup> Kerr, A.M., Baird, A.H., Campbell, S.J., 2006. Comments on “Coastal mangrove forests mitigated tsunami” by K. Kathiresan and N. Rajendran, *Estuarine, Coastal and Shelf Science* 2005; 65, 601-606. *Estuarine, Coastal and Shelf Science* 67, 539-541

<sup>41</sup> Vermaat, J.E., Thampanya, U., 2006. Mangroves mitigate tsunami damage: a further response. *Estuarine Coastal and Shelf Science* 69, 1-3.

<sup>42</sup> Mazda, Y., Magi, M., Kogo, M., Hong, P.N., 1997. Mangrove on coastal protection from waves in the Tong King Delta, Vietnam. *Mangroves and Salt Marshes* 1, 127-135.

<sup>43</sup> Kathiresan, K and Rajendran, N., 2003. Conservation and management of mangrove ecosystem in India, *Seshaiyana* 11(1): 1-4.

involvement in the maintenance or management of these plantations and little incentive to do so. Third, the BFD is only given a budget to protect new plantations for two years after planting and also has limited number of Forest Guards for patrolling and protection: each Forest Guard is responsible for protecting over 1,000 ha of new plantation. Last but not least, there are competing claims on newly accreted land and areas of new plantation from powerful vested interests. These factors are discussed further in Section 1.5.

25. The 2005 NAPA provides a compelling argument that risk reduction in coastal areas of Bangladesh can only be achieved if the maintenance of protective greenbelts is connected to tangible livelihood support and economic development options of communities living near such forests. Responding to this realization, the NAPA document of Bangladesh has identified the “*reduction of climate change hazards through coastal afforestation with community participation*” (p.24) as an adaptation priority, valued at 23 million USD. The Bangladesh Climate Change Strategy and Action Plan (BCCSAP 2009), which presents a comprehensive (but unbudgeted) 10-year action plan (2009-2018) for both adaptation and mitigation, also identifies the expansion and strengthening of coastal greenbelts as a priority action to develop a natural defence line against cyclones.<sup>44</sup> In addition, the Sixth Five Year Plan (FY 2011 – 2015) also underscores the need of afforestation and reforestation 250,000 ha of hill forest land, 40,000 ha of coastal areas and 7000 ha of plain land forest by 2015.

## **Root causes of climate change vulnerability in the coastal zone**

### Inherent Physical Vulnerability

26. Bangladesh is exceptionally vulnerable to the impacts of climate-related hazards by virtue of its geography, topography and climate. Around 80% of Bangladesh comprises low-lying floodplains located in the Ganges-Brahmaputra-Meghna delta, one of the world’s biggest deltas. Some 90% of the water from this basin flows into the Bay of Bengal through the lower Meghna Estuary, where the outflow is second only to that of the Amazon River.<sup>45</sup> The Bay of Bengal is particularly prone to cyclone formation and accounts for 10% of tropical cyclones recorded worldwide.<sup>46</sup>

27. The country’s 710 km coastline is also extremely dynamic, particularly along the Meghna Estuary in the central part of the coast, with continually changing coastlines due to natural processes of erosion and accretion.<sup>47</sup> Additionally, Bangladesh is extremely vulnerable to the impacts of upstream development and other actions as only some 7% of the total 1.72 million km<sup>2</sup> catchment area of the Ganges, Brahmaputra and Meghna Rivers falls within the country’s borders, the rest falling within the territories of India (62%), China (18%), Nepal (8%) and Bhutan (4%).<sup>48</sup> Thus, Bangladesh has very little control over actual water flows across its

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<sup>44</sup> BCCSAP estimates that the total costs of programmes in the action plan is \$500 million in the first 2 years of implementation and in the order of \$5 billion for 5 years.

<sup>45</sup> I. U. Ahmad 2012. Status of mangrove plantations in the living delta: an overview of the coastal afforestation experience of Bangladesh. In: Macintosh, D.J., Mahindapala, R., Markopoulos, M. (eds) (2012). *Sharing Lessons on Mangrove Restoration*. Bangkok, Thailand: Mangroves for the Future and Gland, Switzerland: IUCN.

<sup>46</sup> Ahmad 2012 *ibid*

<sup>47</sup> S. Ahmad & K. de Wilde 2011. Setting the Stage. Chapter 1 In: K. de Wilde (ed). *Moving Coastlines: Emergence and Use of Land in the Ganges-Brahmaputra-Meghna Estuary*. The University Press Limited, Dhaka.

<sup>48</sup> Ahmad 2012 *ibid*

territory. For example, dry season water shortages have been compounded by reduction in water flows due to upstream development.

### Threats arising from Demography, Poverty & Low Natural Resilience

28. Bangladesh has among the world's highest population densities, with approximately 1,015 people per km<sup>2</sup>, including very high coastal population densities. Coastal communities are more exposed to certain kinds of climate-related risks by virtue of living and working in close proximity to the sea. Of Bangladesh's 19 coastal districts, 11 districts and 48 Upazilas, with an estimated population of 35 million, are particularly exposed to natural hazards. The most active part of the delta is the central region, which covers the Districts of Bhola, Lakshmipur and Noakhali, as well as parts of Patuakhali and Feni Districts. This area has an estimated population of 7.6 million, of which 6.5 million are classified as rural inhabitants and 1.1 million as urban.<sup>49</sup> At current rates of growth, total population is projected to increase by another 60 million by 2040 and a significant proportion of that growth will be in the coastal zone (Section 1.1).

29. Acute rural poverty and widespread landlessness further compound vulnerability. For example, the proportion of landless and effectively landless (i.e. with less than 0.2 ha land) in the more exposed central coastal districts varies between 70-85% of the population, with some variation between Upazilas (Range: 35-85% landless and effectively landless).<sup>50</sup> There is an almost constant flow of migration within the coastal districts as people who have been displaced by coastal erosion or other natural hazards move towards newly accreted areas in the hope of finding jobs or acquiring new land. Many are willing to face all manner of hardship and risks to do so. Additionally, there is seasonal migration for work from other parts of the country to the coast during the peak agricultural seasons, April-May and October-November, which also coincides with the cyclone season.<sup>51</sup> Income level among populations in these areas is lower than the national average. For example, the average household income is BDT 3103 (approx. \$46) per month in Noler, Caring and Nangulia Char of Noakhali district while the national average is BDT 11,479<sup>52</sup>.

30. Earthen coastal embankments have been built along the Bangladesh coast since the 1960s to protect against tidal waves and storm surges. (More permanent coastal defenses are only constructed to protect very high-value assets and important infrastructure and installations as these hard engineering solutions are much more costly to implement.) The embankments are now maintained by the Bangladesh Water Development Board (BWDB) of the Ministry of Water Resources (MoWR) and may be as far as 1-5 km inland depending on their original location. Those living inside the coastal embankment are more protected from sea-induced flooding, coastal erosion and other wave damage than those living outside the embankment on the seaward side. However, in certain areas, those living on the landward side of the embankment have also been experiencing rain-induced flooding and water logging. While this has resulted in efforts to improve drainage along the landward side of the embankment, inland flooding remains a severe problem in some areas, one that serves to greatly reduce local resilience through damage and loss of livelihood assets including salination of land as well as increased health-related risks from stagnant water.

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<sup>49</sup> S. Ahmad & K. de Wilde 2011. Setting the Stage. Chapter 1 In: K. de Wilde (ed). *Moving Coastlines: Emergence and Use of Land in the Ganges-Brahmaputra-Meghna Estuary*. The University Press Limited, Dhaka.

<sup>50</sup> BBS 2010 (Data from MR)

<sup>51</sup> Khan n.d.

<sup>52</sup> CDSP-IV project document

31. The exact number of people living outside the embankment is not known, but an estimated 3 million live on char lands, where population densities can be as high as 1,000/km<sup>2</sup>. People also occupy a large number of the country's 70-odd marine and estuarine islands on a seasonal basis.<sup>53</sup> In Hatiya Upazila, for example (one of this project's target Upazilas), nearly 200,000 people, or 44% of the Upazila's total population of over 452,000, live outside the embankment. At the Union-level, the proportion of the population living outside the embankment ranges between 20-100% across Hatiya's 12 Unions, including 3 unions where 100% of the population lives outside the embankment.<sup>54</sup> In Naltona Union of Barguna Sadar Upazila, one of the project sites of the 1<sup>st</sup> LDCF project, some 2,350 people or 13% of the population of 18,180 (Population Census, 2001) are estimated to be residing outside the embankment.<sup>55</sup> Figure 3 below depicts the extent of coastal embankment and settlements (in brown shade) outside the embankment in Naltona. Mangrove plantations typically take place in the areas outside the embankment (notice the extent of land outside the embankment). Non-mangrove plantations take place both inside and outside the embankment depending on the level of land stability (outside embankment) and the type of tree species.

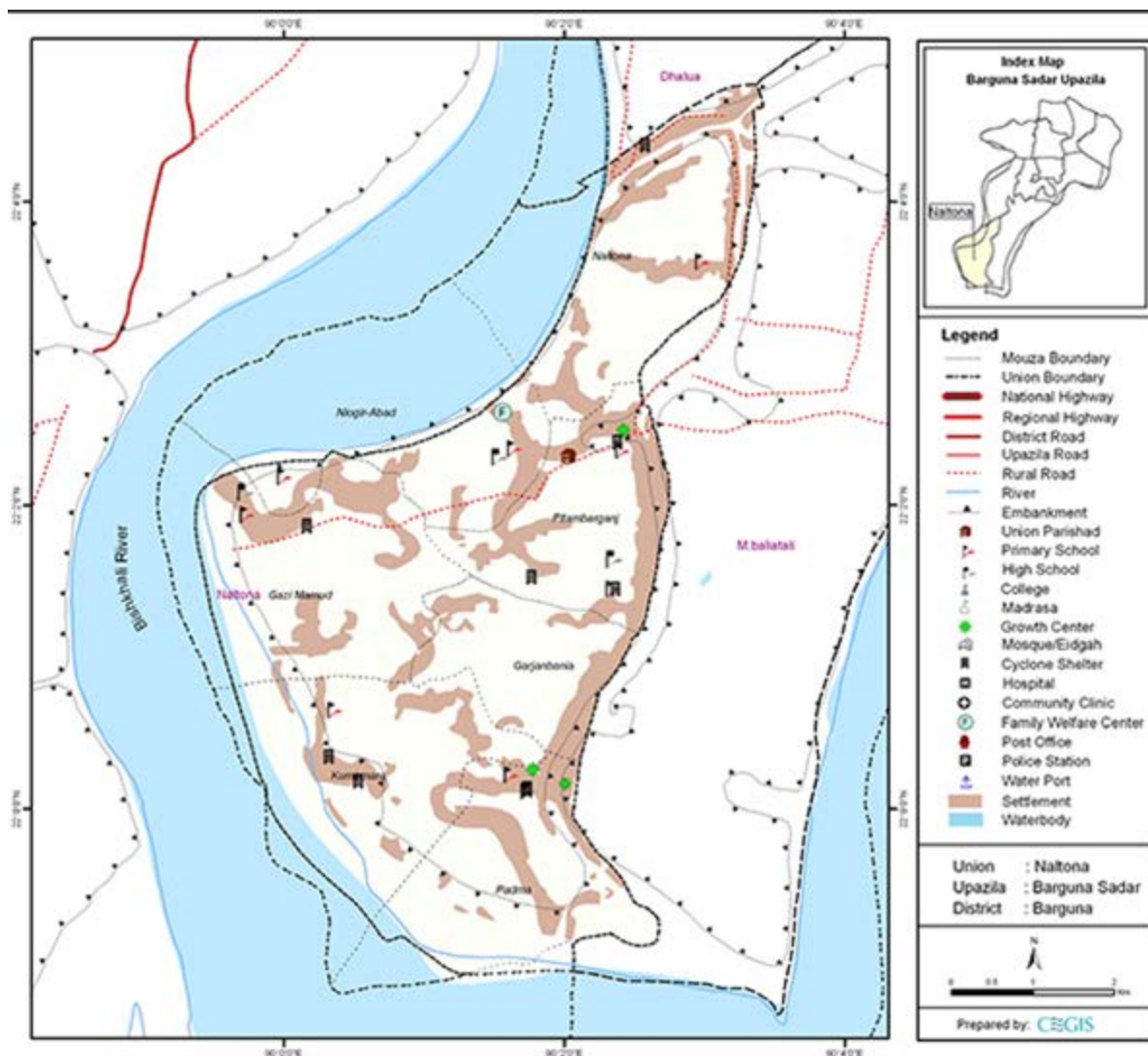
**Figure 3 Estimated population living outside Naltona Union in Barguna Sadar Upazila**

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<sup>53</sup> Ahmed & Wilde 2011. *Ibid.*

<sup>54</sup> Statistics Office, Upazila Parishad Hatiya, from 2011 Government Census Data

<sup>55</sup> Dr Nandy, pers. comm. 2013



32. Maintenance of earthen embankments is beset with problems, particularly in the coastal zone where these are also exposed to erosion by wave action and changing water levels. In many areas, embankments along the foreshore disappear within a year or two as a result of erosion. There are attempts to strengthen earthen embankments locally for example by reinforcing these with cement concrete blocks, stone or wood retaining walls, sandbags (geobags) and of course coastal plantations to limited effect. One option that is proving successful in stabilizing earthen embankments in other countries is the use of long-rooted vegetation such as vetiver grass, but this has yet to be attempted in Bangladesh, although coastal climatic and soil conditions are favourable to growing vetiver grass.

33. Historically, the need for coastal embankments would have been much lower as coastal populations would also have been buffered to varying extents by natural mangroves, other wetland vegetation and other natural features. However, Bangladesh's natural coastal ecosystems have undergone drastic changes over several decades as a result of population increase, land use change and other economic developments. For example, average population



density in 1947 was only 306/km<sup>2</sup> and by 1971, it was still around 501/km<sup>2</sup>.<sup>56</sup> Not surprisingly, Bangladesh has lost more than 90% of its natural forests over the last 100 years<sup>57</sup> and the largest remaining single block of coastal forests is in the Sunderbans. More exposed coastal areas, have only patches of mainly planted mangroves, which cover a total area of some 132,000 ha (see Figure 2, Section 1.3).<sup>58</sup> Additionally, the LDCF-financed CBACC project has also completed over 6,000 ha of coastal afforestation, bringing the total coastal forest cover up to c. 138,000 ha by 2013.

#### Threats arising from changing patterns of landuse, economic production and consumption

34. The coastal zone of Bangladesh plays an important part in the country's national development. While GoB recognizes the importance of sustainable environmental management in this sensitive zone, there are many competing demands on land and other coastal and marine resources from multiple sectors as well as from individuals for both subsistence and economic production reasons. Coastal areas are used intensively for agriculture, settlements, shrimp farming and fisheries, salt production, industrial and infra-structural developments and tourism. Around 41% of the total coastal zone is cultivable, with rice production dominating production and contributing around 16% to total annual rice production in Bangladesh. Capture fisheries and more recently aquaculture are also important contributors to national GDP and export earnings and the latter now cover around 116,000 ha of the coastal zone representing 40% of all aquaculture ponds in Bangladesh.

35. The coastal zone is also home to 2 seaports and 3 Export Processing Zones that have a number of valuable resources including 3 gas fields, mineral stocks and several gas blocks in the Exclusive Economic Zone (EEZ). Expansion of economic activities across the coastal zone has resulted in large-scale clearing of forests, both natural and planted, as well as alteration of other ecological features that would have previously reduced people's vulnerability to climate-related risks. For example, almost all of the mangrove forest in the vicinity of Chittagong and Cox's Bazar has already been cleared for other land uses.

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<sup>56</sup> Hossain *et al.* n.d.

<sup>57</sup> MoEF/GoB 2012. *Rio +20: National Report on Sustainable Development*.

<sup>58</sup> <http://www.bforest.gov.bd/index.php/forest-category/mangrove-forests>

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36. Much of this coastal development, including industrial development, has been ad hoc and rarely takes into account environmental considerations and adaptation needs. Thus, unplanned coastal development and land use change have also been major drivers of the increasing vulnerability of coastal populations over recent decades as these have contributed to coastal and marine environmental degradation through natural habitat loss, pollution and other negative impacts, thereby also reducing overall ecosystem resilience. Given the large numbers of poor people who rely directly on coastal and marine resources for their livelihoods and their immediate wellbeing, environmental degradation further increases people's vulnerability to climate change impacts. Pressures on the coastal zone's natural resource base are continuing to intensify as populations grow, and rates of production, consumption and waste production continue to rise. Bangladesh is also vulnerable to land use changes outside its borders, particularly the impacts of upstream developments and land modification in neighbouring countries as Bangladesh itself forms only a small part (c. 10%) of the region's hydrological system.

### **Long-term solution and barriers to achieving the solution**

37. Climate-related risks to coastal communities in Bangladesh are already serious and likely to be exacerbated by the effects of climate change, which is projected to increase the frequency of cyclones, storm surges and tidal waves as well as to cause SLR (Annex 1). To reduce the vulnerability of highly exposed coastal communities to such effects of climate change, the government's efforts to build coastal greenbelts, which provide potentially cost-effective physical protection against high winds and storm surges, need to continue and expand so that greater areas of exposed coastal settlements are shielded from the sea by such natural greenbelts. Simultaneously, the current incentive structure created around establishing and maintaining the greenbelts, as perceived by coastal community members, needs to alter gradually, from one that predominantly focuses on the monetary incentive of daily, one-off labour at the time of plantation to one that places more emphasis on the longer-term multiple benefits of such forests.

38. Given the competing demands and anthropogenic pressures on coastal lands and forest resources, long-term sustainability of coastal greenbelts can be achieved only by shifting the way community members perceive the stream of benefits from maintaining these over alternative uses and they have security of tenure over these benefits through explicit acknowledgement of this in a formal government policy. In promoting longer-term engagement of coastal communities as stewards of coastal greenbelts, it is essential that both government officials and community members gain greater insights into different types of benefits from different stages of mangrove forest growth process. At the same time, efforts must be expanded to transform existing monoculture-driven mangrove forests, which generally produce limited volume and types of benefits, to more diverse ones producing multiple benefits.

39. It is also critical for the Government and communities to acknowledge that it is inevitable that residual climate risks – risks that still persist after feasible adaptation measures are in place – remain in coastal areas of Bangladesh especially from tropical cyclones, and that they are sufficiently prepared for such risks. Growing literature and empirical evidence suggest that efficient and effective dissemination of imminent risks is one of the prerequisites for disaster



preparedness<sup>59</sup>, which is currently still limited in Bangladesh, and disproportionately so in coastal areas. Effective disaster preparedness also involves tailored interventions to reduce risks imposed on livelihood assets and systems in particular localities under question.

40. In summary, in order to enhance climate resilience of coastal communities, there is need to greatly expand coastal mangrove forest cover as a natural buffer against extreme climate events while leveraging local communities as stewards of these forests. At the same time, residual climate risks need to be mitigated to the extent possible through enhanced preparedness to natural disasters. There are a number of barriers, however, that prevent GoB from attaining this long-term solution. These barriers are described below:

#### *1.5.1 Limited level of livelihood diversification in coastal areas that drives communities to encroach and exploit coastal greenbelts*

41. One of the most critical barriers that impede the establishment of sustainable coastal greenbelts is the limited level of livelihood diversification in coastal areas. Most residents in coastal Bangladesh are extremely poor and dependent on natural resources for their livelihoods, most commonly agriculture and fishing. As climate change impacts become increasingly visible and sustaining such livelihoods becomes more and more difficult, these communities perceive coastal mangrove forests more as an immediate source of income substitute through exploitation rather than as something that potentially offers a protective buffer against natural calamities or a sustainable stream of income through new forms of management. This is not surprising since past afforestation efforts along the coasts rarely took into account the long-term livelihood needs of these communities. This has created a suboptimal equilibrium where the very people whose lives and livelihoods are to be protected by the greenbelts become a major threat to the integrity of these forests and thus their potential to strengthen local adaptive capacity.

42. To break this equilibrium, it is critical that more climate-resilient, diversified livelihood options are made available to these communities in a way that explicitly recognizes the need for maintaining the greenbelts to sustain such livelihood options. The CBACC project, for example, has demonstrated there are untapped opportunities for diversifying and/or increasing income-generating opportunities in areas that were previously considered unproductive, barren land through the introduction of various approaches including: the Fish-Fruit-Forest (FFF or Triple-F) model, in which the elevated dyke structure enabled production of fruit trees and the ditch enabled fish and duck rearing; mound plantations, which similarly enabled to grow fruit trees by raising the soils away from saline groundwater; the use of salt-tolerant rice varieties; and facilitating a shift from goat rearing to more climate-resilient duck and pigeon farming<sup>60</sup>.

43. As visually presented in Figure 5 in Section 2/Outcome 1, such a successful demonstration of alternative livelihood options in adjacent areas of coastal mangrove plantations is extremely rare. Furthermore, a limited level of demonstration and experience inevitably leads to limited dissemination of hands-on, technical know-how among community members and local

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<sup>59</sup> See for example, United Nations. (2008). *Disaster preparedness for effective response – Guidance and indicator package for implementing priority five of the Hyogo Framework*. United Nations.

<sup>60</sup> It is equally critical for coastal communities to understand that these resilient livelihood options work more effectively in places where mangrove forests exist. The need to create such awareness is described later and addressed through several outputs, particularly Outputs 1.1, 2.3 and 3.1. However, as this is a cross-cutting issue additional outputs are likely to also include relevant elements of awareness generation on role of coastal forests in protecting local livelihoods.

government agencies making it difficult to replicate such a success more widely. This particular barrier to increasing climate resilience of communities through greater diversification of livelihoods in mangrove plantation sites will be overcome primarily through Output 1.1, which will support a range of strategies to increase the resilience of local livelihoods around new coastal afforestation and reforestation sites that are less than five years old. It is extremely important to demonstrate the future protective value of young mangrove forests by explicitly linking the maintenance of such plantations with livelihood opportunities as young mangrove forests typically have limited direct use value as a potential source of fuel, fodder and other NTFP. Thus it is hard for communities to recognize the full potential value of these forests.

### 1.5.2 Lack of coastal greenbelt species diversification

44. As newly accreted lands become more stabilized and ecological conditions change (soil type, frequency and duration of inundation, etc), these become increasingly unsuitable for the initial pioneer species such as Keora. Such conditions typically start to occur after 4-5 years of initial plantation. Mature Keora trees, which make up the majority of coastal plantations, are particularly susceptible to pests such as stem borer, which usually come from neighbouring agricultural land. This creates large gaps in monoculture plantations where pest infestations can spread quickly. These gaps can no longer be filled through new Keora saplings (i.e. through natural regeneration of Keora), as the ecological conditions that were originally suitable for Keora have changed. However, in the absence of a nearby source of alternative mangrove species suited to these changed ecological conditions, the gaps persist, become larger and/or are invaded by weed species. Losses of between 50-80% of planted trees due to pest infestations resulting in big gaps in greenbelt structures have been reported.<sup>61</sup> Susceptibility to pests and diseases will be further aggravated by climate change. Thus, after a few years, mangrove plantations that were established with a handful of pioneer species require increasing levels of management to promote 'artificial succession' if they are to avoid such losses of trees.

45. The Bangladesh Forest Research Institute (BFRI) has been experimenting with trial 'model' plantations for some years to explore the methods and benefits of establishing multispecies mangrove plantations. These are only possible on lands that are sufficiently stabilized and have a lower frequency and duration of inundation. Based on its research, BFRI recommend the following nine mangrove species in addition to Keora and Baen for mixed species plantation on stabilized chars: Sundari (*Heritiera fomes*), Gewa (*Excoecaria agallocha*), Passur (*Xylocarpus mekongensis*), Shingra (*Cynometra ramiflora*), Khalshi (*Aegiceras corniculatum*), Kankra (*Bruguiera gymnorhiza*), Hanthal (*Phoenix paludosa*), Goran (*Ceriops dacandira*) and Golpata (*Nypa fruticans*). Diversification with indigenous species offers a number of benefits including strengthening the natural resilience of the plantations to changes in environmental conditions such as climate change impacts as well as the potential for a selecting species of greater value to local communities. However, diversification of monoculture/low species diversity plantations through afforestation with multiple indigenous species is also a more complex and costly undertaking in terms of nursery raising of seedlings, transport, transplantation and immediate aftercare, partly because some species cannot be raised in nurseries, but must be harvested from the wild, notably in the Sunderbans, further adding to costs. To date, because of the costs and complexities of coastal forest diversification, there has been limited uptake by the BFD. Additionally, given that until recently, newly accreted lands given to BFD for afforestation were to be returned to MoL after 20 years, there has been little incentive for BFD to invest long-term

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<sup>61</sup> See for example, Nandy, P., Alam, M.J., and Haider, M.R., 2004. Establishment of mangrove seed production area for *Sonneratia apetala*. *Journal of Tropical Forest Science*. 16(3): 363-368. Also Farid, ED of AF, during Inception Workshop

in coastal forests. This, however, has recently changed as a result of the work of the LDCF-supported CBACC project (see below).

46. Output 1.2 seeks to build on the policy and technical achievements of CBACC and BFRI to overcome this particular barrier by further testing new strategies for mixed species diversification of coastal plantations at different stages of growth, both to increase the natural resilience of the coastal belt as well as to increase its potential to generate tangible benefits for local communities.

### *1.5.3 Limited local participation in coastal greenbelt management and insufficient incentives for communities to ensure their long-term maintenance*

47. Coastal greenbelts have the potential to generate many benefits for local communities through increased protection from climate hazards as well as income through employment and a greater stream of benefits from natural resources. To date, however, the involvement of local communities in the establishment and management of coastal greenbelts has been largely limited to daily wage employment at the time of plantation establishment, which includes both nursery raising of seedlings and plantation establishment. This approach of community engagement inevitably creates a perception among vulnerable communities that the biggest benefits are derived at the time of plantation – through daily wage employment – with diminishing benefits from maintaining the greenbelts. There are several underlying causes for this barrier ranging from policy to socio-economic, and perception factors.

48. Bangladesh has been slowly moving towards greater participation of local communities in forestry since the introduction of the National Forestry Policy of 1994, which has sustainable development and poverty alleviation through people's participation in forest protection and management amongst its objectives. Subsequently, the Forest (Amendment) Act 2000 and new Social Forestry Rules in 2004, amended in 2009 and 2011 (also see Section 2.1), have been instrumental in establishing rules about forestry-related benefit-sharing with local communities in general. So far, approximately BDT 1760.53 million (around US\$25 million) has been shared among 102,480 participants as part of their benefit share<sup>62</sup>. However, these rules apply only to non-mangrove forests and have thus not benefited coastal communities other than through the daily wages earned at the time of planting coastal greenbelts as described above.<sup>63</sup> A key reason for the non-application of benefit-sharing rules to mangroves is Government concern that it may not be able to enforce such rules and that existing primarily monoculture plantation or low-species diversity mangrove plantations do not generate a sufficient stream of tangible benefits, which directly relates to the barrier presented above.

49. At the same time, there are enormous incentives for local communities to encroach newly accreted lands given high population density, on-going population growth, the paucity of land in Bangladesh and lack of clarity about the tenure of newly accreted char lands. Migration to char lands often begins with relatively wealthier individuals sending herds of buffalo across to new chars along with a few cattle herders. While the BFD has some budget for protection of coastal plantation for the first two years, it simply does not have the resources or the manpower to protect plantations beyond that period or often even during that period, particularly against

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<sup>62</sup> Bangladesh Forest Department 2013. <http://www.bforest.gov.bd/index.php/forest-management/social-forestry>

<sup>63</sup> A number of authors have also commented on the challenges of applying the Social Forestry Rules to achieve their intended purpose in non-coastal forests.

locally powerful elites.<sup>64</sup> Plantations are especially vulnerable to disturbance in the first 3-4 years after their establishment, until their canopy closes.

50. This presents a compelling case for the need to create an alternative competing incentive structure that promotes the long-term sustainability of coastal plantations. However, while Bangladesh has been moving towards increasingly participatory forest management, the BFD still has relatively little experience of empowering local communities to participate as equal partners in forest development and management.<sup>65</sup> As in many other countries, this requires a major shift in institutional culture and operational practices that for centuries have been based primarily around a 'command and control' approach and developing the necessary skills to engage communities on an equal footing and build trust. Local communities too, will have to overcome their own capacity limitations if they are to be able to take responsibility for coastal forest management, including amongst other things, the ability to better survey, monitor and protect forests, engage with different types of stakeholders, and implement mechanisms that ensure equitable benefit-sharing.

51. The various policy, institutional and capacity barriers that currently combine to prevent the long-term maintenance of newly afforested lands will be addressed by the project through several outputs under Outcomes 1 and 2. Output 1.2 will support mixed species diversification trials in selected older mangrove plantations to demonstrate how potential benefit streams from coastal plantations could be further enhanced. All the outputs under Outcome 2 are targeted at removing the obstacles outlined above that currently prevent greater community support for the long-term maintenance of coastal greenbelts. Under Output 2.1, the project will build on and expand the concept of Co-Management Committees (CMCs) and village-level Forest Resource Management Groups (FRMGs), which have already been used with some success in Bangladesh, as a key mechanism for supporting greater community participation in coastal greenbelt planning and decision-making. Output 2.2 focuses on achieving government agreement on forest-benefit sharing in coastal forests through a policy statement on forest-benefit sharing. Finally, Output 2.3 addresses the capacity gaps of local communities, BFD and other key government stakeholders to effectively support coastal greenbelt co-management and benefit-sharing with local communities.

#### *1.5.4 Weak inter-sectoral coordination on coastal greenbelts*

52. Given Bangladesh's exceptional vulnerability to climatic hazards, the development and maintenance of a coastal greenbelt is a well-recognized national policy priority in Bangladesh. Thus, all government ministries and departments at national and subnational levels are expected to pay due attention to this special issue. However, there remains little effective coordination between key sector stakeholders to ensure the long-term sustainability and effectiveness of coastal greenbelts. As is true in many countries, individual sector plans are prepared, funded and implemented largely in isolation from each other, thereby missing many opportunities to maximize synergies and complementarities or minimize duplications or contradictory actions. Afforestation of newly accreted lands is the responsibility of the BFD,

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<sup>64</sup> I.U. Ahmad 2012. Status of mangrove plantations in the living delta: an overview of the coastal afforestation experience of Bangladesh. In: Macintosh, D.J., Mahindapala, R., Markopoulos, M. (eds) (2012). *Sharing Lessons on Mangrove Restoration*. Bangkok, Thailand: Mangroves for the Future and Gland, Switzerland: IUCN; D.K. Choudry & M.A. Latif 2011. Land Settlement: The Process of Providing Land Titles. Chapter 8 In: K. de Wilde (ed). *Moving Coastlines: Emergence and Use of Land in the Ganges-Brahmaputra-Meghna Estuary*. The University Press Limited, Dhaka; World Bank 2013. *CRPARP Project Appraisal Document*.

<sup>65</sup> World Bank 2013 *ibid*

which considers their primary goal to be the creation of an effective coastal greenbelt. The priority of the Ministry of Land, however, is to increase the area of land that is stabilized through afforestation for subsequent redistribution for other purposes, particularly to the very poor and the landless. The Water Resources Planning Organization (WARPO) of the Ministry of Water Resources (MoWR) has amongst other things responsibility for coastal zone management planning. The Bangladesh Water Development Board (BWDB) is responsible for coastal protection infrastructure, including over 5,000 km of earthen coastal embankments. The Department of Disaster Management (DDM) of the Ministry of Disaster Management and Relief (MoDMR) undertakes a range of activities to reduce disaster risk and prepare for an emergency response. Although newly accreted lands are used by multiple agents for multiple purposes, currently there is little coordination of these activities and sharing of good practices for, e.g. strengthening resilience to disasters. This is a lost opportunity to greatly enhance the integrity, effectiveness and sustainability of coastal greenbelts.

53. For example, the land either side of a coastal embankment up to 1 km distance of the embankment is under the control of the BWDB although encroachment by people is a major problem (Section 1.4). There is tremendous potential for utilising this land to further strengthen the adaptive value of coastal greenbelts by, for example, strengthening the embankment on the seaward side through planting appropriate species and by utilising land on the inside of the embankment to further diversify local livelihoods, potentially through schemes linked to protecting afforestation and reforestation outside the embankment. These measures would serve to reduce the vulnerability of coastal populations in several ways: first, the coastal greenbelts are in effect the first line of defence against cyclones, storm surges and SLR, while the coastal embankments serve as a potential second line of defence; second, utilising land on the seaward side of the embankment for afforestation or planting with soil-binding species and on the landward side for livelihoods diversification would prevent people encroaching this land; third, putting land to such alternative uses either side of the embankment will serve to strengthen the sustainability and effectiveness of the embankment itself. There are nearly 1,000 km of embankment along the sea-facing polders of Bangladesh, but only some c. 60 km are currently protected to varying extents by mangroves. Given that the BWDB does not have the mandate to actually maintain the embankments through regular repairs, but only to reconstruct them when completely damaged, such measures have the potential to greatly reduce people's vulnerability to flooding as a result of reduced damage to embankments from wave-induced erosion and encroachment. To date, there have been limited efforts by BWDB and BFD to integrate coastal embankment and coastal greenbelt planning and management. WARPO too is not directly involved in supporting coastal greenbelt sustainability despite their mandate for coastal zone management planning. However, the World-Bank funded Strategic Programme for Climate Resilience (SPCR), will be supporting some afforestation along the coastal embankment as part of a project on coastal embankment improvement.

54. Not all char land is suitable for establishing mangrove plantations and there are also limits to the protective functions of mangrove plantations, particularly in the early years. Thus, alternative and additional coastal protection strategies are needed to complement coastal greenbelts such as early warning systems and better local disaster preparedness planning and preparation. The latter in turn require support from the Disaster Management Departments and departments responsible for supporting different types of local livelihoods such as the Department of Agricultural Extension, the Department of Fisheries and the Directorate of Livestock. However, again, there is little formal coordination between these departments to integrate coastal greenbelts into their plans and priorities for example, by providing complementary support mechanisms that reduce risks from extreme climatic events such as



flood-proofing of communal infrastructure or providing targeted extension services to increase local capacity to select locally appropriate, climate resilient livelihood options.

55. The project will address the problem of weak intersectoral coordination on coastal greenbelts primarily through the establishment of multisectoral Co-Management Committees in selected upazilas under Output 2.1 and targeted capacity development of key actors within Co-Management Committees under Output 2.3. Additionally the project will be working closely with different government sectors to deliver other Outputs, including notably the Department of Disaster Management under Outputs 3.1 and 3.2. This too will serve to strengthen awareness across key sectors about the adaptive potential of coastal greenbelts and the need - and options - for greater intersectoral coordination to promote local climate resilience.

#### *1.5.5 Limited capacity for early warning dissemination on the ground in coastal areas to protect lives and livelihood assets*

56. While the establishment and long-term maintenance of coastal greenbelts is a cost-effective way of reducing the vulnerability of millions of coastal community members to future climate impacts, it is important to recognize that there will be residual damages from climate-induced natural disasters that will continue to threaten the lives and livelihoods of coastal people. Nonetheless, to date, existing programmes on disaster management in Bangladesh were largely focused on disaster response and relief planning rather than on disaster prevention and early warning services in the context of climate change risks. The GoB's long-standing support to Cyclone Preparedness Programme and the multidonor-funded Comprehensive Disaster Management Programme (CDMP), implemented by UNDP and now in its second phase, are almost the only large-scale initiatives that place more emphasis on disaster risk management and reduction. Most notably, the CPP has, over many decades, established a network of volunteers who play an important role in disseminating early warning information and search and rescue; and the CDMP has helped to develop the country's early warning capacity. As a result of CDMP support, the Flood Forecasting and Warning Centre (FFWC) now has the technical ability to increase lead time from three to five days although further improvements in the accuracy of forecasting are needed. Similarly, with CDMP-II support, the Bangladesh Meteorological Department (BMD) has acquired enhanced computing capability and high-speed internet facility. This, combined with improvements in BMD's Storm Surge Unit's technical capacity, has resulted in faster download and analysis of satellite data in shorter period of time (down from 2 hours to 10 minutes). The result of these improvements is faster dissemination of imminent meteorological risks with improved accuracy.

57. Despite the progress on early warning capacity made in the CDMP, however, this information does not always reach communities living in more remote areas such as in and around the newly accreted coastal lands. CDMP-II is currently assisting and expanding a network of volunteers, which was established in the GoB's Cyclone Preparedness Programme. However, CDMP does not have the capacity to cover all parts of the country.

58. Lack of such early warning information particularly in coastal areas greatly increases people's vulnerability to climate risks as it reduces their ability to take appropriate action in relation to their own safety and their livelihood assets by knowing whether they need to relocate to an emergency shelter and what moveable assets to take with them. Existing capacity gaps in early warning will be addressed in and around seven target Upazilas in which coastal mangrove afforestation is taking place through Output 3.1, which focuses on increasing both short-term and longer-term capacity. At the same time, Output 3.2 will focus on providing concrete

protective measures for key livelihood assets against residual climate risks that the coastal greenbelt and existing embankment alone are not capable of mitigating.

59. The foregoing discussions (Sections 1.5.1 to 1.5.5) present various inter-related threats to the sustainability of coastal greenbelts and the barriers that prevent the GoB from addressing or removing such threats at present. The challenge for the GoB is compounded by the fact that the underlying drivers of these threats change as mangrove forests mature over time and thus the appropriate actions to counter these threats must also evolve accordingly. This project has been designed to specifically assist the GoB to overcome these barriers as well. The following table summarizes how some of the underlying drivers of threats alter over time and how the proposed LDCF project envisages addressing them:

**Table 2 Evolution of underlying drivers of threat to coastal forests and proposed project interventions to overcome existing barriers**

Year	Status of mangroves	Potential benefits from mangrove forests	Threat to the forests	Barriers <sup>1</sup>	Project intervention
1-5	Pioneer species of Keora and Baen planted to stabilize land. Stabilization starts to occur but land still unsuitable for livelihood activities.	Pioneer species offer very limited benefits especially in early stages of growth; Livelihood options limited under the business-as-usual conditions	Speculative land grabbing (often organized by local elites) by people in search of future jobs and land-based economic production. Grazing by cattle.	Poverty and lack of alternative livelihood drives people to settle newly accreted lands.	Alternative livelihood options presented in areas adjacent to forests and explicitly linked to roles and responsibilities for forest stewardship through community management groups
5-15	Land is almost stabilized; gaps start to emerge as Keora susceptible to pests, but no natural regeneration as ecological conditions have changed and no longer suited to pioneer species.	Thinning of older Keora trees can be used for fuel. if enrichment planting is done, other mangrove species start to offer more benefits	Clearing of Keora and Baen for agricultural activities or in search for fuel wood	Poverty and lack of benefit-sharing agreement drives further land clearing and encroachment..	Establish a benefit-sharing agreement between government and local communities for selective exploitation of coastal greenbelt natural resources
20-	Forest is mature, but gaps continue to grow if no diversification /enrichment planting has taken place.	Monoculture plantations continue to yield few benefits to local communities. Diversified plantations however can now generate multiple economic benefits ranging from thatch and other NTFP	Ecological degradation and loss of natural resilience of coastal forests compounded by continuing anthropogenic degradation and loss	Poverty and lack of benefit-sharing options drives further land clearing and encroachment.	Demonstrate potential stream of benefits that can be generated through forest diversification through mixed species trials and assessments of existing multispecies plantations.

**Notes:** 1) A constant underlying barrier is that BFD lacks capacity to adequately protect or enforce existing laws regarding coastal forest protection beyond the first two years of plantation establishment. It is generally accepted that seeking to merely develop capacity for improved enforcement through additional staff and equipment is unsustainable; the project approach focuses on removing this barrier by creating the right incentives to promote greater voluntary compliance with rules designed to maintain coastal forest adaptive capacity in the long-term.



## Stakeholder baseline analysis

60. Key stakeholders with a major direct role in this project were identified and consulted at different stages during the Project Preparation Grant (PPG) phase in order to obtain their inputs and feedback on project design. The project has been designed to scale-up the achievements of the Community-Based Adaptation to Climate Change through Coastal Afforestation (CBACC) project, Bangladesh's first LDCF-financed project, and to meet the additional costs of strengthening the resilience of new coastal greenbelts that will be established under the recently-approved Climate Resilient Participatory Afforestation and Reforestation (CRPAR) Project funded through the Bangladesh Climate Change Resilience Fund (BCCRF). Thus, many of this project's key stakeholders, particularly at the national level, are the same as for the CBACC-financed project. The project will also build on the new institutional relationships developed by CBACC at both national and local levels.

61. The Ministry of Environment and Forest (MoEF) will take the lead in coordinating with other stakeholders and overseeing the implementation of the project. The MoEF will, amongst other things, host the Project Management team and be responsible for collaborating at the national level with other government ministries and departments, non-governmental organisations (NGOs) and research institutions through the Inter-ministerial Committee on Climate Change. The MoEF will bring the Bangladesh Forest Department (FD) as the Responsible Party for Outcome 1 as the FD is also the focal agency for the CRPAR project. Other important government stakeholders include the Ministry of Land (MoL), Ministry of Fisheries and Livestock (MoFL), the Department of Disaster Management of the Ministry of Disaster Management & Relief (MoDMR) and the Ministry of Water Resources (MoWR).

62. Major stakeholders outside the capital Dhaka, include members of local government, at District, Upazila, Union and Ward levels, both civil servants and elected officials, as well as local communities in the project target areas. The latter were selected through consultations with the CBACC project team, Bangladesh Forest Department, the World Bank and Arannayk Foundation (Bangladesh Tropical Forest Conservation Foundation, created in 2003 through a joint initiative of GoB and US Government under the provisions of US Tropical Forest Act 1998), which will be implementing the Alternative Livelihoods component of the BCCRF-funded CRPAR project (Section 2.3.2).

63. Ensuring complementarity and additionality with the CRPAR project and other major baseline projects, avoiding duplication with CBACC, targeting the most vulnerable communities and areas and maximizing project impacts were among the key criteria guiding the selection of project target areas. Thus, this LDCF-supported project will work in at least seven upazilas in four coastal districts covered by the CRPAR project, namely in Barguna, Bhola, Noakhali and Patuakhali Districts<sup>66</sup>. CBACC is already working in Barguna, Bhola, Patuakhali and Noakhali

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<sup>66</sup> When the project concept was initially formulated, it was envisaged that the LDCF project would work in all 19 coastal districts of Bangladesh (as stated in the approved PIF of December 2011). This was based on the BCCRF-financed CRPAR project's preliminary work plan at the time. Since then CRPAR project has reduced the number of districts targeted to nine and will only undertake coastal mangrove afforestation in four of these excluding the hill districts of Chittagong and Cox's Bazaar. As project interventions are closely aligned with baseline investments by the CRPAR project, it was decided during the project preparation phase to focus on the same four non-hilly coastal districts (which are among the most vulnerable coastal districts in Bangladesh) and those Upazilas where there would be no overlap with the Arannayk Foundation, which is implementing the Alternative Livelihoods component of the CRPAR Project. While the geographic focus of the project has reduced, the total number of target households remains the same and thus the overall scale of intended impact with LDCF support remains the same.

districts, but this project will work mainly in different Upazilas from the CBACC project other than Hatiya Upazila (see Table 3 and Annex 5 for further details).

64. At the subnational level, the District Environment and Forest Development Committee (DEFDC), the District Disaster Management Committee (DDMC) and Upazila Development Coordination Committee (UDCC) along with the Upazila-level staff of key line agencies such as Bangladesh Forest Department, Directorate of Agriculture and the Department of Disaster Management are particularly key stakeholders, who will be involved in the implementation of different activities at local level in line with their respective mandated roles and responsibilities as described further in the Stakeholder Involvement Plan (Annex 3). They will also be responsible for implementing any policy changes at the Union, Upazila and District level. At the Union Level, the Union Parishad will be the key local government counterpart for project interventions, along with the Union Disaster Management Committees (UDMCs), the Sub-Assistant Agriculture Officers and other government staff with an important role to play in supporting the delivery of different project outputs.

65. Vulnerable communities will be actively engaged in all project components. They will implement community-based adaptation and climate risk management activities under Outcomes 1 and 3 and be empowered through awareness, capacity development and active engagement to test and develop an agreement on benefit-sharing and co-management of coastal forests under Outcome 2. The MoEF fully recognizes the importance of ensuring that the voices of minorities and less vocal groups are heard, particularly of women and other disadvantaged groups. The coastal zone has a particularly large number of women-headed households (Section 2.3.3). This dimension has been taken into account in project design. Additionally, the project will make a very conscious effort to ensure that marginalized groups and individuals are able to participate effectively in project discussions and activities.

66. Additionally, Bangladesh has a very strong tradition of Civil Society Organizations (CSOs) including a range of NGOs and Community-based Organizations (CBOs) working in both rural and urban areas in a wide variety of fields. Many of these have an impressive track record of successful engagement of marginalized communities in programmes for poverty alleviation, health care, education and general empowerment. NGOs and CBOs which are active and committed to work on issues of natural resource and disaster risk management in the target regions will be contracted by MoEF or UNDP to work as local partners with communities on the development of community-based adaptation schemes.

67. Another key project stakeholder is the volunteer network supported by the CPP of the MoDMR. Working closely with the CDMP-II that is providing basic cyclone preparedness trainings, these volunteers in six project upazilas will receive additional trainings and gear to strengthen their capacity for delivering early warning communications on extreme climate events.<sup>67</sup> The CPP network will also be involved in raising awareness about the importance of coastal greenbelts for local resilience. Additionally, members of FRMGs established under Output 2.1, particularly women, will be encouraged to become CPP volunteers and receive training on disaster preparedness and response.

68. Research institutions such as the MoEF's Bangladesh Forest Research Institute (BFRI) and the MoA's Bangladesh Agricultural Research Council (BARC) and Bangladesh Rice Research Institute (BRRRI) are an invaluable source of technical knowledge, advice and support for the

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<sup>67</sup> Negotiations are currently ongoing with CDMP-II to expand their training programme to an additional upazila, which is currently not covered under the CPP/CDMP-II program.

design and implementation of specific climate change adaptation measures, for example, identifying the most appropriate climate resilient species to be planted as well as the best agricultural practices to be used in a given area.

69. Major stakeholders with a day-to-day implementation role and/or who are critical to the project's ultimate success are described in Table 3 below. Other important stakeholders, such as the numerous volunteer networks, CBOs and NGOs operating in the 4 target coastal districts and 7 Upazilas (subdistricts) are listed in the Stakeholder Involvement Plan in Annex 3, which also includes details of secondary stakeholders, who are likely to have an interest in the project's results but unlikely to play an active role in project implementation.

70. Further details of stakeholder consultations and reports are given in Annex 2 along with details of the names, functions, addresses and possible contributions of individual key stakeholders.

**Table 3: Major Project Stakeholders**

Stakeholders	Brief Summary of Mandate, Inputs to PPG & Role in Main Project
<b>National &amp; Subnational Government Line Ministries, Departments and other Bodies</b>	
Ministry of Environment & Forests (MoEF) and Bangladesh Forest Department (BFD)	<p>The Ministry of Environment &amp; Forests is the nodal agency in the administrative structure of the Central Government, for the planning, promotion, co-ordination and overseeing the implementation of environmental and forestry programs. MoEF activities cover the conservation and survey of flora, fauna, forests, and wildlife; pollution control; and the forestation, regeneration of degraded areas, and protection of environment.</p> <p>During PPG</p> <ul style="list-style-type: none"> <li>• Lead agency and overall coordination of project preparatory activities</li> <li>• Data and information about CC impacts</li> <li>• Participation and facilitation in meetings and workshops</li> <li>• Provision of guidance and inputs to the project design</li> </ul> <p>During project implementation</p> <ul style="list-style-type: none"> <li>• The Secretary of the MoEF will act as the National Project Director of the Project</li> <li>• The NPD will chair the Project Board and the National Steering Committee</li> <li>• Implementing Partner that will be responsible for executing the proposed project.</li> <li>• MoEF will host the PMU and also facilitate coordination with other relevant national stakeholders.</li> <li>• BFD will be the Responsible Party for Outcome 1</li> </ul>
Ministry of Land (MoL)	<p>Ministry of Land is entrusted with the land management and settlement of the Government owned lands (khas lands), sairat mahals (jalmahal, shirmp mahal etc.), vested properties and abandoned properties. Thus this ministry is in charge of land administration, management and development for the benefit of the people of Bangladesh.</p> <p>During PPG</p> <ul style="list-style-type: none"> <li>• Member of the National Steering Committee.</li> <li>• Review impacts of existing land use policies on the sustainability of protective greenbelt structures and develop policy recommendations for MoL to enhance the sustainability of coastal forest cover</li> <li>• Participation in meetings and workshops</li> </ul> <p>During project implementation</p> <ul style="list-style-type: none"> <li>• Member of the Project Board and National Steering Committee</li> <li>• Play key role in allocation of newly accreted coastal lands to BFD for afforestation and for further establishment of a co-management and forest benefit-sharing systems</li> <li>• Will be engaged closely to demonstrate multiple benefits generated from retaining a significant area of newly accreted lands as coastal greenbelts under new co-management mechanisms by BFD and local communities</li> </ul>

Stakeholders	Brief Summary of Mandate, Inputs to PPG & Role in Main Project
<p>Ministry of Agriculture (MoA)</p> <p>Department of Agricultural Extension (DAE)</p>	<ul style="list-style-type: none"> <li>• Will be a member of CMCs at the Upazila level</li> </ul> <p>The MoA's mandate is to build a profitable, sustainable and environment friendly agricultural system to ensure long-term food security of the people by increasing crop sector production and productivity through innovation and transfer of technology, increase efficiency of input management and assistance to agricultural programmes.</p> <p>The Department of Agricultural Extension (DAE) is the largest public sector extension service provider in Bangladesh. DAE has carried out research on adaptive agriculture and dissemination of climate resilient crop variety, promotion and extension of adaptive agriculture to farmers. DAE has also been actively involved in implementing selected activities under the CBACC project.</p> <p>During PPG</p> <ul style="list-style-type: none"> <li>• Member of the National Steering Committee.</li> <li>• Participation in meetings and workshops</li> </ul> <p>During project implementation</p> <ul style="list-style-type: none"> <li>• Member of the Project Board and National Steering Committee</li> </ul> <p>Local representatives of the DAE will be involved particularly in the delivery of Outputs 1.1&amp; 3.2 of this project. DAE will:</p> <ul style="list-style-type: none"> <li>• Provide guidance and training on agriculture-related livelihood activities</li> <li>• Contribute climate tolerant/suitable crops, horticulture and agro-forestry for livelihood diversification</li> <li>• Provide of field-level technical support to farmers in target Upazilas</li> <li>• Will be a member of CMCs at the Upazila level</li> </ul>
<p>Ministry of Fisheries &amp; Livestock (MoFL)</p> <p>Department of Fisheries (DoF) &amp; Directorate of Livestock Services (DLS)</p>	<p>The main functions of the Ministry of Fisheries and Livestock are to preserve fisheries resources, fulfill the requirement of animal protein through proper management and planned development, increase socio-economic conditions of fishermen, create employment opportunities for rural unemployed and landless people, expand foreign exchange earnings by exporting fish and fishery products and to innovate new technologies through research for fisheries development and preservation.</p> <p>The Department of Fisheries (DoF) is mandated to disseminate improved aquaculture technologies through training and demonstration and to render extension advisory services to the focal stakeholders. They also strive to enhance fisheries resources through enhancing conservation and management measures and facilitate alternative income generating activities for rural poor and unemployed people towards poverty alleviation.</p> <p>During PPG</p> <ul style="list-style-type: none"> <li>• Member of the National Steering Committee.</li> <li>• Participation in meetings and workshops</li> </ul>

Stakeholders	Brief Summary of Mandate, Inputs to PPG & Role in Main Project
	<p>During project implementation</p> <ul style="list-style-type: none"> <li>• Member of the Project Board and National Steering Committee</li> </ul> <p>DoF &amp; DLS will particularly contribute to Outputs 1.1 and 3.2.</p> <ul style="list-style-type: none"> <li>• Demonstrate &amp; support project training on climate resilient aquaculture to target project communities</li> <li>• Demonstrate &amp; support project training on climate resilient animal husbandry practices to target project communities</li> <li>• Provide inputs in the design of killas</li> <li>• Will be a member of CMCs at the Upazila level</li> </ul>
<p>Ministry of Disaster Management &amp; Relief (MDMR)</p> <p>Disaster Management Bureau (DMB)</p>	<p>The Ministry of Disaster Management and Relief (MoDMR) has been given the mandate to drive national risk reduction reform programmes. Its mission relative to this agenda is: “To achieve a paradigm shift in disaster management from conventional response and relief to a more comprehensive risk reduction culture, and to promote food security as an important factor in ensuring the resilience of communities to hazards”</p> <p>Department of Disaster Management (DDM) under the Ministry of Disaster Management and Relief is mandated to implement the objectives of Disaster Management Act by reducing the overall vulnerability from different impacts of disaster by undertaking risk reduction activities; conducting humanitarian assistance programs efficiently to enhance the capacity of poor and disadvantaged as well as strengthening and coordinating programmes undertaken by various government and non-government organizations related to disaster risk reduction and emergency response.</p> <p>During PPG</p> <ul style="list-style-type: none"> <li>• Member of the National Steering Committee.</li> <li>• Participation in meetings and workshops</li> </ul> <p>During project implementation</p> <ul style="list-style-type: none"> <li>• Member of the Project Board and National Steering Committee</li> <li>• At the subnational level, District Relief and Rehabilitation Officer (DRRO) and upazila level Project Implementation Officer (PIO) will be fully involved in the training programme targeted at the CPP volunteers under Output 3.1</li> <li>• Recipient of input from the project to incorporate climate change projections in the definition of disaster management plans, policies and projects</li> <li>• Bring synergy with future activities by Comprehensive Disaster Management Programme</li> <li>• Will be a member of CMCs at the Upazila level</li> </ul>
<p>Ministry of Water Resources (MoWR), Bangladesh Water</p>	<p>The Ministry of Water Resources is the apex body of the Government of Bangladesh for development and management of the whole water resources of the country. It formulates policies, plans, strategies, guidelines, instructions and acts, rules, regulations, etc. relating to the development and management of water resources, and regulation and control of the institutions reporting to it. It prepares and implements development projects relating to</p>

Stakeholders	Brief Summary of Mandate, Inputs to PPG & Role in Main Project
Development Board (BWDB)	<p>flood control and drainage (FCD); flood control, drainage and irrigation (FCDI); riverbank erosion control; delta development and land reclamation; etc. and provides irrigation, drainage, flood protection, bank erosion protection, land reclamation facilities by constructing barrages, regulators, sluices, canals, cross-dams, embankments and sea-dykes along the banks of the rivers and the coast, etc.</p> <p>Key function of BWDB is the construction and maintenance of the water management infrastructure in the country. Construction of coastal polders began in the 60s. About 125 polders with 5355 km embankment &amp; other structures. Saving human lives, livestock, crops from tidal flood &amp; storm surge Contribute in food security, rural employment &amp; communication development</p> <p>During PPG</p> <ul style="list-style-type: none"> <li>• Member of the National Steering Committee.</li> <li>• Participation in meetings and workshops</li> </ul> <p>During project implementation</p> <ul style="list-style-type: none"> <li>• Member of the Project Board and National Steering Committee</li> <li>• Technical assistance in the field of irrigation, flood control, anti-water-logging, drainage and anti-erosions for activities under Output 3.2</li> <li>• Will be a member of CMCs at the Upazila level</li> <li>• Key recipient of experience and lessons learned, especially from Output 1.1 as the land they own on either sides of embankments (1km) could potentially be leveraged for expanding the benefits of diversified livelihood strategies</li> </ul>
Ministry of Local Government Rural Development & Cooperative Division (MoLGRDC)  Bangladesh Rural Development Board (BRDB) Local Government Engineering Department (LGED)	<p>BRDB is the prime public sector organization working for 'Rural Development' and 'Poverty Alleviation' under Rural Development and Cooperative Division (RD&amp;CD) of the Ministry of Local Government Rural Development and Cooperative (LGRD&amp;C) of the government of the People's Republic of Bangladesh.</p> <p>Local Government Engineering Department (LGED) is one of the largest public sector organizations in Bangladesh entrusted for planning and implementation of local level rural urban and small scale water resources infrastructure development programs. The broad objectives of LGED's development activities are to improve the socio-economic condition of the country through supply of infrastructures at local level and capacity building of the stakeholders. LGED promotes labour-based technology to create employment opportunity at local level and uses local materials in construction and maintenance to optimize the project implementation cost with preserving the desired quality. LGED works in a wide range of diversified programs like construction of roads, bridges/ culverts and markets to social mobilization, empowerment and environmental protection.</p> <ul style="list-style-type: none"> <li>• Will be member of the National Steering Committee</li> </ul>



Stakeholders	Brief Summary of Mandate, Inputs to PPG & Role in Main Project
	<ul style="list-style-type: none"> <li>• Will be a member of CMCs at the Upazila level</li> <li>• Assist in the socio-economic development and empowerment of rural women through formation of formal and informal groups under cooperative programmes.</li> <li>• They will be the main government interface in relation to investments under Output 3.2.</li> </ul>
Local Government Institutions (Union Parishad, Upazila Parishad)	<ul style="list-style-type: none"> <li>• Implement development and service-oriented activities for climate change adaptation, disaster risk management and environment conservation. Mobilizing local resources, establish good governance, providing civic/utility services to municipalities and city corporations. Rural and urban infrastructures development, supply safe drinking water, solid waste disposal and sanitation.</li> </ul>
District Environment and Forest Development Committee (DEFDC), District Disaster Management Committee (DDMC) Upazila Development Coordination Committee (UDCC)	<p>There is a District Disaster Management Committee (DDMC) at the District level. There will be a plan for each District titled “District Disaster Management Plan” comprising both disaster risk reduction and emergency response to be prepared by the District Disaster Management Committee. While the UDCC coordinates all the development initiatives within the territory by all agencies either public or private.</p> <ul style="list-style-type: none"> <li>• Facilitate effective coordination of project at the district level</li> <li>• Local conflict resolution related to land use issues</li> <li>• Through UDCC, local government bodies such as Union Parishads, will be mobilized to facilitate the project</li> <li>• District committees may assign CBOs if necessary to implement livelihood related activities at local level as part of output 1.3.</li> <li>• Community mobilization by invitation of the Project Management Unit and any other component</li> </ul>
<b>Local communities/CBOs</b>	
Co-Management Committees (CMCs)	<ul style="list-style-type: none"> <li>• GoB gazetted community based organizations primarily involved in participatory natural resource management</li> <li>• Will act as the apex community organization involved in forest resources management along with the FD</li> <li>• Will facilitate dialogue between local communities and local government on coastal forest co-management and benefit-sharing and serve as the main platform for engagement of local communities in higher-level decision making processes on coastal greenbelts</li> <li>• Will also promote horizontal and vertical intersectoral dialogue and coordination at the Upazila level and above.</li> <li>• Seven CMCs will be established/supported – one in each target Upazila (2 already exist through the support from the first LDCF. But they will also receive additional trainings including benefit-sharing agreement)</li> </ul>
Forest Resource Management Groups (FRMGs)	<ul style="list-style-type: none"> <li>• FRMGs are the key village/community-level institution that will be empowered to engage actively in participatory coastal forest co-management and benefit-sharing</li> <li>• FRMGs will have representation on the CMCs</li> <li>• 40 FRMGs will be formulated</li> <li>• Members of FRMGs will be encouraged to join the CPP Volunteer group to receive additional trainings on the nexus of coastal greenbelts and disaster risk management</li> </ul>



Stakeholders	Brief Summary of Mandate, Inputs to PPG & Role in Main Project
Cyclone Preparedness Programme (CPP) Volunteer Group	<ul style="list-style-type: none"> <li>• They represent the key beneficiary of Output 3.1</li> <li>• At least 6,000 CPP volunteers will be exposed to awareness and training workshop on climate risks and natural benefits of coastal greenbelts in reducing the impacts of extreme events such as cyclones and tidal bore</li> </ul>
<b>NGOs/CSOs</b>	
Arannayk Foundation (AF)	<p>AF, also known as the Bangladesh Tropical Forest Conservation Foundation, has a long history of community engagement and alternative income generation in rural Bangladesh. AF will be carrying out the livelihood support in the baseline CRPAR project.</p> <p>During PPG, they provided information inputs on the potential areas of their operation; types of livelihood support activities envisaged; and joined discussions on beneficiary selection criteria for both the CRPAR project and LDCF projects.</p> <p>During the project implementation, they will sit in the LDCF Project Board and ensure close coordination on livelihood related activities.</p>
Other NGOs	<p>Other NGOs such as Practical Action Bangladesh, Center for Natural Resource Studies (CNRS), Bangladesh Center for Advanced Studies (BCAS), IUCN-Bangladesh, Gram Bikash Shayahak Sangstha (GBSS), Center for Advance Research in Natural Resources &amp; Management (CARINAM), World Fish Centre, and Concern Worldwide, etc will be called to participate in project activities or discussions, as necessary, based on the procurement guideline set by UNDP.</p> <p>All of these NGOs have been consulted during the PPG phase.</p>
<b>Government Research Institutions</b>	
Bangladesh Agricultural Research Institute (BARI), MoA	<ul style="list-style-type: none"> <li>• Implement activities related to innovative research by inviting research proposal</li> <li>• Conduction of field-level adaptation research on the introduction of saline-tolerant rice varieties, including adjusted cropping cycles to avoid high saline periods</li> <li>• Provision of training to project staff and farmers (including women) in adopting suitable vegetable and orchard cultivation technologies that have been tested in coastal areas (inputs from consultation)</li> </ul>
Bangladesh Rice Research Institute (BRRI), MoA	<ul style="list-style-type: none"> <li>• Implement activities related to innovative research by inviting research proposal</li> <li>• Conduction of field-level adaptation research on non-rice crop diversification</li> <li>• Demonstration of adaptive technologies in high-salinity areas</li> <li>• Provision of training to project staff and farmers in adopting suitable rice varieties that have been tested in coastal areas (salt and inundation tolerant varieties)</li> </ul>
Centre for Environment and Geographic Information Services (CEGIS)	<ul style="list-style-type: none"> <li>• Carryout research on climate change, climate modeling, prepared climate and disaster risk map, policy advocacy and training.</li> </ul>

Stakeholders	Brief Summary of Mandate, Inputs to PPG & Role in Main Project
Bangladesh University of Engineering and Technology (BUET) - Institute of Water and Flood Management (IWFM) / Climate Change Study Cell	<ul style="list-style-type: none"> <li>• Research and capacity development in water and flood management, climate related disasters and provide advisory and consultancy services; conducting various activities such as facilitating research, organizing short</li> <li>• courses, workshops and seminars, providing advisory services to government and relevant organizations, hosting international and national conferences, publishing journal, and developing climate change database.</li> </ul>
	<ul style="list-style-type: none"> <li>• Other research institutions will be involved on a needs-basis through competitive procurement and/or by invitation of the PMU</li> </ul>
<b>Major Development Partners</b>	
World Bank/BCCRF CRPAR project	World Bank is responsible for fiduciary management of Bangladesh Climate Change Resilience Fund (BCCRF), the multi-donor trust fund created to support climate change endeavors of the GoB. The LDCF project has been designed to build on a major new \$US35 million BCCRF-financed project on coastal afforestation/reforestation Climate Resilient Participatory Afforestation and Reforestation Project (CRPARP). Close consultations were held with BFD, BCCRF and Aranayk Foundation during the project preparation phase to ensure close alignment with the BCCRF project and avoid duplication with AF. CRPAR project will remain a key partner throughout LDCF project implementation as detailed further in the Project Strategy.
USAID/CREL	USAID is one of the leading development partners in Bangladesh, particularly in areas of natural resource management. USAID pioneered participatory natural resource management through their M ACH, NSP, IPAC and most recently CREL project. CREL project will serve as a co-financing partner of the project and will complement activities of the project, particularly in areas of participatory forest management.
IFAD/CDSP-IV	The Char Development and Settlement Project (CDSP) IV project implemented by Bangladesh Water Development Board with an overall budget of USD 89.2 million financed by IFAD, Government of the Netherlands and GoB operated in Noakhali, Laxmipur and Chittagong. The goal of the project is reduced poverty and hunger for poor people living on newly accreted coastal chars. This would be achieved via the purpose of improved and more secure livelihoods for 28,000 households.
Special Program for Climate Resilience (SPCR)	<p>During the project formulation phase of SPCR and of LDCF, periodic exchanges have been made with regards to the design of both projects. The areas of investments envisaged in SPCR are inside coastal embankments whereas large part of project activities under LDCF will be outside coastal embankments except Output 3.2. The geographical overlap between the SPCR and LDCF is limited to 2 Upazilas out of the 16 Upazilas SPCR operates in. They are Hatya and Char Fasson. MoEF has therefore decided that the LDCF resources, under Output 3.2, will not be invested in Hatya and Char Fasson to avoid overlap.</p> <p>Nonetheless, they will be invited to project lessons and experience sharing workshops and events to ensure that successful demonstrations of livelihood strategies, tested both inside embankments (in SPCR) and largely outside</p>

Stakeholders	Brief Summary of Mandate, Inputs to PPG & Role in Main Project
	embankments (in LDCF), will be shared.
IUCN-Bangladesh	IUCN-Bangladesh has institutional knowledge of Bangladesh's coastal green belt development experience over the past five decades and is thus an invaluable source of historical and current technical knowledge. IUCN Bangladesh was consulted during the PPG to obtain a better understanding of the threats to coastal green belts and the underlying barriers to long-term sustainability. IUCN also supports the Mangroves for the Future (MFF) programme in Asia, which is another important source of technical knowledge and practical experience from which this project can benefit. IUCN will continue to be consulted by the project on a needs-basis.

## II STRATEGY

### 1. Project rationale & policy conformity

71. Bangladesh's overarching development goals are to achieve middle-income country status and to reduce the poverty headcount from 32% to 15% of the population by 2021. The Government of Bangladesh (GoB) is acutely aware that climate risks have the potential to delay the achievement of its main development priorities as well as to reverse hard-won development gains. In 2005, the Government concluded the development of Bangladesh's National Adaptation Programme of Action (NAPA), following extensive consultations with communities, professional groups, and other members of civil society. Following a similar line of reasoning as the Initial and Second National Communications of Bangladesh to the UNFCCC, the NAPA document made a compelling argument that risk reduction in coastal areas of Bangladesh can only be achieved if the maintenance of protective greenbelts is connected to tangible livelihood support and economic development options for adjacent communities. Thus, the NAPA identified the "reduction of climate change hazards through coastal afforestation with community participation" as number one adaptation priority, valued at US\$23 million. The importance of coastal afforestation and expansion of coastal greenbelts was reiterated in the revised NAPA of 2009, which includes as a priority: "Afforestation including expansion of the coastal greenbelt".

72. The project will implement these urgent priority interventions identified in Bangladesh's NAPA and will also contribute to a number of short-term priorities identified in the revised 2009 NAPA by contributing to: "emergency preparedness measures to cope with enhanced climatic disasters"; and "popularization of already released salinity resistant crop varieties." Thus, the project will reduce the vulnerability of extremely poor and highly exposed coastal communities to existing climate variability and future climate change-related risks through a combination of measures that will strengthen both people's adaptive capacity and the long-term resilience of coastal greenbelts in Bangladesh. The project will also help transform the way in which coastal afforestation and reforestation programmes are designed and developed in Bangladesh and thereby also contribute to national poverty reduction and development goals.

73. Specifically, the proposed project supports the priorities of The National Strategy for Accelerated Poverty Reduction II (Revised FY2009-2011), which emphasizes mainstreaming and strengthening climate change adaptation across various sectors and reinforces the need for climate change resilient afforestation and reforestation in newly accreted coastal lands and degraded hill forests. The National Strategy also emphasizes community participation, especially greater women's involvement in the afforestation program.

74. The project will also support the objectives of Bangladesh's Sixth Five Year Plan (FY2011-FY2015), which is aligned with the NSAPR II. This Plan emphasizes the need to afforest and reforest an estimated 40,000 ha of coastal land, 7,000 ha of plains forest land and 250,000 ha of hill forest land by 2015. In order to reduce damage by cyclones and tidal surges, the plan envisages creating a coastal greenbelt and enhancing access to the inputs required for coastal greenbelt establishment, including seeds and seedlings.

75. The project is also aligned with the Bangladesh Climate Change Strategy and Action Plan (BCCSAP 2009), which presents a comprehensive (but unbudgeted) 10-year action plan (2009-

2018) for both adaptation and mitigation.<sup>68</sup> Among other key areas, the strategy highlights adaptation and expansion of the 'greenbelt' coastal afforestation program, with mangrove planting along the shoreline, and the social forestry program. Activities under the BCCSAP fall under 6 pillars: (1) food security, social protection and health, (2) comprehensive disaster management, (3) infrastructure, (4) research and knowledge management, (5) mitigation and low carbon development, (6) capacity building and institutional strengthening. The Ministry of Environment coordinates activities under the BCCSAP and has established a Climate Change Secretariat to implement the plan. The proposed project aligns directly with activities under all 6 pillars, with particular relevance to pillars 1, 2, 3 and 6.

76. By piloting forest-benefit sharing mechanisms in coastal greenbelts, the project will contribute to some of the key objectives of the National Forest Policy 1994, which include ensuring that the benefits of forestry sector development are equitably distributed among the people, especially whose livelihood depends on trees and forests. The policy also emphasizes increasing the scope for people's participation in afforestation programs, including employment opportunities, and paying due attention to maintenance of ecological stability and biodiversity. Another important objective of the 1994 Forest Policy is to maintain 20% of Bangladesh's total area under forest cover.

77. Social forestry was included in the Forest (Amendment) Act of 2000 and the Social Forestry Rules developed by the Ministry of Environment and Forests (MoEF) were approved in 2004 (amended 2010 and 2011). The Rules define the process of beneficiary selection, roles and responsibilities of different stakeholders, management, capacity building and distribution of earnings from social afforestation. The Rules address important policy objectives and priorities to meet poor people's requirements for fuelwood, timber, fodder and other Non-Timber Forest Products (NTFPs), as well as to provide employment opportunities and income generation. The Rules are thus especially targeted at the most vulnerable and include gender-sensitive targeting among the criteria for beneficiary selection. These Rules have brought about important changes in prevailing patterns of mainland forest management, with notable success in increasing local participation in afforestation and reforestation programmes and poverty reduction through income and employment generation and other forms of forest benefit-sharing. For example, the revised Social Forestry Rules stipulate that the communities responsible for the maintenance of plantations will receive 75% of timber value of the forest on short rotation. However, the Rules are currently applicable to only mainland forestry programmes. This LDCF project will contribute to expanding the purview of these Rules to coastal mangrove forests, thereby linking the objectives of the Bangladesh NAPA, Sixth Five-Year Plan, BCCSAP and National Forest Policy with those of the Social Forestry Rules.

78. The National Land Use Policy seeks to ensure the rational use of the country's land and waterbodies and to restrict misuse and inappropriate use of such resource. It also contains provisions for redistribution of state-owned (khas) land to the landless and the marginalized poor and for safeguarding the legitimate rights of marginalized community (indigenous peoples) in respect of land ownership and use, including community-owned land and rights of use.

79. The Coastal Zone Policy (CZP) is built on different sector policies of the Government of Bangladesh. The policy states that the coastal development process aims to comply, on an overall basis, with: the National Goal for Accelerated Poverty Reduction (PRSP); the Millennium Development Goals (MDGs), the Code of Conduct for Responsible Fisheries and with other

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<sup>68</sup> BCCSAP estimates that the total cost of programmes in the action plan is \$500 million in the first 2 years of implementation and in the order of \$5 billion for 5 years.

international conventions and treaties. The CZP establishes the goal of integrated CZ management: “to create conditions, in which the reduction of poverty, development of sustainable livelihoods and the integration of the CZ into national processes can take place”. More specifically, the development objectives as described in the CZP include: economic growth; basic needs and opportunities for livelihoods; reduction of vulnerabilities; sustainable management of natural resources; equitable distribution; empowerment of communities; women’s development and gender equity and conservation and enhancement of critical ecosystems. The Coastal Development Strategy (CDS) is the “linking pin” in the ICZM process, linking the CZP with concrete development programs and intervention. In general terms, objectives of the CDS are: to select strategic priorities and actions in implementation of the CZP with emphasis on the creation of the institutional environment that will enable GoB to embark on a continuous and structured process of prioritization, development and implementation of concerted interventions for the development of the CZ.

## **2. Country ownership: country eligibility and country drivenness**

80. The project has been developed in line with LDCF guidelines and is aligned with the updated Results-Based Management Framework for the LDCF and SCCF (GEF/LDCF.SCCF.9/Inf.4 of October 20, 2010) and the Adaptation Monitoring and Assessment Tool for the Least Developed Countries Fund (GEF/LDCF.SCCF.9/Inf.4 from October 20, 2010). It corresponds to Objective CCA-1 “Reducing Vulnerability: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level”. The project will contribute to Outcomes 1.1 “Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas” and 1.3 “Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas” under this Objective, specifically to Outputs 1.1.1 “Adaptation measures and necessary budget allocations included in relevant frameworks” and 1.3.1 “Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability”

81. Bangladesh signed the United Nations Framework Convention on Climate Change (UNFCCC) in June 1992 and ratified it in April 1994, with entry into force in July 1994. Bangladesh is also one of the world’s 49 Least Developed Countries (LDCs). The country is thus eligible for LDCF funding and this project has been endorsed by the GEF Operational Focal Point (OFP). It is also eligible for technical assistance from UNDP.

82. Conscious of the country’s vulnerability to climate change, GoB has been developing national working groups and policies (Section 2.1) related to climate change adaptation for several years. In 1992, the GoB established an Inter-ministerial Committee on Climate Change headed by the Minister for Environment and Forest (MoEF), with representation from relevant government ministries and departments as well as key non-governmental organizations (NGOs) and research institutions. The Department of Environment (DoE) under the MoEF has set up a Climate Change Cell (CCC) to act as Secretariat for climate change related work within the government. There is also a National Environment Committee (NEC) to determine environmental policies chaired by the Prime Minister and with representation from Members of parliament (MPs) as well government and civil society. These groups and platforms have been instrumental in determining the country’s strategic positions on climate change while maintaining a cross-sectoral approach to tackling the issue. The proposed LDCF project will utilize these high-level platforms to discuss and disseminate strategic policy issues arising from the project.



83. The project is exclusively country-driven and has been developed in a participatory manner. Consistent with the Conference of Parties (COP-9), the project will implement urgent priority interventions identified in Bangladesh's first NAPA in 2005 and reiterated in the country's revised NAPA of 2009, thereby satisfying the criteria outlined in UNFCCC Decision 7/CP.7 and GEF/C.28/18. Also in accordance with LDCF eligibility criteria and guidelines, LDCF resources will be used to finance the additional costs of ensuring that baseline programmes are made resilient to climate change risks. The project has been designed to complement and increase the adaptive value of existing major baseline government programmes on coastal afforestation and reforestation, most notably the Climate Resilient Participatory Afforestation and Reforestation (CRPAR) Project supported by the Bangladesh Climate Change Resilience Fund (BCCRF; see Section 2.3.2). Other important baseline projects that will be complemented are discussed further under Section 2.3.3.

84. The project is well-coordinated with a number of other LDCF and non-LDCF-funded projects such as the CBACC project (Section 2.3.1) and the second phase of the Comprehensive Disaster Management Programme, a joint initiative of GoB and UNDP (Section 2.3.2). It will also integrate climate change risk considerations into areas that are identified in LDCF guidelines as priority interventions eligible for LDCF support, notably coastal development and forest management. Thus the project will

1. Expand the resilience of natural and social systems against climate change hazards, focusing on the community level;
2. Enable the development of response strategies to reduce the adverse effects of sea level rise;
3. Improve local and national awareness and understanding of the benefits of preparedness for climate change risks.

These priorities are in line with the expected interventions articulated in the LDCF programming paper and decision 5/CP.9.

85. The project is also in line with the new UN Development Assistance Framework (UNDAF 2012-2016), which was endorsed by the Government of Bangladesh in June 2011, and the UNDP Country Programme Document (2012-2016). These major assistance frameworks to the Government of Bangladesh emphasize the UN's goal to promote equitable and sustainable growth in Bangladesh that contribute to faster and more efficient poverty reduction and sustainable use of natural resources in a changing climate. The project is fully aligned with: a) UNDAF Outcome 5.1: 'By 2016, populations vulnerable to climate change and natural disaster have become more resilient to adapt with the risk' and partly aligned with Outcome 5.2: By 2016, vulnerable populations benefit from natural resource management and environmental governance and low emission green development under UNDAF Pillar 5 on "Climate Change, Environment, Disaster Risk Reduction and Response"; and b) UNDP Country Programme Outcome 3.1 'Improved resilience of vulnerable communities and institutions to adapt to risks' and Outcome 3.2 'The poor and vulnerable benefit from better management of natural resources and access to low carbon energy'.

86. It is important to note that the new UNDAF for 2012-2016, which has been formulated and endorsed by the UN Country Team on the basis of an MDG gap analysis, has defined UNDP as the lead UN agency for Climate Change, Environment, Disaster Risk Reduction and Response. This role was assigned on the basis of long-standing technical and financial support to the government of Bangladesh in the implementation of the Bangladesh Climate Change Strategy

and Action Plan (BCCSAP), the NAPA, National Plan for Disaster Management (NPDM 2010) and existing disaster risk reduction frameworks such as the CDMP.

### **3. Design principles and strategic considerations**

#### *2.3.1 Building on the first LDCF Project*

87. The LDCF-financed Community-Based Adaptation to Climate Change through Coastal Afforestation in Bangladesh (CBACC), which started implementation in 2009, is Bangladesh's first NAPA follow-up project. This project, which recognizes vulnerable communities both as victims of climate change as well as critical partners for finding and sustaining adaptation solutions, is supported by UNDP and jointly financed by the LDCF (3.3 million USD), UNDP (1.1 million USD) the Government of Bangladesh (1 million USD), Swiss Development Corporation (2.17 million USD), and Embassy of the Kingdom of the Netherlands (0.98 million USD). This project, which is currently in its fourth year, has focused on community-based afforestation and livelihood diversification in the coastal districts of Patuakhali, Bhola, Noakhali and Chittagong and has delivered a number of highly visible, substantive results, demonstrating how 'business as usual' afforestation activities can be reoriented to:

- Incorporate a climate-resilient mix of mangrove and non-mangrove varieties;
- Adopt new planting patterns and techniques to enhance the protective and economic functions of new greenbelts; and
- Couple livelihood diversification and support actions with the planting of new greenbelt structures to create incentives for communities to maintain the long-term integrity and protective utility of the new plantations.

88. The CBACC project has received important national and international recognition, including an award for innovation at the 5th International Conference on Community-Based Adaptation, and was featured in a Discovery Channel documentary. MoEF was also awarded JSW - the Times of India Earth Care Award 2012 in community based adaptation category for implementing this project. Apart from the tangible results of planting 6,000 ha of mangroves and more than 500 ha of non-mangrove species for additional income and land stabilization, one of the key achievements of the CBACC project in the policy area was the issuance of a government standing order to designate and retain 50% of mangrove plantation as coastal greenbelts. This issuance is pivotal, in principle, to ensure BFD's ownership and control over the greenbelts for an extended period, increasing the likelihood of maintaining these forests in a relatively intact state. However, as discussed in the barrier section, many other gaps remain in policy implementation and compliance as well as in terms of misaligned incentives of various key actors. Thus, substantive change at the local level in terms of reduction of anthropogenic threats to coastal forests will only materialize if there are sufficient tangible, visible and practical examples of adaptation, at much greater scale geographically, that can be accessed and understood by local-level institutions and authorities. Consequently, there is need to replicate and scale up adaptation measures successfully tested through CBACC and to pilot additional measures targeted at the most vulnerable and exposed along the coastline to institutionalize climate-smart afforestation and reforestation and gain the attention of civil society organisations and District, Union and Upazila officials.

89. Against this backdrop, the proposed project is aimed at much larger transformational change across the coastal zone building on the important foundations laid by the CBACC project. Such change will be brought about by demonstrating the benefits of integrating local

livelihood strategies in coastal afforestation and reforestation and greater species diversification of coastal greenbelts to alter the existing incentive structure for local communities, which currently revolves around once-off daily wage labour, and replace it with a greater stream of benefits from in-situ forests, thereby enhancing the long-term sustainability of coastal forests. Only districts in which 'business as usual' afforestation programmes can be coupled and strengthened with additional resources to provide back-to-back livelihood support and community-based adaptation benefits will be able to replicate 'what works' in community-based adaptation.

### *2.3.2 Emerging large-scale coastal afforestation and reforestation programmes*

90. The most critical baseline project on which the proposed LDCF project will be built is the new \$US35 million coastal afforestation/reforestation Climate Resilient Participatory Afforestation and Reforestation Project (CRPARP) financed by the Bangladesh Climate Change Resilience Fund (BCCRF) and implemented by the Forest Department. The project has three components as follows: 1) Afforestation and Reforestation Programme; 2) Alternative Livelihoods to Support Forest Communities; and 3) Capacity Development for Forest Resources Planning and Management. The CRPARP project will work in 9 out of Bangladesh's 19 coastal districts, namely: Cox's Bazar, Chittagong, Noakhali, Laxmipur, Feni, Barisal, Patuakhali, Barguna and Bhola. In total, 17,000 ha of block plantations and 1,672 km of strip plantations will be established, including 5,700 ha of mangrove afforestation in coastal areas.

91. A critical strategic principle that underlies the design of the proposed LDCF project and thus offers an important interface with the CRPARP project, is that the notion of 'resilience' as embraced by the CRPARP project, which stems primarily from the fact that mangrove plantation takes place in coastal districts, with the underlying assumption that established plantations will remain intact and provide the necessary natural buffer against extreme events. However, as analysed in the Barriers sections (Section 1.5), there are multifaceted factors that currently threaten the sustainability of the greenbelts – most importantly misaligned incentives that drive exploitation of coastal forests and char lands and the predominant focus on single-species plantation in the early phase of establishment without sufficient attention to the need to diversify and foster greater stewardship of these forests. In other words, large-scale plantation of coastal forests alone, without addressing the driving force that prompts community members to exploit and degrade forest resources will offer only limited adaptation benefits in the long-run<sup>69</sup>. The MoEF envisages that LDCF investments, through providing alternative livelihood options in areas adjacent to CRPARP coastal plantation sites, generating additional options for communities to benefit more directly from forests and promoting community co-management of the greenbelts (see below), will increase the adaptive value of the CRPARP investments greatly. Furthermore, as described above, those alternative livelihood options that will be promoted have already been tested on a smaller scale in the CBACC project and therefore significant efficiency gains are expected in the way such options are delivered.

92. During the preparatory phase of the LDCF project, a series of consultations took place, between MoEF, BFD, UNDP, the World Bank and the Arannayk Foundation (AF), which will implement the alternative livelihood options in CRPARP, UNDP and the World Bank, to determine the specific locations of the alternative livelihood interventions vis-à-vis BCCRF-funded

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<sup>69</sup> It is important to note that BCCRF in fact has a component that focuses on alternative livelihoods. However, this component has earmarked funding of only 10% of the total project budget, which is considered too small to reduce the anthropogenic driver of forest exploitation in search for economic opportunity.

afforestation/reforestation activities. As the specific locations of the BCCRF-funded afforestation/reforestation activities at the Union/Upazila level are still under discussion within the BFD and World Bank, agreements on the specific sites for LDCF interventions have not been obtained to date. However, based on the preliminary workplans of CRPAR project and AF, the MoEF has identified seven Upazilas for LDCF interventions where CRPARP coastal mangrove afforestation will take place and where there are options to work in a complementary manner with the AF. Furthermore, to ensure alignment between the BCCRF- and LDCF-funded projects, the LDCF project's beneficiary selection criteria have been jointly reviewed by BFD, AF and UNDP to ensure that these are consistent with those being used by BFD and AF under the CRPAR project (see Annex 4 for further details).

### 2.3.3 Co-Management of Coastal Forest Resources

93. Co-management or community-based management of natural resources has gained wide currency in recent years both globally and in Bangladesh as a potential mechanism for transforming the incentive structure of natural resource use to promote more sustainable use and reduce conflicts over natural resources. Co-management in the context of natural resources management can be broadly defined as:

*“a partnership arrangement in which a resource user group gets the right to use natural resources on a defined area of state owned land along with the responsibility to sustainably manage the resources (including protection).”*<sup>70</sup>

Co-management thus sits in the middle of a spectrum of possible governance arrangements that range from full state control to full community-control and is based on the principles of negotiation, joint decision-making, a degree of power and responsibility-sharing and equitable distribution of benefits among all stakeholders.

94. Experiences and lessons from past co-management initiatives in Bangladesh, notably some of the work undertaken by CBACC and several major USAID-supported programmes include the following: the Nishorgo Support Project 2003-2008 (NSP); the Management of Aquatic Ecosystems through Community Husbandry Project 1998-2008 (MACH); and the Integrated Protected Area Co-management 2008-2013 (IPAC) Project. USAID's longer and more extensive experience has clearly demonstrated the potential benefits of a co-management approach in the context of wildlife protected areas, including areas of natural forests, and inland aquatic resources, while CBACC's smaller-scale efforts in the coastal zone are also showing promise in terms of increasing community engagement with local government on adaptation planning. To date, CBACC remains the only initiative that implements co-management approaches in coastal greenbelt forests.

95. A key strategy of the proposed LDCF project is to alter the existing incentive structure that promotes forest degradation by linking interventions to increase local livelihood resilience with maintenance of coastal greenbelts and by complementing such interventions with more tangible benefits to local communities from coastal forests along with a greater role in their management and stewardship. To deliver this approach, the proposed LDCF project will work closely with the

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<sup>70</sup> K. Schmitt 2009, Management of Natural Resources in the Coastal Zone of Soc Trang Province. Protection and sustainable use of coastal wetlands through co-management and mangrove rehabilitation with emphasis on resilience to climate change. GIZ (formerly GTZ). P. 7

new USAID-funded Climate Resilient Ecosystems and Livelihoods Programme (CREL). This US\$36 million programme, launched in March 2013 and due to run until 2017, builds on the successes of Nishorgo, MACH and IPAC and will focus on expanding and strengthening USAID's support for co-management in key areas of wetland and forest.

96. The proposed LDCF-project will partner with USAID's new CREL project to apply USAID's vast experience on co-management in wildlife Protected Areas (PAs) and inland wetlands of Bangladesh to the coastal greenbelts of the country. CREL is thus another major project cofinancier and will particularly support the formation and capacity development of CMCs and benefit-sharing agreements that promote the sustainable management of coastal forests outside wildlife PAs in selected target project sites. The LDCF-project will thus contribute to a new area of knowledge and expertise on co-management in Bangladesh, which will be widely disseminated through a variety of mechanisms, including at least one national workshop to exchange lessons on co-management in different contexts within the country.

#### *2.3.4 Gender considerations*

97. While Bangladesh has made enormous progress in advancing gender equality in some areas such as enrolment in primary and secondary school, there is still much to be done to achieve the goal of gender parity across sectors and women's empowerment generally. Equal opportunity is still not a reality for most women in Bangladesh. Wage employment opportunities for women remain low, and despite expansion of the readymade garments industry, only one in seven women is engaged in wage employment outside the agricultural sector. Women earn less than half the income of their male counterparts for the same work and the number of poor women is higher than the number of poor men. Indeed, the majority of the extremely poor are women and there is also a higher proportion of female-headed households among the extreme poor.<sup>71</sup>

98. In promoting community-based adaptation at the local level, the project recognizes that risks associated with climate change threaten to reinforce gender inequalities and erode progress that has been made towards gender equality and women's empowerment. Poor women's limited access to resources, restricted rights, limited mobility and voice in community and household decision-making can make them much more vulnerable than men to the effects of climate change. This can lead to unfortunate consequences for all, as women play a unique role in the stewardship of natural resources and support to households and communities. With their knowledge, they can shape adaptive mechanisms in vulnerable areas.

99. This LDCF financed project makes a conscious effort to empower women and their involvement in advancing resilience. This will be achieved in a number of ways. For example, consultations during the project preparatory phase with the BFD and AF resulted in an agreement to emphasize women, particularly women-headed households, as a key criterion for selection of project beneficiaries for both LDCF and BCCRF-funded CRPAR projects. Additionally, LDCF financing will be used to promote participation of female members in the Forest Resource User Groups and Co-management Committees that are established to pilot forest-benefit sharing mechanisms. Furthermore, one of proposed activities under Output 1 includes a field assessment, in year 2 or 3, which looks into the extent to which women's participation in CBOs and selection as project beneficiaries is adhered to according to the agreed selection criteria and propose areas of improvement, if any.

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<sup>71</sup> BTI 2012



100. Interventions envisaged under Outcome 3 will also specifically address the differentiated needs of women during the time of climate-induced natural disasters. Natural disasters are the times when differential impacts of climate change on men and women are most starkly manifested as the differences in economic and socioeconomic status between men and women are directly linked to the survival rate<sup>72</sup>, and some estimate that women and children are 14 times more likely to die during natural disasters<sup>73</sup>. In Bangladesh, in particular, women are generally responsible for taking livestock, which is often the only asset for the poor, to safe havens and they often fall victim during this time. Some of the investments under Outcome 3 are directly in response to reduce such tragedies.

### 2.3.5 UNDP comparative advantage

101. UNDP's comparative advantage for the proposed project lies in its long-standing experience of providing technical assistance and financing to the Bangladesh government on climate change, including community-based adaptation and disaster risk reduction with a strong focus on capacity development and policy support. This has included support to the formulation of INC, SNC and TNC, formulation and implementation of the Bangladesh NAPA and the Bangladesh Climate Change Strategy and Action Plan (BCCSAP). UNDP was also selected as the lead agency to support Bangladesh's first LDCF-funded NAPA follow-up project, the CBACC project. The UNDP Bangladesh Country Office, with a dedicated officer, provides the primary interface with the partner Government through the lifetime of these programmes. Technical aspects of project implementation are supported by a dedicated technical advisor based in Bangkok and a senior technical advisor based in New York. The global network of the region-based advisors enables sharing and dissemination of knowledge beyond the country and region.

102. Financially, UNDP is contributing 2 million USD in parallel co-financing. This LDCF-financed project will be building on the achievements and lessons learned by UNDP during the course of supporting the design and implementation of the CBACC project. It is important to note that UNDP played an instrumental role in supporting the GoB and mobilizing additional grants from the Swiss Agency for Development and Cooperation (SDC) and the Embassy of the Kingdom of the Netherlands (EKN), totalling USD 3.15 million, to expand the successful implementation of the CBACC project. UNDP's extensive in-country partnership with these donors and track record in project assurance, which facilitated such partnership building in the CBACC project, will surely be drawn upon during the implementation of the proposed LDCF project.

103. In addition, UNDP is implementing the second phase of the Comprehensive Disaster Management Programme (CDMP-II) on behalf of GoB. This is a 5-year, multi-donor framework supported by UNDP, DFID, the EU, Sida, Norad and AusAID launched in 2010, with an overall budget of USD 76.32 million, to follow on from the first phase of CDMP (2003 – 2009). This programme offers important baseline development for the proposed LDCF project. Additionally,

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<sup>72</sup> See for example, Neumayer, E. & T. Plumper. (2007). The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981-2002. *Annals of the Association of American Geographers*, 97 (3). pp.551-556.

<sup>73</sup> Soroptimist International of the Americas. (2008). "Reaching Out to Women When Disaster Strikes." White Paper: Disaster Relief. Philadelphia, PA: Soroptimist International of the Americas.  
<[http://staging.soroptimist.org/whitepapers/wp\\_disaster.html](http://staging.soroptimist.org/whitepapers/wp_disaster.html)>



UNDP has supported the implementation of a number of GEF-financed biodiversity projects, all of which have emphasized capacity development and aspects of community-based approaches to environmental management.

104. As a result of the agency's close engagement on issues relating to poverty reduction, sustainable development and environmental sustainability in Bangladesh and globally, UNDP has been identified as the lead UN agency for Pillar 5: Climate Change, Environment, Disaster Risk Reduction and Response in Bangladesh under the new UNDAF for 2012-2016.

### *2.3.5 Expected benefits*

105. Coastal greenbelts perform multiple functions. A thick mangrove forest belt along the coastal zone can greatly reduce the impacts of cyclones, high winds and storm surges, particularly in the more exposed parts of the delta. Mangroves also trap sediment and contribute to new land accretion (thereby countering trends in erosion and sea level rise) as well as providing a range of other valuable ecosystem services, such improved productivity of local fisheries and the provision of fuel, fibre, fodder and other products.

106. Engaging with community-based afforestation and disaster risk reduction measures, community members in each vulnerable target district will not only benefit directly from cash-for-work and seeds-for-work approaches applied by the baseline project, but also from climate change adaptation benefits that persist long after project completion. At the local level, communities will benefit from increased resilience to climate related disasters through timely reception of early warning information; improved access to natural capital, such as forest, food and fiber plots, aquaculture ponds and livestock rearing facilities; improved human capital through involvement in forestry-related and non-forestry-related training activities in climate risk management; improved access to physical capital through climate-proofing of communal infrastructure; and improved financial and political capital as a result of greater community mobilization through Co-Management Committees, Forest Resource Management Groups and an innovative benefit-sharing agreement for coastal forests. These activities will enhance human security to climate change and increase the number of local economic and social development opportunities.

107. Similar to the benefits communities are deriving from Bangladesh's first NAPA follow-up project (CBACC), both men and women will be engaged in nursery and forest management activities. For example, engagement of women in the project activities in two districts of Barguna and Bhola recorded 46.37% and 42.6%, respectively, and activities that render land ownership and resilient income generation activities involved more than 40% women beneficiaries in all project sites. The same principle and strategy of mobilization of women, encouragement, and preferential selection into project activities, all of which run through the CBACC project will be adopted in the proposed project intervention.

108. More specifically, through a series of investments and technical assistance envisaged across three Outcomes of the proposed project, tangible adaptive benefits will be delivered to:

- 10,500 households (or approximately 50,000 individuals) through diversified alternative livelihood strategies in coastal afforestation/reforestation sites
  - 500 households through the FFF model
  - 2,500 households through resilient agricultural techniques and crop varieties
  - 2,500 households through diversified livelihood support specifically targeting fishing households

- 2,500 households through diversified/resilient livestock rearing practices
- 2,500 households through other innovative resilient livelihood strategies such as apiculture and honey processing, seedbeds nursery, floating vegetable cultivation, cultivation and marketing of flowers
- 2,500 individuals (or 50% of the total members of Forest Resource Management Groups) obtain access to coastal forest benefits through benefit-sharing agreement
- 6,000 CPP volunteers are trained on climate change induced disasters and DRR benefits of coastal greenbelts
- Approximately 21,000 individuals through protection of communal livelihood assets
  - 5,000 individuals' livelihood safeguarded through installation of drainage facilities through coastal embankments
  - 15,000 individuals' livestock find safe havens through construction of killas (raised earthen platforms) next to evacuation shelters
  - 200 households through improvement/climate-proofing of freshwater infrastructure

A full-time M&E officer will be hired to ensure that the implementing partner, responsible party, officers at the district and upazila levels and project-financed Community Development Associates/Assistants are sufficiently capacitated to monitor and track these benefits.

109. At national level, socioeconomic benefits will be enhanced through the integration of community-based approaches into ongoing and planned afforestation and reforestation frameworks and investment programmes. A forest product benefit sharing agreement between government and local communities (under Outcome 2) will ensure that there are economic incentives for the management and nurturing of new greenbelt plantations. By promoting active community engagement across all Outcomes, this project will improve public ownership, reduce conflict and create a culture of integrated land and resource management. This will address the need for greater community engagement outlined in the Bangladesh Climate Change Strategy and Action Plan.

110. Finally, through engagement and training of community-based organisations, the project will develop institutional capacity at the local level, which will support communities' political engagement, advocacy and participation in participatory, forward-looking risk management. This will greatly be assisted by UNDP's long-standing track record working with CBOs in the project areas on a variety of livelihood support and disaster management tasks.

### *2.3.6 Avoiding duplications with major development / adaptation initiatives*

111. As presented in the PIF, the Special Program for Climate Resilience (SPCR) is one of the major adaptation projects that is currently under implementation in coastal areas of Bangladesh. The three-pronged focus of the project is: 1) Promoting Climate Resilient Agriculture and Food Security; 2) Coastal Embankments Improvement and Afforestation; and 3) Coastal Climate Resilient Water Supply, Sanitation, and Infrastructure Improvement. They are currently working in 16 Upazilas, of which two (Hatiya and Char Fasson), overlap with the upazilas targeted under the LDCF project. However, it is important to note that the primary focus area of SPCR is *inside* the embankments (i.e. polders) while that of the LDCF project is *outside* the embankments due to its strong alignment with the coastal afforestation/reforestation work of CRPAR project. The only possibility of overlap is investments envisaged under Output 3.2 – i.e. drainage along the embankments and “climate-proofing” of small-scale water infrastructure (through concrete-lining or raising the platform). The former will be inside the embankments and

the latter could also be inside them, depending on the more detailed site assessments during the inception phase. At the same time, the preliminary assessments of MoEF carried out during the PPG identified that the need for drainage and climate-proofing of water infrastructure is particularly high in the following upazilas:

- Golachipa, Hatiya, Patharghata and Rangabali for climate-proofing of water infrastructure
- Char Fasson, Hatiya, Monpura for improving drainage along the embankments

112. Given the limited resources in LDCF funding and to avoid potential overlap of investments with SPCR, MoEF therefore decided to focus on Golachipa, Patharaghata and Rangabali for water infrastructure investments and Monpura for drainage investments.

113. That said, SPCR will be an important development partner for exchanging lessons and experiences of climate resilient agricultural practices, climate proofing of small-scale infrastructure, and various other aspects of working in coastal districts as the implementation of the respective projects progresses. Sharing of lessons will be facilitated at two levels in this regard. First, the implementation arrangement of the LDCF project stipulates that a Project Board and a National Steering Committee will be formed. These two bodies will both have representatives from DAE, FD, and LGED that are also engaged in the implementation of SPCR (See Annex 9 for the composition of these bodies). These bodies therefore will be used as a platform for sharing lessons within the Government. The LDCF project also envisages organizing a series of knowledge sharing workshops and events both at the national and local levels; of these those planned under Outputs 1.1 and 2.2 will be especially relevant to SPCR.

114. Another large-scale program in coastal areas, with relatively less emphasis on climate change adaptation than SPCR, is IFAD's Char Development Settlement Project (CDSP) Phase IV (2011-2017). Although this project also operates in coastal districts, their geographical focus area is remote offshore islands (mainly Nangulia Char, Noler Char, Caring Char, Char Ziauddin, and Urir Char, all in Noakhali district), and there is no geographical overlap with the LDCF target sites. However, as with the case with SPCR, the lessons learned from both projects will be shared continuously during the course of project implementation.

#### **4. Project Objective, Outcomes and Outputs & Proposed Activities**

115. The project objective is to: "Reduce vulnerability of communities to the adverse impacts of climate change through participative design, community-based management and diversification of afforestation and reforestation programmes." The project will achieve this objective by overcoming the barriers outlined in Section 1.5 and delivering the following three outcomes.

**Outcome 1:** Vulnerability of communities in new afforestation and reforestation sites reduced through diversified livelihood options and more effective greenbelts

**Outcome 2:** Strengthened community involvement in, and ownership of, forestry-based adaptation and climate risk reduction programmes

**Outcome 3:** Communal livelihood assets in afforestation and reforestation sites are protected from extreme climate events through effective early warning and preparedness planning

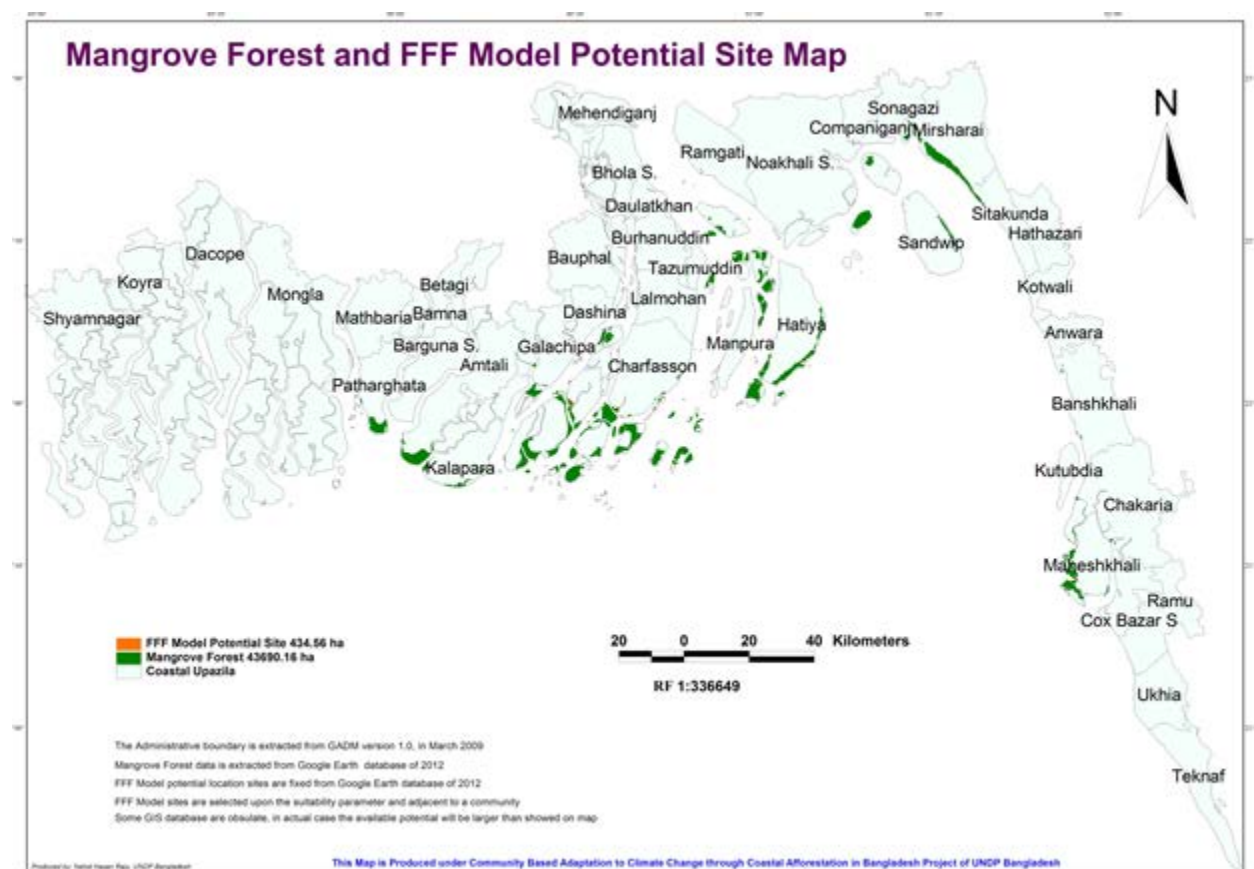
116. Barriers relating to the technical and financial capacity of the BFD for actual coastal afforestation and reforestation will be addressed through the CRPAR project. The LDCF project will focus on the other remaining barriers to effective coastal greenbelts (Section 1.5), working in close tandem with the CRPAR project to avoid duplication. The project also builds on the achievements and lessons learned to date by the LDCF-supported CBACC project.

117. The project will work in selected Upazilas in coastal districts where the new CRPAR project will be undertaking mangrove afforestation. However, MoEF/BFD decided early on to exclude Cox's Bazaar and Chittagong districts, where CRPAR project is also undertaking mangrove afforestation in order to focus LDCF-financed interventions along the more exposed coastal areas of other districts. Thus, the project will be working primarily in Noakhali, Patuakhali, Barguna and Bhola Districts, although additional Districts may be selected for certain project components. At least 7 Upazilas will be targeted under this project where the CRPAR project is undertaking mangrove afforestation (Table 4, Figure 5 and Annex 5). Additional Upazilas may be selected for the mangrove forest diversification trials under Output 1.2, as this component is not directly linked to CRPARP activities.

**Table 4 Proposed Project Districts & Upazilas**

	<b>District</b>	<b>Upazila</b>	<b>Basis for selection</b>
1	Noakhali	Hatiya	These districts & upazilas were selected through consultation with government officials associated with CRPAR project. Key selection criteria included ensuring alignment with CRPAR coastal mangrove afforestation sites and avoiding duplication of AF sites. Other considerations included, vulnerability of the local population, availability of land for different adaptation interventions including application of the Triple F model. Five of the selected Upazilas (namely Galachipa, Rangabali, Patharghata, Monpura and Char Fasson) were among the 11 worst hit upazilas in the recent cyclone Mahasen in 2013. The CBACC project is also working in Barguna, Bhola and Noakhali but the only overlap in Upazilas is in Hatiya. All other proposed Upazilas in this project are new sites.
2	Patuakhali	Galachipa Rangabali	
3	Barguna	Pathargata	
4	Bhola	Monpura, Char Fasson Tazimuddin	

**Figure 5: Distribution of mangrove forest Bangladesh and potential for propagating Fish-Fruit-Forest Model in coastal districts**



**OUTCOME 1** Vulnerability of communities in new afforestation and reforestation sites reduced through diversified livelihood options and more effective greenbelts

Co-financing amount for Outcome 1

GoB CRPAR project: \$ 33,000,000

USAID/CREL: \$ 2,000,000

Total co-financing: \$35,000,000

LDCF project grant requested: \$ 3,240,000

#### **Baseline:**

118. GoB has invested heavily in coastal afforestation and reforestation schemes since the 1960s primarily to reduce coastal vulnerability to climate hazards and associated impacts (Sections 1.3 & 2.3.2). However, the protective potential of these coastal greenbelts has not been fully realised due to plantation failure and encroachment (Section 1.3 & 1.5). Perceived economic and adaptive benefits derived from coastal mangrove forests are conventionally based on a short-term view that the greenbelts provide natural shelter against cyclones, in so far as they remain intact, rather than on a medium- to long-term view that integrates longevity and integrity of the ecosystem in the cost-benefit calculation. This is reinforced by the following additional factors: a) there are few incentives in place for local communities to maintain these



plantations once established; and b) there have been limited attempts to further diversify coastal plantations, which are initially planted with pioneer species such as Keora and Baen, once the newly accreted land has stabilized and inundation patterns have changed making it no longer possible for the pioneer species to regenerate in gaps created by pests or disease.

119. Despite these challenges, however, coastal greenbelts are still regarded as a key frontline strategy for reducing coastal vulnerability and their expansion through afforestation is among the country's 2005 and 2009 NAPA priorities. Thus, GoB is planning to establish 500m wide mangrove belts as a cost-effective method of protecting coastal embankments in front of sea-facing low-lying coastal lands.<sup>74</sup> To date, however, the planning and implementation of baseline afforestation and reforestation activities have been largely divorced from their local socio-economic context and thus lacked specific measures to counter anthropogenic pressures on the long-term sustainability of the coastal belts. Similarly, while numerous organizations and government agencies support a range of interventions to strengthen and diversify local livelihoods, these interventions generally take place in isolation from the establishment and maintenance of coastal greenbelts.

120. The level of understanding about ecological and socioeconomic benefits of diversified coastal plantations is increasing but still insufficient. In particular, the work of both BFRI and CBACC offers an important starting point in better understanding the appropriate mix of mangrove and non-mangrove trees depending on the salinity and inundation pattern of different areas (see Table 5 below). However, these results and impacts of these trials have not been captured, synthesized and made available in a systematic manner. For example, insights into different types and stream of benefits from forests of different ages and different management needs based on empirical trials are still limited.

**Table 5: Salinity zone & range tolerated by different mangrove species**

	<b>Saline Zones &amp; Salinity Range (ppt=parts per thousand)</b>	<b>Name of the selected species</b>
1.	Low (10 – 15 ppt.)	<i>Dalbergia sissoo</i> , <i>Acacia nilotica</i> , <i>Pithecellobium dulce</i> , <i>Acacia auriculiformis</i> , <i>Samanea saman</i> , <i>Albizia procera</i> , <i>Thespesia populnea</i> and <i>Terminalia arjuna</i>
2.	Moderate (up to 20 ppt.)	<i>Casuarina equisetifolia</i> , <i>P. dulce</i> , <i>Leucaena leucocephala</i> , <i>D. sissoo</i> , <i>A. procera</i> , <i>A. auriculiformis</i> , <i>T. arjuna</i> and <i>S. saman</i>
3.	Moderately High (up to 30 ppt.)	<i>L. leucocephala</i> , <i>T. populnea</i> , <i>C. equisetifolia</i> , <i>A. auriculiformis</i> , <i>S. saman</i> and <i>D. sissoo</i>
4.	Extremely High (above 30 ppt.)	<i>A. nilotica</i> , <i>C. equisetifolia</i> and <i>A. auriculiformis</i>

121. The recently approved BCCRF-financed Climate Resilient Participatory Afforestation & Reforestation project (CRPARP) is a new, large-scale government undertaking, which will be supporting amongst other things the establishment of over 5,700 ha of additional mangrove greenbelts along the coastline including over 5,000 ha in the most vulnerable coastal districts targeted by this project (Section 2.3.2). While the new forests will in theory provide “cost

<sup>74</sup> World Bank 2013. *CRPARP Project Appraisal Document*.



effective” natural buffers against future cyclones and storm surges<sup>75</sup>, in practice, the long-term cost-effectiveness of such greenbelts is questionable unless greater consideration is given to:

a) alternative and additional livelihood opportunities in order to reduce anthropogenic pressures on forests; and

b) more resilient planting practices to increase the diversity of these forests, thereby strengthening their resilience against pests and climate variability and thus their ability to sustain the necessary plant density per hectare to buffer and withstand the effects of rising water temperatures, water levels and salinity levels.

122. To achieve the long-term sustainability of coastal greenbelts, it is essential that these two factors are integrated into the design of large-scale coastal afforestation/reforestation programmes. Addressing a) and b) above are mutually-reinforcing – as seen in Table 2, alternative livelihoods and diversified mangrove forests offer two streams of incentives to local communities for better management of coastal mangrove forests as they go through different stages of maturity over time. However, in the CRPAR project, only 10% of budget is allocated for the alternative livelihoods development component and an even smaller fraction is expected to be allocated for testing more resilient planting practices such as enrichment plantation<sup>76</sup>.

123. The Arannayk Foundation (AF), which will implement the livelihoods component of the CRPAR project, plans to work in 200 villages in 9 coastal districts and to target 6,000 beneficiary households comprising around 25,000 individuals in areas where the CRPAR project is undertaking mangrove and other types of non-mangrove block plantations and strip plantations. AF will work only in areas where plantation size is at least 10ha or more. Specific options for livelihood diversification will be identified on the basis of site-based field assessments but are likely to involve schemes relating to animal husbandry, facilitating transport, etc. However, the livelihoods-based interventions under the CRPAR project will only target a very small proportion of the total vulnerable coastal population given that there are around 26.5 million people living in Bangladesh's 11 most exposed coastal districts, of which nine will be covered by this CRPAR project. Over 25% of the most exposed coastal people, or 7.6 million people, live in the active delta in the central region of the coast, comprising the districts of Bhola, Lakshmipur, Noakhali and parts of Patuakhali and Feni, and are especially at risk from climate-related impacts.<sup>77</sup> While the proportion of people living outside the embankment in these districts is not known precisely, this figure is also likely to be quite significant (Section 1.4).<sup>78</sup> In just Hatiya Upazila, Noakhali District alone, for example (one of this project's target upazilas), nearly 200,000 people, or 44% of the Upazila's total population of over 452,000, live outside the embankment.<sup>79</sup> Thus, the BFD considers that the target number of beneficiaries envisaged in the alternative livelihood component of the CRPAR project is too limited considering the overall number of vulnerable, natural resource-dependent households in the coastal region. This investment of 10% on Alternative Income Generation under the CRPAR

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<sup>75</sup> World Bank 2013. *CRPARP Project Appraisal Document*

<sup>76</sup> The exact volume of this activity is still unknown at this stage.

<sup>77</sup> S. Ahmad & K. de Wilde 2011. Setting the Stage. Chapter 1 In: K. de Wilde (ed). *Moving Coastlines: Emergence and Use of Land in the Ganges-Brahmaputra-Meghna Estuary*. The University Press Limited, Dhaka. p. 5

<sup>78</sup> There are no reliable statistics for the number of people living outside coastal embankments. However, based on knowledge obtained from the first LDCF CBACC project, it is estimated that the proportion of households living outside embankments varies between 10-45% of households in individual coastal Upazilas.

<sup>79</sup> Statistics Office, Upazila Parishad Hatiya, from 2011 Government Census Data

project will therefore not in itself be sufficient to generate adequate economic incentives for local communities to be willing to become responsible stewards of the coastal greenbelt.

### **Adaptation alternative:**

124. LDCF funding will be used to enhance the long-term sustainability and protective and economic value of major new baseline coastal afforestation and reforestation in four highly vulnerable central coastal districts of Bangladesh by complementing and expanding on activities undertaken under the CRPAR project. With LDCF support, alternative livelihood diversification strategies developed and tested by the CBACC project will be replicated and scaled up in new afforestation/reforestation sites in the CRPAR project. A key focus of this Outcome is to demonstrate synergetic benefits in an explicit manner from new coastal mangrove plantations, which act as natural shields to protect lives but also to protect and offer complementary livelihood sources (Outcome 2)<sup>80</sup>. LDCF funds will not be used to undertake any new plantation work, which will only be undertaken by the baseline project. Instead, these will be used to support approximately 10,500 households (corresponding to more than 40,000 individuals) in at least seven upazilas in these four districts to undertake a range of livelihood diversification measures, including new forms and combinations of agriculture, aquaculture, horticulture and animal husbandry depending on the specific context of individual households, including land and input availability and overall capacity.

125. Additionally, LDCF funds will be used to build on the work done by CBACC to date by undertaking mixed species diversification of existing coastal plantations of varying age in order to test strategies for both increasing the overall natural resilience of coastal plantations and understanding their potential to generate additional benefits for local communities, thereby creating additional incentives for communities to support their long-term maintenance. Moreover, LDCF support will be used to promote the systematic capture and synthesis of results generated by the diversification trials on the benefits that can be derived from different types of diversified plantations (i.e. in terms of species composition, structure and age) as well as on the management needs of these different plantation types. This will make a significant contribution to the somewhat sparse existing national body of knowledge on the nature and quantity of benefits that can be generated from different types of coastal mangrove plantations.

126. Thus, the LDCF-supported adaptation alternative encompasses strategies to strengthen the sustainability of the coastal greenbelt in the short to long-term. This is a significant departure from the underlying principle of the CRPAR project which makes limited explicit connection between livelihood support and responsibilities for better stewardship of coastal forests. Additionally, while the CRPAR project will be spending some resources on testing strategies for enhancing coastal forest resilience through enrichment planting, this is viewed solely as a measure to strengthen the natural resilience of these forests. Unlike the LDCF project, the CRPAR one does not envisage any potential direct benefit-sharing with local communities from coastal greenbelts as a result of greater species diversification.

127. Finally, the interventions planned under Outcome 1 have been designed to form part of an integrated suite of measures by complementing and supporting activities proposed under Outcomes 2 and 3. The livelihood diversification undertaken under Output 1.1 including any new

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<sup>80</sup> Due to the unavailability of the information of the specific locations of the BCCRF afforestation and livelihood assistance interventions at the time of the submission, a map visually indicating the synergetic benefits cannot be provided at this point in time (as indicated in the PIF). However, as soon as it becomes available, a map similar to Figure 5 above will be produced.

assets that are created will become better protected from climate risks through the activities undertaken under Outcome 3 on climate-proofing of communal assets. Similarly, the linking of livelihood support to better stewardship of new and existing coastal plantations will also be connected to activities undertaken under Outcome 2 to demonstrate strategies for increased benefit-sharing and co-management of coastal forests by local communities and government.

**Output 1.1** Community-based adaptation and livelihood diversification measures are integrated with baseline afforestation and reforestation activities in 4 districts

128. The MoEF will use LDCF resources to support a range of strategies to increase the resilience of local livelihoods around coastal afforestation and reforestation sites by targeting new livelihood strategies that are more climate resilient. As outlined in the preliminary beneficiary selection criteria (Annex 4), the focus of this sub-component will be on landless or land-poor households, whose livelihoods are currently limited to daily labour and natural-resource based activities such as fishing. Some interventions will be targeted at farmers with land rights and sharecroppers. Landless and land-poor households, who make up nearly 54% of the local population, will benefit through livelihood diversification strategies that either do not rely on having access to land, such as support for more resilient animal husbandry production processes, or through land-based strategies where the project has facilitated access to land as CBACC has done.

129. Activities under this Output will also support the development of individual capacity to identify and implement appropriate climate-resilient livelihood strategies. Thus, training will be provided on new animal husbandry techniques, cultivation of new crops, and adjusting cropping calendars and practices.

130. Additionally, provision of support for livelihood diversification will be linked to individual/community agreements to help protect the coastal greenbelts, which in turn protect the livelihood assets and increase the adaptive value of the plantations. This will be integrated into the process of selecting beneficiaries and incorporated into community-based monitoring under the new co-management mechanisms piloted under Outcome 2.

*Strategies targeting landless and land-poor households*

131. Pigeon farming and duck rearing have both been shown to be extremely suited to the coastal context as people can move these animals more easily to shelter during extreme weather events. These domestic birds are also not affected by salinity unlike chickens. They also require far fewer inputs to maintain and manage than larger domestic animals such as goats, sheep or cattle and can provide year round incomes unlike other sources of local livelihood.

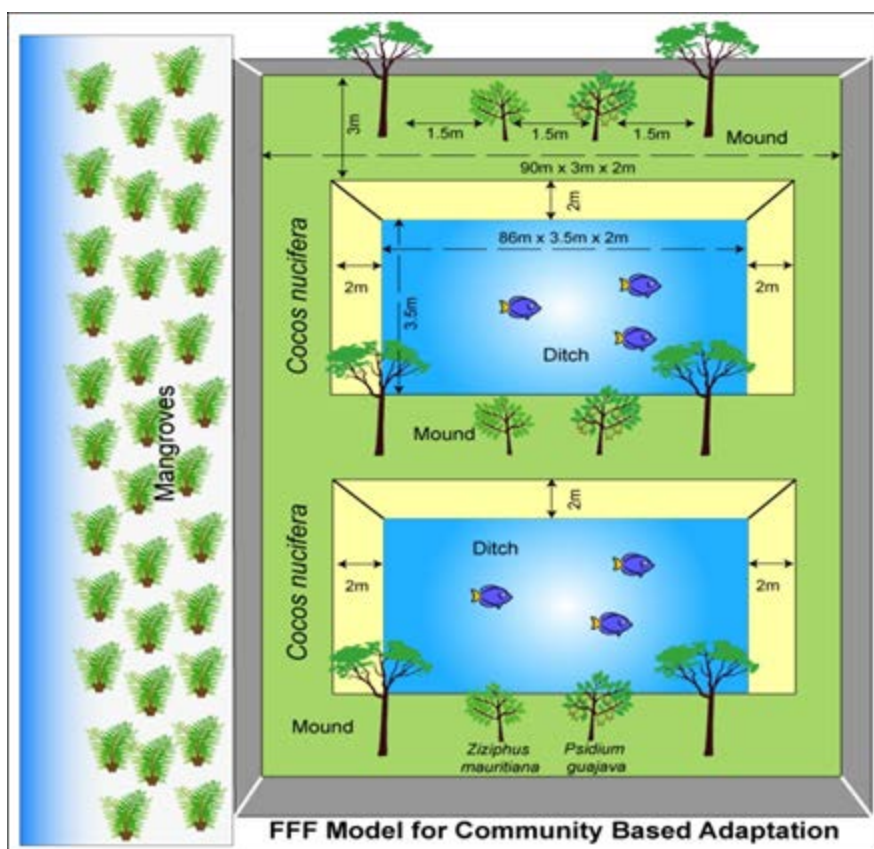
132. Those living closest to the sea (often fishers who also engage in some share-cropping) can also be provided support for mud crab culture, which can be an extremely lucrative source of income. This involves creating small ponds surrounded by small barriers in which wild baby crab spawn collected from estuaries is released and grown for 3-4 months until they reach a suitable size for sale to local markets. The ponds must be located near the sea as they need to be replenished regularly with saline water. While the market is relatively specialized – only non-Muslims in Bangladesh generally eat crabs for cultural reasons – there is very large demand for mud crabs from hotels and restaurants. Crabs can fetch BDT 400-500/kg and is also a year round activity.

133. Additionally, the project will also support the implementation of the Fish-Fruit-Forest (FFF) Model that has been trialled successfully under the CBACC project and shown to deliver multiple benefits to participating households, particularly for landless and land-poor households.

134. The FFF model combines a ditch and dyke approach to combining small plantations of mangrove and palm species (serving predominantly protective functions), interspersed with fruit trees (e.g. Bau Kul and Apple Guava) with aquaculture (serving predominantly economic and livelihood support functions) in the ditches or ponds. The dykes essentially comprise the long earthen mounds that surround each ditch. The top surface of the mounds provides an opportunity to grow trees and vegetables, which not only provide additional line of protection from sea surges, but also provide income sources from harvests. Aquaculture in the ditches sustains fish and duck production by local communities.

135. There have been some dramatic examples of increased crop and fish production and additional income arising from CBACC interventions using the FFF model. The Mid-Term Evaluation of the project in December 2011 documented the following achievements:

- Household income of Bangladesh Taka 20,000 (c. US\$250) from vegetable production
- A projected annual income of Taka 100,000 from vegetables and fruits on the better-managed dykes
- An increase from 25 kg to 100k fish from aquaculture in some ponds, generating up to Taka 12,000 per pond, with an average production of 140-150kg/year representing an income of c. US\$300 per pond per year.
- A six-fold increase in rice yields on salinated lands through use of salt-tolerant rice varieties reported by one farmer.
- 10-20kg fruit production/tree of Bau kul (*Ziziphus mauritania*) and Apple guava (*Psidium guajava*) after 2-3 years, representing an income of c. US\$700/mound.



**Figure 6: Graphical representation of community-based 'Fish, Fruit and Forest' (FFF) model**

Source: BFD & UNDP, 2010

136. In the case of CBACC, eight ditches and dykes were constructed in one hectare of land, with one ditch (pond) and dyke (mound) going to one household and the cost-effectiveness of the FFF model is well demonstrated: for the average cost of BDT235,000 or c. US\$3,000 for constructing one unit (i.e. comprising 8 ditches and dykes), beneficiaries from the CBACC project generally generated US\$1,000/family/year from the first year, i.e. US\$8,000/unit. This represents a more than doubling of annual income for the average landless or land-poor household (with <0.04 acres), which had annual incomes of US\$876 and US\$912, respectively, in 2010.<sup>81</sup> A large part of the construction costs is also used as wages for community labour thereby further benefiting local communities.

137. The FFF model thus has tremendous potential to improve the incomes and livelihood resilience of the very poor in coastal areas. However, its implementation is contingent on obtaining sufficient land, which can be challenging given the many competing demands on this very scarce resource. Thus, under this project, the MoEF/BFD proposes to reduce the unit size of the FFF model in order to increase the overall number of beneficiaries to 16 per ha or FFF unit of 8 dykes and ditches. While this may reduce the average income received per

<sup>81</sup> Bangladesh Bureau of Statistics. Household Income and Expenditure Survey 2010. Chapter 4. <http://www.bbs.gov.bd/webtestapplication/userfiles/image/HIES-10/Chapter-04.pdf>



participating household, it could still represent a 50% increase in average incomes with a greater number of people benefiting overall while doubling the number of beneficiaries.

138. Other livelihood diversification strategies that will be supported include apiculture and honey processing, seedbeds nursery, floating vegetable cultivation, cultivation and marketing of flowers.

*Strategies targeting households with access to land (i.e. sharecroppers & small landowners)*

139. Households with access to land will be given support to help them diversify their cropping strategies and cultivation practices, for example, through the introduction saline-tolerant rice varieties and new forms of inter-cropping. Rice remains the most important crop in Bangladesh, but there is need to increase local capacity and technical know-how to be able to identify and cultivate the most appropriate species given the impacts of climate variability and climate change as well as to adopt additional practices such as parallel rice and fish cultivation to take advantage of seasonal floodplain inundation. In a study by CGIAR in 2012 on environmental and climate-related factors driving changes in cultivation practices, higher salinity was mentioned by 25% of respondents as a key factor, and the emergence of new pests and diseases was cited by 21% of households.

140. The project will therefore build on the work of CBACC, which has trialled several salt-tolerant rice varieties and achieved a six-fold increase in rice yields on salinated lands in some areas, as well as promote the cultivation of fruit trees, which can generate considerable income. For example, both Bau kul (*Ziziphus mauritania*) and Apple guava (*Psidium guajava*) can generate an income of c. US\$700/mound from 10-20kg fruit production after 2-3 years growth.

141. Additionally, LDCF resources will be used to support the introduction of aquaculture species adapted to high temperatures and changed salinities and promote polyculture and fish-rice rotation in relevant areas as well as integrated water management for rice cultivation and brackish water aquaculture. For example, cultivating low-salt tolerant fish (e.g. Mono-sex telapia and carps) in mini ponds using rainwater was found to be profitable in several demonstrations. This water was also used to irrigate rice fields during the dry season under a share-cropping arrangement.

**Indicative Activities**

- Organize community meetings to link project support for livelihood diversification to explicit agreements on protecting coastal greenbelt
- Construct dykes and ditches (i.e. the Fish-Fruit-Forest model) using climate-resilient species and techniques adjacent to new greenbelt structures following the tested configurations under the CBACC
- Diversify livestock rearing options by introducing pigeon and duck farming
- Introduce small-scale crab farming in ponds and dyke structures adjacent to new greenbelts
- Diversify rice cultivation through introduction of salt-tolerant varieties and promoting fish-rice rotation
- Propagate aquaculture in dyke structures of mound-and-dyke plantations;
- Carry out face-to-face training, targeting land-poor and landless households, focusing on climate resilient alternative livelihood strategies (Year 1-3 targeting 10,500 households)
- Carry out an assessment to gauge the level of adherence to the agreed beneficiary selection criteria (in response to the Environmental and Social Screening Procedure – Annex 12)



- Organize at least two national and local level knowledge sharing workshop on the successful demonstrations of investments under this Output

**Output 1.2** Diversified trial plantations of up to 10 mangrove and non-mangrove varieties established in 4 districts to increase the adaptive capacity of greenbelt structures on accreted lands

142. Building on the work of BFRI and CBACC, LDCF resources will be used by the Forest Department to demonstrate the natural and adaptive benefits of mixed mangrove plantations in older monoculture/low-species diversity plantations that are degrading due to changed ecological conditions, susceptibility to pests and lack of natural succession and regeneration. These trial plantations, which will be implemented in 4 districts by the Forest Department, will demonstrate new and innovative mixes of tree varieties, regenerate gaps in existing monoculture greenbelts and increase the abilities of mangrove plantations to adapt to climate change-related pressures (salinity, inundation, temperature, wind). The project will target a total of 650 ha of plantations for species diversification over four years (with 12 different species), a significant increase from the 100 ha of trial carried out by BFRI/CBACC. Plantations at different stages of growth, but that are sufficiently stabilized (i.e. over at least 4-5 years old), will be targeted for diversification with indigenous species in order to also assess their potential to generate benefits for local communities. Specific sites will be confirmed during the project inception phase but will include a mixture of sites where CBACC has established plantations that are now around 4-5 years old and older plantations.

143. Based on BFRI's research findings, the following species, which have been found best suited for diversification of coastal greenbelts, will be planted in different combinations based on inundation regime and topography of forest floor:

- Sundari (*Heritiera fomes*)
- Gewa (*Excoecaria agallocha*)
- Passur (*Xylocarpus mekongensis*)
- Shingra (*Cynometra ramiflora*)
- Khalshi (*Aegiceras corniculatum*)
- Kankra (*Bruguiera gymnorrhiza*)
- Hanthal (*Phoenix paludosa*)
- Goran (*Ceriops dacandra*)
- Golpata (*Nypa fruticans*)

144. More concerted systematic efforts to undertake enrichment planting of older mangrove plantations offers an opportunity to introduce new tree varieties of greater direct economic value to local communities that can yield both short-term and longer-term NTFP benefits, such as fruits, tannin bark, thatch, honey and oil, bee wax, fish, prawn, crab, shrimp and lime<sup>82</sup>.

145. As under CBACC, local communities will be actively involved in the diversification trials, particularly in the establishment and tending of nurseries and subsequent planting and post-planting maintenance for at least three years. Actual plantation of new species generally begins only one year after the nurseries have been established in order to have sufficient saplings of the right age for planting. Women will be involved in all stages of mixed species diversification work.

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<sup>82</sup> Based on NTFP collected in Sundarbans. See for example, Singh, A., P. Bhattacharya, P. Vyas, & S. Roy. (2010). Contribution of NTFP in the livelihood of mangrove forest dwellers of Sundarban. *Journal of Human Ecology*. Vol: 29. Issue: 3. pp: 191

146. Lastly, LDCF resources will be used by the Forest Department to carry out an assessment of the types and timing of benefits that are generated from diversified coastal forests in different ages as well as management needs for such forests. Results from such an assessment will strengthen the existing knowledge body on coastal mangrove plantations, which will feed into the design of the benefit-sharing agreement envisaged under Outcome 2. The close partnership with CBACC project will enable that those diversified (model) plantations started in CBACC, that will be 5-9 years in age, to be also assessed. This presents an important opportunity for obtaining insights into different potential benefits from coastal forests with a wider range of maturity. In particular, the assessment will investigate the following aspects of diversified coastal forest plantations: a) the nature, quantity and timing of benefits that can be generated from different species associated with more diversified coastal mangrove greenbelts e.g. through NTFP collection; b) overall integrity and ecological condition of the forest compared to monoculture sites; c) the key parameters that determine mangrove forest integrity and ecosystem functions, including the generation of selected tangible NTFP benefits; d) management needs to maintain ecological integrity, strengthen natural resilience and the generation of a range of direct and indirect benefits to local communities; and e) any negative environmental/ecological impacts from the introduction of multiple species.

### **Indicative Activities**

- Confirm plantation sites and areas for mixed species trials and further assessments of the tangible benefits of coastal forest diversification
- Undertake seed collection (either from previously planted trees or from Sundarbans natural forest particularly *Nypa fruticans*) and pre-treatment of seeds before sowing and establish tree nurseries to raise seedlings of different species for planting
- Engage and train local communities in nursery management (watering, tending seedlings etc); prepare sites for plantation (weeding, site layout, etc);
- Maintain newly planted seedlings for at least 3 years.
- Develop and implement a monitoring plan for the systematic assessment of the impact of enrichment plantations in older plantations where some diversification has already been trialled, such as those under CBACC
- Analyse and synthesise key findings on options for strengthening natural resilience and economic value of coastal forest from systematic assessment of mixed species trials and diversified plantations for wider dissemination and replication.

**OUTCOME 2** Strengthened community involvement in, and ownership of, forestry-based adaptation and climate risk reduction programmes

Co-financing amount for Outcome 2

USAID/CREL:	\$ 8,000,000
Total co-financing:	\$ 8,000,000

LDCF project grant requested: \$ 640,000

**Baseline:**

147. Existing baseline forestry projects offer limited opportunities for community engagement in coastal forest establishment and maintenance. Historically, at the time of establishing the forest, community participation has been limited to employment as daily wage labour for tending nursery plantations, planting of mangrove seedlings and initial protection of the young seedlings (Section 1.5.2). Once the forest is established, community members are hardly engaged in the management of forest resources. Although forest product sharing options have been clarified through the Social Forestry Rules of 2004 & its 2010 amendment, actual benefit-sharing options envisaged in these rules are restricted to non-mangrove species and benefits accruing to communities from mangrove greenbelt forests are currently anyways limited due to both low species diversity and the limited economic potential of planted species to local communities and government concerns about their ability to ensure sustainable use (Section 1.5.2). Absence of a formal agreement in which local communities are given access to various tangible benefits generated by the coastal greenbelt forests over time, coupled with the limited roles they play in the management of the forests, results in an on-going incentive structure that drives some community members to exploit, rather than protect, forest resources.

148. Threats to coastal greenbelts arising from local activities are further compounded by weak inter-sectoral coordination on adaptation and disaster risk reduction, which limits potential synergies between different departments to strengthen local understanding of the adaptive significance of coastal greenbelts and to provide climate risk reduction measures in a more coordinated and effective fashion (Section 1.5.4). While a number of platforms for inter-sectoral cooperation already exist at District, Upazila and Union level such as the District Development and Coordination Committee and the Upazila and Union-level Development & Coordination Committees, these currently do not address local adaptation issues in an integrated manner. Key sectors that could potentially generate considerable adaptation gains by working more closely together would include BFD, which is tasked with coastal afforestation, BWDB, which is in charge of coastal embankments, including land up to 1 km either side of the embankment and the Department of Disaster Management (DDM), which has responsibility for disaster preparedness, relief and rehabilitation. However, at present there is no formal coordination between BFD, BWDB or DDM to explore potential synergies and complementarities, which could also generate cost-savings amongst other benefits.

149. The CBACC project is among the pioneer projects in Bangladesh to promote greater community participation and inter-sectoral coordination specifically in coastal forest management through the establishment of Co-Management Committees (CMC), which have been piloted in Bangladesh by earlier projects in the context of Protected Areas and inland aquatic resources with considerable success (Section 2.3.3 and below). In the case of CBACC, the CMCs are essentially formal sub-national dialogue platforms that serve to increase understanding among local government and community representatives about the adaptive role of coastal greenbelts as well as to share information on local adaptation needs and how these can be met more strategically. Membership of CBACC CMCs includes local government departments as well as civil society members and elected political representatives. Furthermore, CMCs are linked to the district-level through the project District Steering Committee. CMCs are therefore also an effective mechanism for not only promoting greater understanding of the value of coastal greenbelts, but also for strengthening community engagement and horizontal and vertical inter-sectoral coordination aimed at the improved management of coastal forests and other measures to increase local livelihood resilience. CBACC CMCs provide an important platform for information sharing and discussion, as well as helping to identify government services and schemes available to coastal communities to increase their adaptive capacity. Additionally, the CBACC project also promoted knowledge sharing programmes by arranging inter-district exposure visits for selected government officials across project sites. This in turn

has contributed to developing institutional understanding and motivation to replicate successful adaptation strategies that are being demonstrated by CBACC.

150. As noted earlier (Section 2.3.3), USAID too has supported several pioneering initiatives on co-management and natural resource benefit sharing in the context of wildlife Protected Areas (PAs) and inland aquatic systems through the work of the Nishorgo Support Project (NSP), the Management of Aquatic Ecosystems through Community Husbandry Project (MACH) Project and the Integrated Protected Area Co-management Project (IPAC).<sup>83</sup> These projects have generated a wealth of experience and lessons on community mobilization for natural resource management in Bangladesh, with a particular focus on PAs and biodiversity conservation. For example, IPAC has developed benefit-sharing schemes in PAs in which park entry fees are shared on a 50:50 basis between government and local communities. While the actual revenues generated are relatively small, this remains a significant achievement in terms of establishing a precedent as well as its coverage<sup>84</sup>. Additionally, USAID has also facilitated benefit-sharing schemes for Non-Timber Forest Products in relation to the Sunderbans National Park, which is currently in a draft form pending approval by the GoB.

151. A key lesson demonstrated by MACH and Nishorgo is that co-management (with representation of all stakeholders) is a more effective strategy for sustainable natural resource management than either a top-down, governmental approach or working only with Community-Based Organizations (CBOs), which are frequently powerless in the face of local elites and others. Interestingly, these projects were also successful in actively engaging women, who are of course major stakeholders in natural resource use and management, as they (along with children) are generally the primary collectors of fuel, fodder, construction materials such as bamboo, and water. The Nishorgo Support Project was even able to set up women's forest patrol groups. Thus, the recently launched Climate Resilient Ecosystems and Livelihoods Programme (CREL), the successor to these earlier USAID initiatives on co-management in Bangladesh (Section 2.3.3), continues to have a strong focus on the management and conservation of PAs and biodiversity through co-management, but with a growing emphasis on reducing people's vulnerability to climate change.

152. The experience of CBACC and USAID has shown the potential of CMCs and other village-level institutions to greatly strengthen community engagement and ownership of natural resources management as well as inter-sectoral cooperation through the CMCs and related institutions. However, despite the many positive experiences of these projects, there remains some reluctance within BFD to enter into co-management arrangements with local communities in relation to coastal forests for the reasons already discussed in Section 1.5.3. Thus although the new CRPAR project will be involving local communities to some extent in patrolling and participatory monitoring, there are currently no plans to develop or enter into co-management or benefit-sharing agreements with communities in relation to the new coastal mangrove plantations that will be established under the CRPAR project.<sup>85</sup> At the same time, under the existing design of CREL, there is no provision for exploring the co-management and benefit-sharing potential of coastal greenbelts. Thus, under the business-as-usual situation, there remains a significant lost opportunity for building resilience in coastal communities – an opportunity that would be realized through bringing the tested co-management and benefit-

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<sup>83</sup> USAID 2010. Bangladesh Environment Sector Assessment and Strategic Analysis: Final Report. Prosperity, Livelihoods and Conserving Ecosystems.

<sup>84</sup> This benefit-sharing agreement established through these projects now applies to all PAs in the country except Sundarbans.

<sup>85</sup> World Bank 2013. *CRPARP Project Appraisal Document*. Annex 8, p. 117/Paras 10

sharing approaches to the coastal setting and thus removing on-going anthropogenic threats that currently lead to the degradation and loss of the new plantations.

### **Adaptation alternative:**

153. Under Outcome 2, LDCF funds will be used to change the underlying incentive structure that currently drives coastal forest degradation and loss in Bangladesh. This will be achieved by three tightly integrated sets of activities that are further supported by activities undertaken under Outcomes 1 and 3 as follows. Under Output 2.1, the Implementing Partner will mobilize local communities in the project target upazilas to form at least 40 local Forest Resource Management Groups (FRMGs) at village/community-level and a Co-management Committee (CMC) in each target upazila. Each FRMG is expected to have 100-150 community members. Under Output 2.2, forest-benefit sharing schemes will be developed and piloted in different sites identified under Output 1.2 to demonstrate the types of benefit streams that can be generated from plantations. This would also include comparing benefits that can be derived from plantations with different species composition and at different stages of growth.

154. Based on the findings of these demonstrations (Output 1.2), a draft notification on forest product benefit-sharing for coastal mangrove plantations will be prepared. While the establishment of CMCs, FRMGs and benefit-sharing agreements will contribute to heightened awareness and greater joint community and institutional engagement on coastal plantations, this will likely not be enough to shift institutional attitudes to co-management and benefit-sharing in coastal plantations or to develop the skills and knowledge needed by government officials and local community representatives to implement such approaches effectively in the coastal zone. Thus, under Output 2.3, LDCF funds will also be used to support targeted awareness generation and capacity development of BFD and other relevant government stakeholders and of community representatives, including women, to enable them to negotiate and agree rights and responsibilities over coastal forest management and benefit-sharing and fulfil these. Output 2.3 focuses on delivering training and other activities to develop co-management capacity within local communities and key government actors in the project's target upazilas. Capacity development will be targeted at the Co-Management Committees (CMCs) and Forest Resource Management Groups (FRMGs) established under Output 2.1.

155. In delivering these Outputs, the project will build on CBACC's experiences of CMCs and forest diversification as well as USAID's vast experience on co-management and benefit-sharing in the context of wildlife PAs and inland aquatic systems. Consultations during the project preparatory phase revealed that USAID is interested in exploring the co-management potential of coastal greenbelts to realise their full adaptive potential. However, never having worked on co-management in the context of coastal greenbelts, which are quite different ecologically and institutionally from wildlife Protected Areas and more natural ecosystems, USAID would like to partner with the LDCF project to test and demonstrate co-management and coastal plantation benefit-sharing. A partnership between the LDCF project and USAID's CREL project will thus lead to many synergetic benefits for both projects through the exchange of ideas, knowledge and different experiences derived from working on comparable issues in very different institutional, environmental and policy contexts.

156. Thus, USAID co-financing will be used to provide technical guidance on the design and operation of CMCs and FRMGs under Output 2.1 as well as to provide selected elements of capacity development for CMC and FRMG members under Output 2.3. USAID will also provide their expertise to help design and evaluate forest-benefit sharing schemes as well as the draft national notification on coastal greenbelt benefit-sharing that will be developed under Output



2.2. CBACC's experience will also inform many activities under Outcome 2, particularly the establishment and operation of the CMCs to ensure that these also serve as useful inter-sectoral dialogue and coordination platforms.

157. The combined impact of LDCF's support for the implementation of the outputs under Outcomes 1 and 2 will be to bring about a fundamental shift in the local cost-benefit calculus in relation to coastal mangrove plantations as a result of complementing livelihood diversification with tangible benefits from forests and a greater role in their management.

**Output 2.1** Existing systems of participatory natural resource management applied to strengthen the climate resilience of coastal afforestation/reforestation programmes

158. The proposed project will leverage USAID's extensive experience on supporting co-management and benefit-sharing and also build on the more recent experiences of the CBACC project in this area and on strengthening inter-sectoral coordination to establish and implement two key mechanisms for greater engagement of communities in coastal plantation management and benefit-sharing, namely Co-Management Committees (CMCs) and village/community-level Forest Resource Management Groups (FRMGs). Based on experiences from USAID and CBACC, a two-tier institutional structure is proposed: a lower tier, the FRMGs at the village/community-level, focuses on empowering local communities to engage effectively on coastal forest management and benefit-sharing; and an upper tier, the CMCs at upazila level, to serve the functions of facilitating dialogue between local communities and local government on coastal forest co-management and benefit-sharing, linking livelihood diversification and improved stewardship of coastal forests and strengthening horizontal inter-sectoral dialogue and coordination at the Upazila level and above<sup>86</sup>. The membership, representation from various stakeholders, responsibilities of these groups, and ToRs will be finalized through a Government Order as have been done in the USAID initiatives.

159. Particular attention will be given to ensuring there is good participation of women both FRMGs and the CMCs as both USAID's and CBACC's experience show that there is good scope for empowering disadvantaged women through co-management by ensuring their involvement in such community-based institutions and by developing their actual capacity for co-management and taking on positions of responsibility for example by acting as representatives in the CMCs.

### Indicative Activities

- In consultation with MoEF and USAID, finalize the structure of the FRMGs and CMCs
- Mobilize local communities to form 40 FRMGs in sites targeted for forest-benefit sharing identified under 2.2
- Develop and agree rules for FRMG membership and operation, including decision-making processes, roles and responsibilities of members, engagement with CMCs, monitoring and reporting.

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<sup>86</sup> This structure, by and large, follows what was tested in USAID initiatives. For example, in the Forest PA Co-Management model adopted in Nishorgo, four different platforms were established at two-tiers: Co-management Council and Co-management Committee both at the Upazila level and People's Forum and Village Conservation Forum at the village/community level. The proposed two-tier structure in the LDCF project envisages combining the functions of these respective groups in the two tiers adopted in Nishorgo for simplicity. More details of the responsibilities of each of these bodies in Nishorgo are provided in Annex 6.



- Develop and agree local coastal forest stewardship plan with each individual FRMG.
- Organize trainings targeting all 40 FRMGs (Year 2-4)
- Support implementation of local coastal forest stewardship plan including monitoring, reporting of pre-agreed growth parameters and signs of encroachment and plantation gaps
- Support formation of CMCs in sites targeted for forest-benefit sharing identified under Output 2.2
- Organize trainings targeting all 7 CMCs (Year 1-4) on benefit-sharing agreement, inter-sectoral dialogues on the management of coastal greenbelts, and management needs.
- Develop and agree rules for CMC membership and operation, including decision-making processes, roles and responsibilities of members, engagement with FRMGs, engagement with upazila Disaster Management Committees and monitoring and reporting.
- Arrange regular meetings between FRMGs and CMCs, and report back to national level project technical working group established under Output 2.2
- Facilitate CMC participation in Disaster Management Committee meetings at upazila level
- Draft an official policy (e.g. a Government Order) detailing structure, functions (i.e. roles and responsibilities), decision-making and monitoring processes of FRMGs and CMCs for issuance to be adopted by the GoB during the course of implementation of the project

**Output 2.2** A forest product benefit sharing agreement between coastal communities and national government developed and adopted

160. Under Output 2.2, the Implementing Partner will develop and pilot benefit-sharing schemes in coastal plantations. This will be the first time where such an agreement, now widely accepted in Protected Areas in Bangladesh largely due to the efforts of the baseline USAID initiatives, is extended to cover coastal plantations. Development and adoption of a forest benefit-sharing agreement in coastal areas will be pivotal in altering the existing misaligned incentive structure and thus increasing the sense of stewardship over coastal forest resources. It is important to recognize that Output 1.2, which aims at establishing 650 ha of diversified (model) plantations, is a critical prerequisite for developing a benefit-sharing agreement arrangement envisaged under this Output since more meaningful streams of benefits can only be expected by artificially changing the composition of mangrove forests from single-species dominant ones to those with many varieties as discussed earlier.

161. As the types of benefits that accrue from coastal mangrove forests evolve as mangrove forests mature and as this is the first attempt for the GoB to extend such an agreement into mangrove forests, the process of developing such an agreement will inevitably need to be experimental. In the first half of the project implementation, the BFD will work with BFRI/CBACC to carry out a systematic assessment of the types and volume of benefits, predominantly restricted to NTFP, from diversified plantations in different age groups (an activity envisaged in Output 1.2). Subsequently, during the second half of the project implementation, the findings will feed into the design of an agreement that will be supported by a Government Notification.

162. A technical working group, at the national level, will be formed to guide and over-see the activities envisaged under this Output. This working group, represented by not only government agencies but research institutions such as BFRI and NGOs and development partners, will review findings from Output 1.2, draft a benefit-sharing agreement, and continuously monitor the demonstrations of the agreement until it is finalized in the Notification. As discussed in Output 2.1, discussions at FRMGs and CMCs will be shared with this group in order to ensure that the progress on sub-national inter-sectoral dialogues is shared with national-level stakeholders.

### **Indicative Activities**

- Establish a technical working group to develop a draft forest product benefit-sharing agreement for coastal plantations.
- Develop forest benefit-sharing agreements with individual FRMGs that specify details of benefits to be shared, when, where, how, etc and also define the roles and responsibilities of the different parties to the agreement.
- Test, monitor and evaluate forest benefit-sharing agreements in selected sites in terms of actual usage, type of benefits accrued, and any issues that are observed and need to be addressed.
- Analyze and synthesize results and lessons learned from demonstration forest benefit-sharing under this Output and from assessments conducted under Output 1.2 on mixed species diversification of coastal plantations.
- Facilitate broader policy discussions at subnational and national level on draft notification on forest product benefit-sharing in coastal plantations (Year 2-4).

### **Output 2.3**    Awareness and capacity of local communities and government staff to promote coastal greenbelt co-management and benefit sharing improved

163. The establishment and effective operation of both CMCs and FRMGs to implement co-management and forest benefit-sharing schemes will require considerable awareness generation and capacity development to meet the specific needs of different stakeholders. First, local communities and government officials will need to be made aware of the real benefits of engaging in these processes and mechanisms for which they will need greater exposure to the achievements of USAID, CBACC and others in this arena as well as a clearer understanding of the how coastal forests contribute to local resilience. Government officials will also need to overcome a long-standing institutional culture based on social hierarchies and a command and control approach to be able to effectively build trust with local communities. This in turn will require the right set of skills to know how to engage with poor, often illiterate people on an equal footing, ensure that they are able to hear the voices of the most vulnerable and prevent elite domination of community engagement processes and institutions. Similarly, poor, illiterate people often lack the confidence and other skills needed to engage effectively with government officials and others more powerful than themselves. Thus they will need different types of capacity development to be able to take responsibility for coastal forest management, including amongst other things, the ability to patrol forests, enforce rules to protect these, negotiate with different types of stakeholders, resolve conflicts and implement mechanisms that ensure equitable benefit-sharing.

164. Targeted capacity development programmes will be developed for FRMG members and CMC members to overcome existing gaps in capacity for effective co-management and benefit-sharing. Awareness generation and training programmes will be designed and delivered with technical support from USAID. Opportunities for peer-to-peer exchange and learning will also be promoted, for example, through exchange visits to former or existing USAID target sites.

165. Similarly, LDCF resources will be used to design an awareness campaign to rollout the benefit-sharing agreement demonstration that will be carried out under Output 2.2. Coastal communities, which have not seen such a benefit-sharing agreement earlier, will need to be sufficiently made aware to take advantage of such an opportunity. The materials and know-how amassed through the USAID's Nishorgo, MACH, IPAC and CREL initiatives will be fully leveraged for this purpose.

### **Indicative Activities**

- Conduct capacity needs assessment of FRMGs and CMCs.
- Develop and implement targeted awareness generation and training programmes for FRMGs and CMCs relevant to local coastal forest context including components on adaptive role of coastal forests, co-management and forest-benefit-sharing principles and mechanisms.
- Facilitate peer-to-peer exchange and learning between project FRMGs and CMCs and beneficiaries and other key stakeholders from USAID project sites where co-management and benefit-sharing have been successfully demonstrated.
- In consultation with USAID, design and produce awareness materials on a coastal forest benefit-sharing agreement

**OUTCOME 3** Communal livelihood assets in afforestation and reforestation sites are protected from extreme climate events through effective early warning and preparedness planning

Co-financing amount for Outcome 3

UNDP/CDMP: \$ 2,000,000

Total co-financing: \$ 2,000,000

LDCF project grant requested: \$ 1,500,000

#### **Baseline:**

166. While mangrove greenbelts are a vitally important adaptation measure for coastal areas, there will always remain a need for complementary measures to further protect human lives and livelihoods assets in the face of extreme climate events. The Cyclone Preparedness Programme (CPP) of the Ministry of Disaster Management and Relief (MoDMR) is one such major undertaking of the GoB that was started after a devastating cyclone in 1970. CPP aims to minimize human and material losses from cyclones. Over the last 43 years of its operation, CPP has established a system that includes a network of nearly 50,000 volunteers equipped with disaster warning/response gears and communication equipment in 37 coastal upazilas (in 12 districts). These networks help to further disseminate cyclone warnings issued by the Bangladesh Meteorological Department and are of critical importance in more remote areas, where people may not be easily reached through traditional means of issuing cyclone warnings such as the media.

167. Since 2006, the UNDP-supported Comprehensive Disaster Management Programme (CDMP) has also been working to promote a shift from disaster relief and response planning to a disaster prevention and risk reduction approach. CDMP began laying the foundations for institutionalizing this new, prevention-oriented paradigm for disaster management during its first phase (2003-09) by pilot testing potential approaches and frameworks and by working closely with the programme's host agency, MoDMR (formerly Ministry of Food & Disaster Management). CDMP is continuing this work in its second phase (2010-2014), which is currently under implementation. To date, CDMP has been especially successful in strengthening institutional early warning capacity. As a result of CDMP support, the Flood Forecasting and Warning Centre (FFWC) now has the technical ability to increase the lead time for its forecasts from three to five days. Similarly, with CDMP-II support, the Bangladesh Meteorological Department (BMD) has acquired enhanced computing capability and high-speed internet facility. BMD's Storm Surge Unit has also improved its technical capacity with CDMP support, resulting in faster download and analysis of satellite data in shorter period of time (down from 2 hours to 10 minutes).

168. Now, at the request of the GoB, CDMP is also helping to expand the CPP volunteer network to a further six upazilas that were not covered earlier by the CPP. While this will help to expand CPP's already impressive geographical and human coverage, program volunteers in general suffer from chronic shortages of essential basic equipment<sup>87</sup> for effective and rapid dissemination of early warning information as CDMP does not have the resources to fully cover this shortfall.<sup>88</sup> Moreover, the existing CPP training methodology, which CDMP will also be using, is currently offered on a one-off basis at the time of mobilizing volunteers and is centred on early response, such as first aid training and search and rescue, rather than institutionalizing disaster risk reduction principles. Similarly, CPP training currently does not provide conceptual or practical links between disaster risk reduction and the government's large-scale afforestation/reforestation programmes, although there is considerable overlap in the objectives of both programmes. In other words, there is currently a significant lost opportunity in terms of using the CPP initiative as an additional vehicle to also promote recognition of the role that coastal mangrove forests play in increasing local adaptive capacity and thereby strengthen community-based stewardship of such resources.

169. Apart from early warning systems, there are a number of other measures that are necessary to effectively protect human lives and livelihoods assets during extreme weather events such as additional coastal defences, adequate and accessible evacuation shelters that can accommodate both people and livestock, access to safe drinking water and effective drainage. Considerable efforts have been made to implement a range of such measures by GoB as well as NGOs, often with donor assistance. Earthen coastal embankments constitute one of the major and long-standing investments by GoB to protect coastal populations and their livelihood assets although their effectiveness varies due to shortcomings in their planning and budget (Section 1.5.4). SPCR is currently investing USD 25 million and additional proposed USD 300 million (in soft loans), through one of its three investment programmes, in strengthening embankments in 16 Upazilas, of which two falls under the target Upazila of this project. Historically, these were designed with a focus on preventing storm-induced flooding and tidal bores and thus their design has not taken into account the need for adequate drainage to prevent flooding and subsequent water-logging on the inside of the embankment. The latter has become a serious problem in some areas and is one of the most serious threats to livelihoods and livelihood assets in certain localities after extreme climate events. There has been growing recognition of the problem of localized flooding on the landward side of the embankment and as a result, efforts to improve drainage on the inside of embankments are being carried out in some problem areas, for example through excavation of silted irrigation canals or by making provisions for drainage when constructing new embankments. For example, the LDCF-supported CBACC project is working with BWDB to construct 13 km of new embankment with proper irrigation and drainage facilities to protect 6,000 households in Char Kukri Mukri, an island that experiences frequent flooding and waterlogging. With additional funding from the Dutch Government, CBACC is supporting drainage facilities along the entire length of the 13 km new embankment at a total cost of US\$290,000, including operation and maintenance for 5

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<sup>87</sup> In many parts of coastal areas, modern technology-based solutions such as a text-message based early warning system, which does exist in Bangladesh, do not work as mobile network coverage is often unavailable, and thus, the most viable option of early warning dissemination in these areas continues to be conventional radio/hand siren-based dissemination. During the project preparatory phase, the possibility of the use of a text message-based solution for early warning was explored as indicated in the PIF. However, for the reason cited above, it was concluded that it would be most cost-effective to strengthen the existing and long-standing CPP network.

<sup>88</sup> It is estimated that about half of the existing volunteer groups do not have functioning gears and communication equipment such as bicycles, first aid tools, flags, hand sirens, rescue tools, torch and transistor radios.

years or at a cost of approximately US\$22,000/km. CBACC is also supporting the construction of 6 km of the new embankment and providing irrigation facilities along the entire embankment at additional cost, again with financial support from the Dutch Government. However, such interventions to improve drainage on the landward side of the coastal embankment in problem areas are still relatively rare.

170. Particular strides have also been made by GoB in the provision of clean drinking water across the country. However, the problem of access to safe drinking water during floods remains widespread, which, combined with poor sanitation and inadequate drainage, serves to exacerbate mortality rates at such times, particularly among the most vulnerable such as children, the sick and the elderly. Thus, while mangrove forests may act as the first line of defence in preventing human and material losses, residual impacts from both extreme events and smaller scale, localized floods in particular, can have a major impact on local livelihoods and wellbeing through the loss and destruction of valuable assets. For example, communal water infrastructure in coastal areas such as open-wells with hand pumps are generally very basic, lacking concrete lining or a raised platform, which make them extremely susceptible to becoming both inaccessible and contaminated even during small-scale localized floods. Although there have been numerous initiatives by NGOs and Government to flood-proof water supplies by raising village wells and handpumps, this has not been done systematically across the coast and given the scale of the problem and the size of the coastal population, many villages still lack access to safe drinking water during times of flood. SPCR, through another investment project, is also investing approximately USD 90 million in climate resilient water supply, sanitation, drainage and flood protection infrastructure in the same 16 Upazilas. As discussed in Section 2.3.6., their primary target areas are inside coastal embankments.

171. Similarly, numerous cyclone shelters have been and continue to be constructed across the most vulnerable parts of Bangladesh. However, these are expensive to build and still do not cover the entire population leaving significant numbers of people and their livestock with nowhere to go during extreme weather events or localized floods, particularly in more remote or hard-to-reach areas along the coast. According to MoDMR, as of early 2012, the country had only some 3,000 cyclone shelters in 2012, when it actually needed 5,000.<sup>89</sup> Based on projections of population growth, it is estimated that some 7,000 shelters will be needed by 2025.<sup>90</sup> Given that the first priority is to save human lives, less importance has been given to ensuring adequate evacuation sites for livestock, although these are vital livelihood assets for many coastal people - so much so that many would rather risk their lives than move to an evacuation shelter if it means abandoning their livestock.<sup>91</sup> During Cyclone Sidr in 2007, and estimated one million livestock were lost. Such assets often represent an insurance for low-income household, something they can sell in times of crisis or when more capital is needed to finance a particular investment. Lack of adequate livestock shelters also renders women particularly vulnerable as they generally take responsibility for ensuring the safety of livestock. Despite the critical importance of protecting livestock assets, very few existing cyclone shelters have any provision for accommodating livestock as, understandably, GoB's priority continues to be on saving human lives first. Nonetheless, a small number of cyclone shelters are now being built with a separate floor for livestock and will be ready by 2014, although demand will still continue to outstrip supply. A potential solution that has been trialled by various NGOs and

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<sup>89</sup> <http://www.unisdr.org/archive/26009> Communication by Dr. Muhammad Abdur Razzaque, of the then Minister of Food and Disaster Management to the UN's Office for Disaster Risk Reduction (UNISDR) in March 2012 as reported by UNISDR.

<sup>90</sup> <http://www.irinnews.org/report/96555/bangladesh-cyclone-shelters-for-livestock-too>

<sup>91</sup> <http://www.irinnews.org/report/96555/bangladesh-cyclone-shelters-for-livestock-too>



others with donor assistance, including CDMP, is the construction of indigenous 'killas'. These are essentially raised earthen platforms, mounds or hillocks, or a form of low-cost shelter that allows people to safeguard their livestock during weather-related emergencies. Traditionally, killas were used as evacuation sites for cattle and even humans during tidal bores. Typically, killas have a base of 15-30m in width and are some 10-15m in height. The sea- or river-facing side of killas have a vertical wall to minimize the impact of tidal bore. There have been attempts to construct these next to cyclone shelters to further minimize risks to people by having to only travel to one place during an extreme weather event. There has also been some experimentation with design to enhance the functionality of these killas. For example, CDMP has constructed three killas, including one in Shahbajpur village of Char Kukri Mukri Union, which has included combining pond creation for fish culture with killa construction.

172. In conclusion, despite the major efforts of GoB, numerous donors, international and national NGOs, there are still some critical gaps in current disaster preparedness planning in the coastal zone as outlined above. These pose serious risks to the security of local livelihood assets. Unless these gaps are effectively addressed, the resilience gains that are obtained from Outcomes 1 and 2 are likely to be significantly undermined.

### **Adaptation alternative:**

173. LDCF funds will be used to contribute to GoB's efforts in securing livelihood assets in the 7 upazilas targeted by the project through two main strategies and inter-related sets of activities that complement and further strengthen the activities undertaken under Outcomes 1 and 2. First, the Implementing Partner will develop, with financial assistance from LDCF, the capacity and the long-term sustainability of CPP volunteer networks in the 7 target upazilas both by filling gaps in communication equipment and other gear needed for an effective early warning response but also equally importantly by supplementing the existing GoB/CDMP CPP training programme with an additional module on climate change, the adaptive benefits of coastal afforestation, and anticipatory disaster risk management. The new training module developed with LDCF support will amongst other things cover the adaptive benefits of maintaining and strengthening coastal mangrove forests thereby making the link between forests and climate and disaster risk reduction more explicit. Moreover project beneficiaries will also be encouraged through the Forest Resource Management Groups, formed under Output 2.1, to become part of the CPP volunteer network and participate in these trainings and to thus play a more active role in protecting their lives and livelihood assets as well as in promoting improved stewardship of coastal forests. To facilitate this process, beneficiary selection criteria for the LDCF project (Annex 4) will be adapted to include CPP selection criteria. By doing so, the project will ensure that all communities engaging in project-related livelihood diversification actions are more systematically connected to the CPP early warning system.

174. Additionally, the Co-Management Committees (CMCs) formed under Output 2.1 (building on CBACC and USAID's CREL) will be formally linked with the upazila-level Disaster Management Committees (DMCs) and thus the CPP in each upazila. This will include representation of CMCs on the DMCs. Linking these two institutions will serve to further strengthen synergies between different components of the LDCF-project and increase the project's ability to demonstrate integrated solutions for strengthening coastal adaptive capacity. LDCF-funds will also be used to leverage CPP's vast network, which currently includes nearly 50,000 volunteers working in 12 coastal districts, to promote greater awareness about the relationship between better management of coastal forests and reduced disaster risks as well as any other potential benefits that are developed under Outcome 2.



175. In addition to strengthening and expanding the scope of the current CPP early warning system, LDCF-funds will also be used to provide three concrete sets of measures to address the gaps outlined above and increase the resilience of local livelihoods to extreme climate events in seven target upazilas. This will include interventions to climate-proof a selected number of village wells and handpumps (through concrete-lining or raising the platform), provide killas, in strategic locations near existing cyclone shelters, and improve drainage across the embankment in areas that are particularly prone to localized flooding within the 7 target upazilas. It is expected that this will cover at least 25 km of embankment in target upazilas. This will not only address the problem of localized flooding, but also strengthen the overall effectiveness of the coastal embankment, which remain a vital second line of defense against extreme weather events.

176. Together, these LDCF-supported interventions on strengthening the CPP volunteers capacity and protecting key livelihood assets will complement and strengthen on-going baseline interventions on disaster preparedness planning as well as securing LDCF-investments made under Outcomes 1 and 2, not only by securing vital livelihood assets such as freshwater, livestock and irrigation channels, but also by generating a range of health benefits from reducing the risk of water contamination and stagnation.

**Output 3.1** Strengthened CPP network capacity for effective early warning communications for extreme climate events in coastal afforestation sites

177. Complementary to the adaptive investments facilitated under Outcome 1, LDCF resources will be used under this Output to strengthen the capacity of the existing CPP volunteer network and ensure regular dissemination of early warning information in project target sites. To this end, CDMP and the proposed project will work in close partnership and align baseline activities and additional support required to achieve greater improvement in the capacity of the CPP volunteer network.

178. Out of the seven coastal Upazilas in which this LDCF project is proposing to work, CPP volunteer networks exist in six Upazilas with the total number of volunteers amounting to over 10,000 (see Table 6 below).

**Table 6: Proposed or actual numbers of volunteers in the target Upazilas of the new LDCF-supported project**

LDCF2 Target Upazilas	CPP network	No of volunteers		
		Male	Female	Total
Hatiya	YES	1440	720	2160
Monpura	YES	430	215	645
Tazumuddin	YES	730	365	1095
Char Fasson	YES	1500	750	2250
Galachipa	YES	1880	940	2820
Patharghata	YES	930	465	1395
Rangabali	NO	N/A	N/A	N/A

179. During the consultation with the UNDP-supported CDMP, it was recognized that the current training modality, in which training is provided only at the outset of volunteer

mobilization, is a major risk to the sustainability and effectiveness of the CPP networks. One of the fundamental premises for building disaster preparedness is the availability of repeated trainings and awareness raising at regular intervals; without these, the full potential of the extensive network of CPP volunteers will remain underutilized. For this reason, the CDMP has agreed to provide follow-up refresher trainings and mockdrills in the six LDCF-targeted upazilas as a baseline activity. LDCF resources will be invested in designing and integrating an additional training component on climate change, the adaptive benefits of coastal afforestation, and anticipatory disaster risk management into the existing CPP/CDMP training programme. In addition, LDCF funding will deliver basic communication equipment and gears to ensure that critical early warning information is delivered to the most remote pockets of coastal areas.

180. The standard training envisaged in CPP/CDMP, as a baseline development activity, is as follows:

1. Training of Trainers (ToT) of CPP officers
2. Volunteers training
3. Basic training
4. First aid training
5. Search and rescue training
6. Leadership training
7. Wireless operating and maintenance training

181. During the project implementation, a series of refresher trainings mainly targeting volunteer leaders (i.e. through ToT workshops) will be provided by CDMP (as a baseline activity). Using this as a delivery vehicle, additional components focusing on climate change adaptation, as presented above will be delivered. Application of the standard training modules by CDMP (with the CC module financed by LDCF) in Rangabali Upazila where the CPP does not currently operate is under discussion.

182. It is important to note that in stakeholder consultations during the design phase of this LDCF proposal, it was recognized that a more explicit link is needed between the Forest Resource Management Groups (FRMGs) that will be established under Outcome 2 and CPP volunteers as mutually reinforcing benefits can easily be expected through such linking, most importantly the heightened awareness about the need to protect coastal greenbelts to reduce potential impacts from natural disasters. Hence, selected members of FRMGs, especially women, will be encouraged to join the CPP volunteers. To facilitate this, during the project inception phase, the beneficiary selection criteria developed by AF (for livelihood support activities in CRPAR project, which the proposed LDCF project will also use) and the criteria for CPP membership will be reviewed and consolidated.

183. Lastly, the CPP has a series of public awareness activities, which include: 1) mock cyclone drills and demonstrations; 2) posters/leaflets/folk songs; 3) documentary preparation; and 4) preparation of booklets on CPP activities. These have proved very effective in raising awareness about the Programme and its activities. These existing materials will be used as an important baseline and LDCF resources will strengthen the baseline by including additional elements of climate resilience in coastal areas. Given the vast network of the CPP, currently covering 37 coastal upazilas in 12 districts with nearly 50,000 volunteers, successful integration of climate change awareness into the CPP awareness raising activities in seven LDCF-target upazilas, especially promoted awareness about the nexus between better management of coastal forests and reduced disaster risks, will see a tremendous opportunity for greater geographical coverage.

### Indicative Activities

- Review the beneficiary selection criteria, jointly with CRPAR project/AF and CDMP, and finalize the combined criteria for Forest Resource Group and CPP volunteer membership
- Design the climate change adaptation and coastal forest components of awareness raising activities to be integrated into the CPP, including the face-to-face training and awareness materials
- Finalize an agreement with CDMP-II on the specific locations and target groups of the training programs
- Finalize an agreement with CDMP-II and MoDMR about the expansion plan into Rangabali upazila.
- Identify and procure gears and communication equipment
- Carry out a quantitative assessment during mock drills to obtain the level of outreach of early warning information

**Output 3.2** Communal livelihood assets in new afforestation and reforestation sites are protected from extreme climate events through dedicated disaster preparedness and risk reduction measures

184. LDCF resources will be invested in community-based interventions aimed at mitigating the impact of climate-induced extreme events in the project sites through measures designed to protect key livelihoods assets. Consistent with the principle that is maintained throughout the other Outcomes, the interventions under this Output will be carried out in close vicinity to afforestation/reforestation sites and resilient livelihood support intervention sites. Three sets of interventions will be supported under this output: a) climate-proofing critical communal water sources; b) construction of 'killas' or low-cost livestock shelters in strategic locations near cyclone shelters where these are currently do not exist; and c) improving drainage in areas prone to flooding and water logging on the landward side of the coastal embankment.

185. Typically, climate-proofing communal freshwater supply will involve elevating village wells and hand pumps and if possible providing a concrete lining to minimize contamination risks and render water points more accessible during floods. Typically such platforms are designed to be at least two feet above the height of the highest recorded flood level in a given area. In some instances platforms may be up to 4-6 feet above ground level.

186. Construction of killas will follow the design used by CDMP-II (Annex 7) in the first instance, although opportunities for further modifying and adapting to suit local needs or enhance sustainability will also be explored. In addition to proximity to existing functional cyclone shelters, killas will be constructed in target upazilas where need is greatest – i.e. where there are large numbers of livestock, although safeguards will also be in place to ensure that livestock owners are among the poor and vulnerable to avoid elite capture of this particular intervention.

187. Drainage improvement will be conducted along some 25 km of embankment in selected target Upazilas that have particular problems with localized flooding on the landward side of the embankment. This will involve excavation of irrigation channels and construction of drainage channels so that water can drain out of the embanked area more easily. In planning this particular aspect of work, the project will build on the practical experience of CBACC and others who have been supporting comparable work along the embankment, notably the Dutch Government and the World Bank, who are both investing in improving irrigation and drainage on

the landward side of the embankment. Local communities will be engaged for the actual work and thus benefit from an LDCF-financed cash-for-work opportunity.

### Indicative Activities

- Confirm sites identified during preparatory phase for climate-proofing freshwater wells and handpump, new killas and improved drainage are strategic and practical in terms of numbers of vulnerable people who will benefit, land availability and distance from cyclone shelter in the case of killas, and severity of localized flooding in the case of drainage improvement.
- Climate-proof 150 freshwater wells and handpumps (concrete-lining and/or raising the platform) in at least four upazilas where there is particularly high need for this including Golachipa, Patharghata and Rangabali.
- Construct 10 killas in two upazilas close to cyclone shelters
- Improve drainage along 25 km of the embankment in total, distributed between selected areas prone to localized flooding in Monpura upazila

## 5. Key indicators, risks and assumptions

### Indicators

188. The main indicators of project success at the Objective and Outcome level are summarized in the Project Results Framework in Section 3, along with indicator baselines, targets, means of verification, risks and assumptions. These have been derived from UNDP's "Monitoring and Evaluation Framework for Climate Change Adaptation", and are aligned also with the LDCF Adaptation Monitoring and Assessment Tool (AMAT).

189. At the level of the Project Objective, which is to "*Reduce vulnerability of communities to the adverse impacts of climate change through participative design, community-based management and diversification of afforestation and reforestation programmes*", the indicators are as follows:

- Differential survival rate of new coastal mangrove plantations with and without associated integrated livelihood diversification support
- % of community members (gender disaggregated) who feel 'ownership' of coastal mangrove forest resources measured through change in score obtained through simplified adaptation of Knowledge, Attitude & Practices (KAP) survey method

190. At the level of the three Project Outcomes, the indicators are as follows:

**Outcome 1:** Vulnerability of communities in new afforestation and reforestation sites reduced through diversified livelihood options and more effective greenbelts

**Indicators:** % of targeted households that have adopted resilient livelihoods under existing and projected climate change [AMAT 1.3.1.1]

**Outcome 2:** Strengthened community involvement in, and ownership of, forestry-based adaptation and climate risk reduction programmes

**Indicators:** Regulatory reform and fiscal incentive structures introduced that incorporate climate change risk management [AMAT 1.1.1.3]

Number of Forest Resource Management Group members (gender-disaggregated) who gain access to coastal forest resources underpinned by a formal benefit-sharing agreement

**Outcome 3:** Communal livelihood assets in afforestation and reforestation sites are protected from extreme climate events through effective early warning and preparedness planning

**Indicators:** The number of CPP volunteers trained for climate risks, disaster preparedness, and the benefits of coastal forests for climate risk mitigation

The number and types of communal livelihood assets safeguarded from the potential impacts of extreme and localized climate events

## Risks

191. In line with UNDP project risk management practices a Risk Log has been prepared that provides information on project risks and proposed mitigation measures (see Annex 8).

## 6. Cost-effectiveness

192. Several alternative options for achieving the intended Project Objective and Outcomes were considered before finalizing the proposed Project Strategy. These included the following:

- a) Relocation was considered and immediately ruled out given Bangladesh's high coastal population density and acute land shortages.
- b) Hard infrastructure to protect lives and livelihoods such as coastal embankments. This option was deemed less cost effective for a number of reasons. As described earlier under Outcome 3 (Section 2.4) building 1 km of embankment with proper drainage facilities costs approximately \$230,000/km. In other words, building protective coastal embankment infrastructure in seven upazilas in four districts would cost many times more than the entire budget for this project. Indeed, at this cost, the project budget would only stretch to cover 24 km of new embankment. Furthermore, as seen earlier, embankments alone are unlikely to provide sufficient protection to vulnerable communities in coastal Bangladesh due to the country's highly dynamic coastlines that result in land accretion on the seaward side of embankments, prompting many to move to these highly exposed areas due to acute land shortage and other socioeconomic pressures.
- c) The third alternative that was considered was to continue with the status quo, i.e. rely on coastal greenbelts and existing embankments for protection against extreme climate events. This option offers a combination of both 'hard' and 'soft', or rather natural, infrastructure that enables the GoB to protect communities outside embankments with greater flexibility. However, the last 50 years of the GoB's experience in extensive afforestation and reforestation programs have amply demonstrated the deep-rooted difficulties of relying solely on this approach. Most importantly, this approach fails to sufficiently address the many underlying causes of vulnerability among coastal communities and the drivers of coastal deforestation. Unless such drivers are addressed as an integral element of ongoing afforestation/reforestation programmes, the natural coastal greenbelt

will continue to lose its integrity and effectiveness as a natural protective buffer.

193. After considering these alternatives to achieve the same objective, it was concluded that the approach proposed in this proposal is most cost-effective as it leverages major on-going baseline investments on coastal afforestation, community participation in natural resource management and community-based early warning systems to deliver a more integrated, effective and sustainable solution to coastal adaptation in Bangladesh. The project thus involves a carefully planned mix of 'soft' and low-cost infrastructural solutions to managing climate risks that are complementary to each other and to the existing baseline. 'Soft' interventions include targeted capacity development to increase local livelihood resilience and stewardship of local forests; building new synergies between key actors in the coastal zone to promote more strategic and efficient use of resources, and changing the local incentive structure that currently contributes to coastal forest degradation. Livelihood diversification, low-cost infrastructural investments and expanded early warning systems for extreme weather events, which will strengthen local resilience, have each been explicitly linked to improved stewardship of local coastal forests, which will further increase local adaptive capacity.

194. A major difference between the proposed approach and alternative approaches is that the project's strong emphasis on capacity development and empowerment of vulnerable communities through multiple strategies that will be far more effective in terms of increasing overall adaptive capacity in the long run rather than relying solely on hard or soft infrastructural solutions. Additionally, the close relationship with the LDCF-funded CBACC and the project's strategic partnerships with CRPAR project, USAID and CDMP is already generating numerous synergies that are likely to continue through the course of project implementation and contribute further to the cost-effectiveness of the proposed project approach. For example, the natural infrastructure established by CBACC, i.e. the new areas of afforestation and the diversified plantations, as well as the relationship established with BFRI (and other key partners) will directly benefit activities undertaken in this project under Outputs 1.2 and 2.2 in particular and reduce the time spent in searching for appropriate sites and building new relationships. Similarly, CDMP's agreement to conduct follow-up trainings to CPP volunteers, not only enhances the baseline capacity of the volunteers (which tends to be weak with just one one-off training) but also presents an important delivery vehicle for project to link disaster preparedness with the coastal greenbelts more tangibly and explicitly under Output 3.1. These synergies are being realised because UNDP is supporting both projects and sees value in doing this. The project will also build on existing capacity development approaches and materials developed by USAID to deliver Output 2.3 in particular, while both CRPAR project and CDMP-II beneficiary selection criteria will form the basis for beneficiary selection in this project.

## **7. Sustainability**

195. An important principle for ensuring sustainability of project results rests on the ownership of the project by the GoB. The fact that the GoB decided to use LDCF resources on a single priority in two consecutive projects, rather than spreading out limited resources thinly over many priorities, demonstrates the urgency of the issue as well as the commitment and ownership of the GoB.

196. Experience from CBACC indicates promising signs of ownership by the GoB and take-up for wider replication. For example, a salt-tolerant rice variety (BR47) was disseminated, as part of a CBACC's resilient livelihood pilot, in Naltona Union Parishad in Barguna district. Convinced by the successful results from the pilot, the district Department of Agriculture



Extension extended its support, with the public fund, to more than 1,000 ha of agricultural land, from the 38 ha that was piloted through CBACC.

197. Such voluntary take-up was greatly facilitated by CBACC's continuous efforts in using publicity materials for awareness raising, sharing of lessons and know-hows. It has produced to date 11 training manuals, a number of brochures and posters, newspaper and peer-reviewed articles and documentary films<sup>92</sup>. The MoEF is acutely aware that such efforts in raising publicity of the project domestically and internationally are a prerequisite for enhancing the ownership and sustainability of results, and will continue in the proposed LDCF project.

198. The project's strategic alignment with the CRPAR afforestation/reforestation project and the USAID CREL programme offer an important channel through which experience from the project will be shared in greater geographical coverage. In addition to the dissemination of lessons, the MoEF has designed the project with the following considerations to enhance institutional, financial, social and environmental sustainability of the LDCF investment as well as promoting wider replication and scale-up of effective strategies demonstrated with LDCF support.

### **Institutional Sustainability**

199. Capacity building of government and non-government institution is an integral element of the proposed project and critical for sustainability. It envisages enhancing the capacity of, inter alia, two institutions. First, MoEF and BFD as the Implementing Partner and a Responsible Party for Outcome 1, respectively, will be exposed to a new regime of coastal mangrove afforestation/reforestation. Implementation of Outcome 1 will provide an opportunity for sub-national level forest officers to observe, first hand, the impact of diversifying livelihood options in coastal areas. Based on the experience from the CBACC project, the economic impacts from livelihood diversification strategy employed in the project are likely to manifest as early as Year 1. This will be complemented by targeted training, under Output 2.3, for enhancing understanding about forest benefits and benefit-sharing agreement. Along with the work under Output 2.1 which facilitates more dialogue among coastal communities and forest officers, among other government agencies, this in essence means a fundamental shift in the way in which these officers will work with coastal communities, from a source of labour at the time of plantation to a partner that continues throughout the management of forest resources. Second institutions whose capacities will be enhanced are community-based organizations such as Forest Resource Management Group, Co-Management Committees and CPP volunteers. Through the work of CBACC and USAID's initiatives, these CBOs have been proven effective in utilizing the network of the poor and vulnerable for improved natural resource management while at the same time empowering them. Capacity building, awareness raising and legally recognizing their roles and responsibility, all of which will be supported in this project, are a prerequisite for ensuring that these groups will be sustained beyond the timeframe of the project.

### **Financial Sustainability**

200. Financial sustainability is one of the key principles that underlies the design of this project. The business-as-usual mangrove afforestation/reforestation approach adopted by the GoB in the last 50 years has demonstrated the constant repetition of reforestation and forest

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<sup>92</sup> See UNDP ALM (<http://www.undp-alm.org/projects/lcdf-cba-bangladesh>) and project website (<http://www.cbacc-coastalaffor.org.bd/>) for a list of such materials.

loss followed by yet another reforestation, and significant amount of public resources have been devoted to this activity. This repetition is primarily due to the fundamental oversight in the past afforestation/reforestation programmes to address critical drivers of mangrove forest loss, which include lack of alternative livelihood options for poor and vulnerable coastal communities and predominant focus on monoculture-driven afforestation/reforestation. Unless these drivers are addressed while plantation efforts are carried out, it is highly likely that the GoB continues to incur significant amount of resources on its difficult quest to establish a greenbelt structure in coastal areas. Activities and some policy changes envisaged through the implementation of this project will alter and improve the financial sustainability of such efforts. In particular, livelihood diversification support, complemented by a change in policy that governs the ways of benefit sharing from mangrove forests, will ultimately transform local communities from a threat to a steward of mangrove forests. Furthermore, linking of forest resource management CSOs with disaster management committees, supplemented by a series of trainings and awareness-raising workshops, will contribute to instilling the perception among communities that mangrove forests act as a critical natural defence, which will also facilitate the transformation. The three interrelated components of this project, when implemented in a complementary manner, will nurture a conducive environment for a better community management and greater longevity of mangrove resources.

### **Social Sustainability**

201. Social sustainability will be achieved as a result of the project's emphasis on empowerment of the poorest and the most vulnerable, especially women, living in coastal areas, and recognition of these groups as a partner for better management of mangrove forests for enhanced climate resilience. To date, these groups have generally been engaged only as a one-off labour force and perceived as a threat for coastal greenbelts because of their encroachment into mangrove forests. This is a reflection of the disadvantaged societal position that they are in: as discussed earlier, their encroachment to mangrove forests is often driven by powerful local elites or by their dire needs to make their living. Their social position also renders them more vulnerable than any other groups in society to natural disasters. Increasing risks of natural disasters due to climate change reinforces the existing pattern of inequality in coastal areas and increases the potential for social instability. As discussed above, the proposed project, through interlinked activities on livelihood diversification strategies, establishing and strengthening of CBOs, and policy change to promote benefit-sharing, will all contribute to empowerment of these disadvantaged groups, which is a necessary condition for attaining social sustainability of project results.

### **Environmental Sustainability**

202. By enhancing the natural resilience and long-term sustainability of the coastal greenbelt through improved management, diversification and more sustainable use, the project will contribute greatly to increasing local environmental sustainability. More heterogenous forests are generally ecologically more stable, have greater natural resilience and also greater potential to generate a wider range and volume of ecosystem services.

## **8. Replicability**

203. Strategies for further scale up and replication of successful project interventions to increase local adaptive capacity are embedded within the project design and the strategic partnerships that have been established to support and complement the LDCF project. First, the

project will ensure that a practical and useful M&E system is in place to ensure that project strategies and results are systematically recorded and evaluated for lessons learning and wider sharing of successful strategies to promote their uptake and replication. Additionally, systematic monitoring of performance, cost-effectiveness and other management parameters will also provide useful inputs for adapting project approaches as well as for future replication.

204. Second, coastal greenbelts are integral to GoB's adaptation strategy and forestry policy for the coastal zone and there is long-term commitment by GoB, including MoL and MoEF to continue afforesting and reforesting newly accreted lands. The close involvement of government agencies and other organizations increases the potential for future incorporation of successful project approaches into the mainstream work of these sectors as well as promoting greater intersectoral cooperation on adaptation initiatives in the coastal zone.

205. Finally, the project's close alignment with CRPAR Project, USAID and CDMP-II, ensures further opportunities for scale-up and replication through the greater geographic reach of these partners. For example, the AF will be conducting alternative income generation activities under the CRPAR project in different sites from the LDCF project, offering opportunities for replication of successful project strategies in their sites. CDMP-II's network of some 50,000 community volunteers also offers enormous potential for disseminating project results and promoting scale up and replication.

## **9. Stakeholder involvement plan**

206. See Annex 3.

## **10. Compliance with UNDP and GEF environmental and social safeguards**

207. The LDCF-financed project makes a conscious effort in identifying and managing environmental and social risks that could be associated with the proposed project. In this regard, the UNDP Environmental and Social Screening Procedure, which is aligned with the Framework for Advancing Environmental and Social Sustainability in the UN System and with the UNDAF Guideline, was carried out in partnership with the project proponent – the Ministry of Environment and Forest. The result of the Procedure is included in Annex 12.

208. The screening process has identified, in particular, the following potential social and environmental risks and impacts:

### **Social risks and impacts**

209. Output 2.1 envisages establishing Forest Resource Management Groups at village/community level and Co-Management Committees at the Upazila level. The former offers an avenue for poor and vulnerable community members to express their needs in terms of coastal forest resource use and provides a platform to form a group that will be responsible for management of such resources. The latter, on the other hand, will provide a formal platform to representatives from these communities to engage in dialogue with sub-national government departments as an equal partner for management of coastal forest resources. It is envisaged that both FRMGs and CMCs will be formally recognized by the GoB through a Government

Order. The aim is, based on tested experience from the CBACC project and USAID's initiatives (Nishorgo, MACH, IPAC and CREL) to provide sufficient bargaining power and formal recognition to the communities that are currently practically voiceless in the negotiation and planning of coastal forest resource use. Complementary to this, Output 2.2 will formalize an agreement that permit a control use and extraction of coastal forest resources for FRMG members. The absence of such an agreement in coastal Bangladesh is one of the reasons of uncontrolled exploitation and resultant deforestation of coastal mangrove forests. If successful, these measures will lead to significant empowerment of these community members who are currently at the bottom segment of society. However, a risk that needs to be carefully monitored is the change in social dynamics in relation to local elites in the area. As described in the project proposal, these elites are one of the key players that drive poor families into speculative land-grabbing and they could potentially perceive that their vested interests being eroded by the project activity that promotes community participation in dialogues of coastal forest resource use.

210. The project will also be implemented in areas where settlements into newly accreted lands take place continuously reflecting the unique environmental conditions in this area. Settlements into these areas are also supported by GoB. Although the project activities do not directly invoke resettlements, the very objective of the project – reducing the vulnerability of coastal communities through strengthening coastal greenbelts and alternative livelihood strategies – may indirectly reinforce the existing trends of migration into coastal areas. Although the experience from CBACC has been that no visible negative social impacts attributable to the project has been observed, a sense of vigilance among community-based project staff and local government officers need to be maintained.

211. Interventions under Output 1.1 entail delivery of adaptive livelihood strategies in areas adjacent to new afforestation/reforestation areas. Some of the investments involve distribution of small land for the landless and other marginalized groups as part of the tested FFF model. This could potentially introduce a competition over finite amount of lands relative to the demand. And if lower bargaining power of the most vulnerable results in suboptimal allocation of adaptive livelihood options to them, it could potentially leads to lower than expected impacts in terms of vulnerability reduction. However, to prevent this, the process of identification of potential beneficiaries is bound by a pre-set list of beneficiary selection criteria, which place a considerable emphasis on the poorest, women, women-headed households and other disadvantaged groups, and selection is carried out in a participatory manner. Based on the experience from CBACC, no disputes or competitions have been reported to date. Also it is important to note that there will not be forced relocation of population associated with the provision of lands. This is because all lands to be used in the project are newly accreted lands which by law belong to either the Ministry of Land or Forest Department (depending on the years after stabilization of the land).

### Environmental risks and impacts

212. Outputs 1.1, 1.2, 2.2 and 3.2 will involve alteration in physical environment in the form of construction/introduction of diversified livelihood assets or strategies in coastal areas (Output 1.1), introduction of additional mangrove species to mangrove forests that are at least 5 years of age (Output 1.2), controlled use of coastal forest resources (Output 2.2) and construction/rehabilitation of built structures for the purpose of protecting livelihood assets (Output 3.2). Output 1.1 will also involve an activity where aquaculture (as part of the FFF model) will be implemented. Wastes from aquaculture production can potentially cause negative environmental impacts locally and the amount of wastes produced needs to be observed

continuously. However, it is important to note that none of the species (both mangrove species and fish/livestock) introduced in the project will be alien species, and following the practice in CBACC, no pesticide or herbicide will be used.

213. It is important to note that although these activities will involve alteration of physical environments in coastal areas in Bangladesh, negative environmental impacts are expected to be limited, if any, for the following reasons. First, large part of the areas that Output 1.1 focuses on are newly accreted, otherwise-barren lands that are unsuitable for conventional agricultural production or for plantation of any trees other than two pioneer species of mangrove. Second, when new mangrove species are introduced in more stable lands where mature plantations exist, these species are all endemic in Bangladesh and thus pose no risks of invasive alien species. Third, controlled/managed access to forest resources that is encouraged under Output 2.2 is limited to NTFP collection and will not involve felling of trees and the objective of Output 2.2 is precisely to reduce negative environmental impacts on coastal forest resources that currently exist from uncontrolled exploitation. Lastly, investments envisaged under Output 3.2 are largely small-scale such as excavation of existing, silted irrigation canal, provisions for drainage in embankments, and raising and concrete-lining of handpump platforms. Nonetheless, as described below, the project will engage a consultant to initiate a process of Environmental Clearance process, which is supported by the Environmental Conservation Rules 1997.

#### Proposed actions to remove and mitigate impacts

214. Potential social and environmental impacts associated with the implementation of the LDCF-financed project were reviewed carefully during the Local Project Appraisal Committee meeting, which had representatives from GoB and UNDP, and the following action points have been agreed.

215. Potential social impacts that may arise from the altered social dynamics, especially between the vulnerable/poor and local elites, will be closely monitored throughout the implementation of the project. The project proponent has agreed that some budget is earmarked and an assessment will be carried out in Year 3 of the project implementation to investigate whether any social issues have been observed in this regard and the extent to which the agreed beneficiary selection criteria have been adhered to. This assessment is expected to be conducted by a reputable NGO that has experience in this area. Raising awareness of project staff and stakeholders is also important. To this end, key project personnel such as project-funded Community Development Associates/Assistants who will be based in each upazila, will be informed and instructed during the inception meeting to monitor closely any frictions that may arise at local level. Similarly, local government officers will also be instructed to be on alert. This issue will be emphasized at the subnational level inception meeting in each District. Any issues will be reported in periodic meetings among the project management staff and the Government stakeholders both at the subnational and national level. Annual monitoring exercise as well as periodic field visits by MoEF officials and UNDP will be used to take stock of any issues, and if problems in fact arise, future actions will be discussed.

216. To address potential environmental impacts from the project, the project proponent also agreed that some budget is earmarked for initiating the GoB-compliant initial environmental screening process. To this end, a consultant will be hired in Year 1 of the project implementation to carry out a preliminary assessment to file an Environmental Clearance Certificate. This process will review all activities that potentially have negative environmental impacts and will result in recommendations for the IP to follow throughout the course of project implementation.

217. Moreover, for livelihood activities for which beneficiaries behaviours are critical in minimizing potential environmental impacts, such as the treatment of waste generated from aquaculture, issuance of code of conduct will be explored, and compliance monitored, during the project implementation. Finally, the project will also explore the opportunity to consult the Social and Environmental Management Framework of CRPARP which was developed in May 2013.



### III PROJECT RESULTS FRAMEWORK

<p><b>This project will contribute to achieving the following UNDAF Outcome (2012-2016):</b></p> <p>Outcome 5.1: By 2016, populations vulnerable to climate change and natural disaster have become more resilient to adapt with the risk.</p> <p>Outcome 5.2: By 2016, vulnerable populations benefit from natural resource management and environmental governance and low emission green development</p>
<p><b>UNDAF Outputs:</b></p> <p>Output 5.1.2: Community and local institutions have greater capacity on disaster risk reduction and climate change adaptation</p> <p>Output: 5.1.3: Communities, local and national governments have greater capacity to respond in emergencies</p> <p>Output 5.14: Communities, local and national authorities have better access to knowledge on climate change impact for better decision making</p> <p>Output 5.2.1: Communities and local and national governments are better able to conserve biodiversity and manage natural resources in a pro-poor and sustainable manner.</p>
<p><b>Primary applicable Key Environment and Sustainable Development Key Result Area: 3. <i>Promote climate change adaptation</i></b></p>
<p><b>Applicable Strategic Objective from LDCF Results-Based Management Framework:</b></p> <p><b>CCA-1:</b> <i>Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level</i></p>
<p><b>Applicable GEF Expected Outcomes:</b></p> <p>Outcome 1.1: Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas</p> <p>Outcome 1.3: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas</p>
<p><b>Applicable GEF Outcome/Output Indicators (AMAT):</b></p> <p><b>1.1.1.3. Regulatory reform and fiscal incentive structures introduced that incorporate climate change risk management</b></p> <p><b>1.3.1.1. % of targeted households that have adopted resilient livelihoods under existing and projected climate change</b></p>

	Indicator	Baseline	End of Project Targets	Source of verification	Risks and Assumptions
<b>Project Objective<sup>93</sup></b> Reduce vulnerability of communities to the adverse impacts of climate change through participative design, community-based management and diversification of afforestation and reforestation programmes	Differential survival rate of new coastal mangrove plantations with and without associated integrated livelihood diversification support  % of community members (gender disaggregated) who feel 'ownership' of coastal mangrove forest resources measured through change in score obtained through simplified adaptation of Knowledge, Attitude & Practices (KAP) survey method	There is no linking of coastal afforestation /reforestation with livelihood support  'Ownership' will be defined in the process of adapting KAP methodology for monitoring this indicator. A gender-disaggregated baseline will be established during the inception phase of the project	The survival rate of mangrove forests linked to livelihood support in CRPAR project afforestation sites is at least 15% higher than in afforestation sites without linked livelihood support  30% improvement in the sense of ownership towards coastal mangrove resources	Periodic monitoring PIR report <sup>94</sup> MTR <sup>95</sup> TE <sup>96</sup>  Administration of KAP survey MTR TE	<u>Risks</u> Survival rate of new coastal plantations in CRPAR project sites is negatively impacted by non-anthropogenic factors or other new threats not addressed in the project  Economic shocks and/or, environmental disasters further aggravate local poverty and vulnerability making it much more difficult or impossible to alter existing incentive structure that currently leads to coastal forest degradation and loss or to increase local ownership of coastal mangrove plantations  <u>Assumptions</u> Livelihood support in target project sites combined with benefits from forests will be sufficient to alter underlying incentive structure that currently results in degradation and loss of coastal mangrove plantation

<sup>93</sup> Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR

<sup>94</sup> Annual UNDP-GEF Project Implementation Review (PIR)

<sup>95</sup> Mid-Term Review (MTR)

<sup>96</sup> End of project Terminal Evaluation (TE)

	Indicator	Baseline	End of Project Targets	Source of verification	Risks and Assumptions
<b>Outcome 1<sup>97</sup></b> Vulnerability of communities in new afforestation and reforestation sites reduced through diversified livelihood options and more effective greenbelts	% of targeted households that have adopted resilient livelihoods under existing and projected climate change [AMAT 1.3.1.1]	Currently, livelihood strategies are not meaningfully integrated into coastal afforestation / reforestation programs, reducing the resilience of both livelihoods and coastal forest resources	At least 70% of 10,500 target households living adjacent to CRPAR coastal afforestation / reforestation sites have adopted resilient livelihoods introduced in the project	PIR Report MTR TE	<u>Risks</u> Slow local uptake of new knowledge and skills results in slow rate of adoption of resilient livelihoods  <u>Assumptions</u> Local elite capture of livelihood diversification support and other related social conflicts are effectively addressed  Livelihood diversification strategies introduced by the project generate enough benefit for local communities to be prepared to take on greater responsibility for the stewardship of coastal mangrove plantations
<b><u>Outputs Supporting Outcome 1</u></b> 1.1. Community-based adaptation and livelihood diversification measures are integrated with baseline afforestation and reforestation activities in 4 districts 1.2. Diversified trial plantations of up to 10 mangrove and non-mangrove varieties established in 4 districts to increase the adaptive capacity of greenbelt structures on accreted lands					
<b>Outcome 2</b> Strengthened community involvement in, and ownership of, forestry-based adaptation and climate risk reduction programmes	Regulatory reform and fiscal incentive structures introduced that incorporate climate change risk management [AMAT 1.1.1.3]	Currently there is no regulatory mechanism in place to provide sufficient incentives, through the security of future stream of benefits, to protect coastal forest resources	A formal government policy on benefit sharing agreement pertaining to coastal forest resources is in place	Existence of the policy	<u>Risks</u> Delays to formally adopt a policy for benefit-sharing result in limited time for demonstrating impacts  <u>Assumptions</u> Tangible economic benefits are generated from coastal

<sup>97</sup> All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.

	Indicator	Baseline	End of Project Targets	Source of verification	Risks and Assumptions
	Number of Forest Resource Management Group (FRMG) members (gender-disaggregated) who gain access to coastal forest resources underpinned by a formal benefit-sharing agreement	Currently, benefit-sharing agreement pertaining to coastal forest resources does not exist and hence any benefits extracted from coastal forests are not legally permitted	By the end of the project, at least 2,500 FRMG members (or 50% of all FRMG members) will have obtained access to coastal forest benefits	Official record pertaining to the access of forest resources  PIR Report MTR TE	forests as a result of forest diversification and co-management, which are a sufficient incentive to improve local stewardship of coastal forests  Sufficient capacity for co-management and benefit-sharing is developed by the project resulting in local communities including women being able to engage effectively in Forest Resource Management Groups and, through their representatives, in Co-Management Committees
<b><u>Outputs Supporting Outcome 2</u></b>					
2.1. Existing systems of participatory natural resource management applied to strengthen the climate resilience of coastal afforestation/reforestation programmes					
2.2. A forest product benefit sharing agreement between coastal communities and national government is developed and adopted					
2.3 Awareness and capacity of local communities and government staff to promote coastal greenbelt co-management and benefit sharing improved					
<b>Outcome 3</b> Communal livelihood assets in afforestation and reforestation sites are protected from extreme climate events through effective early warning and preparedness planning	The number of CPP volunteers trained for climate risks, disaster preparedness, and the benefits of coastal forests for climate risk mitigation	There are currently some 10,000 CPP volunteers in the 7 target project upazilas (50,000 in total in 27 coastal upazilas covered by CDMP). However, the existing CPP training methodology does not contain any elements pertaining to climate risks or benefits of coastal	By the end of the project, at least 6,000 volunteers (representing 60% of the existing CPP network in the project target sites) are trained on additional elements on climate change and disaster preparedness	QOR <sup>98</sup> PIR MTR TE	<u>Risks</u> Extreme climate events are worse than projected in terms of frequency and/or intensity and CPP network becomes too overstretched.  <u>Assumptions</u> Extreme climate events occur at similar frequency and levels of intensity as in recent past and in line with

<sup>98</sup> Quarterly Operational Report

	Indicator	Baseline	End of Project Targets	Source of verification	Risks and Assumptions
	The number and types of communal livelihood assets safeguarded from the potential impacts of extreme and localized climate events	<p>mangrove forests on mitigating such risks</p> <p>Only around 50% of existing length of coastal embankment (or 1250 km of a total of 2,500 km) currently has adequate drainage provision.</p> <p>There are currently only 300 killas compared to nearly 3,500 cyclone shelters most of which do not have killas nearby or provision for housing livestock within the shelter.</p> <p>Baselines on the number of freshwater supply infrastructure will be updated during the project inception phase and established for specific target districts and upazilas</p>	<p>By the end of the project, the following investments are complete:</p> <ul style="list-style-type: none"> <li>At least 25 km of embankment is equipped with sufficient drainage channel</li> <li>At least 10 killas are constructed providing additional safe havens for livestock</li> <li>At least 150 sets of freshwater supply infrastructure is safeguarded from floods</li> </ul>	<p>QOR<sup>99</sup></p> <p>PIR</p> <p>MTR</p> <p>TE</p>	<p>short-term climate projections.</p> <p>Additional communication equipment, gear and training increase capacity of CPP volunteers sufficiently to deliver effective early warning response for extreme climate events in target coastal afforestation /reforestation sites</p> <p>Sufficient land and access to land can be obtained near existing cyclone shelters without killas in target upazilas</p> <p>Design and construction of killas, climate-proofing of freshwater supply and infrastructure provision of drainage in areas of localized flooding within the embankment are technically sound.</p>

### **Outputs Supporting Outcome 3**

3.1. Strengthened CPP network capacity for effective early warning communications for extreme climate events in coastal afforestation sites

3.2. Communal livelihood assets in new afforestation and reforestation sites are protected from extreme climate events through dedicated disaster

<sup>99</sup> Quarterly Operational Report



	Indicator	Baseline	End of Project Targets	Source of verification	Risks and Assumptions
	preparedness and risk reduction measures (such as freshwater supply infrastructure, safe havens for livestock and improved drainage)				

## IV TOTAL BUDGET AND WORKPLAN

<b>Award ID:</b>	00075892		
<b>Award Title:</b>	PIMS 4878 LDCF2: Integrating Community-based Adaptation into Afforestation and Reforestation Programmes in Bangladesh		
<b>Business Unit:</b>	BGD10		
<b>Project Title:</b>	Integrating Community-based Adaptation into Afforestation and Reforestation Programmes in Bangladesh		
<b>PIMS no.</b>	4878		
<b>Implementing Partner (Executing Agency)</b>	Ministry of Environment and Forest		

GEF Outcome/Atlas Activity	Responsible Party / Implementing Agency	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	Budget Note
OUTCOME 1  Vulnerability of communities in new afforestation and reforestation sites reduced through diversified livelihood options and more effective greenbelts	MoEF	62160	LDCF	72100	Contractual services - Companies (FFF Model)	25,000	125,000	125,000	50,000	325,000	1A
				72100	Contractual services - Companies (Agriculture)	25,000	165,000	150,000	50,000	390,000	1B
				72100	Contractual services - Companies (Fisheries)	50,000	165,000	150,000	50,000	415,000	1C
				72100	Contractual services - Companies (livestock)	25,000	215,000	200,000	50,000	490,000	1D
				72100	Contractual services - Companies (Other Innovative options)	25,000	165,000	150,000	50,000	390,000	1E
				72100	Contractual services - Companies (Mixed species demonstration)	40,000	150,000	150,000	50,000	390,000	1F
				72100	Contractual services - Companies (Mixed species protection and maintenance)		4,000	4,000	2,000	10,000	1G
				72100	Contractual services - Companies (Assessment of beneficiary selection performance)			10,000		10,000	1H

				71300	Local consultants- Climate Change Adaptation Specialist	7,500	7,500	7,500		22,500	1I
				71300	Local consultants- Climate Resilient livelihood Specialist	7,500	7,500	7,500		22,500	1J
				71300	Local consultants - Environmental and social screening	8,000				8,000	1K
				71400	Service Contract-Individual (M&E Specialist)	24,000	24,000	24,000	24,000	96,000	1L
				71400	Contractual Services- Individual (Community Development Associates- 4 )	48,000	48,000	48,000	48,000	192,000	1M
				71400	Contractual Services- Individual (Community Development Assistants7)	58,800	58,800	58,800	58,800	235,200	1 N
				71200	Mid Term Evaluation- Team leader		12,900			12,900	1O
				71200	Terminal Evaluation - Team Leader				19,200	19,200	1P
				71300	Mid Term Evaluation- Local Consultant		4,500			4,500	1Q
				71300	Terminal Evaluation - Local Consultant				6,750	6,750	1R
				71600	Travel	15,000	15,000	15,000	15,000	60,000	1S
				72200	Equipment and furniture	15,000				15,000	1T
				75700	Training, Workshops and Conferences (Local level)	12,000	12,500	17,000	10,000	51,500	1U
				75700	Training, Workshops and Conferences (National level)	2,000	3,000	5,000	3,000	13,000	1V
				74200	Audiovisual & Print Production Costs	5,000	5,000	5,000	5,000	20,000	1W
				72500	Supplies	5,000	5,000	5,000	5,000	20,000	1X
				74500	Miscellaneous Expenses	5,350	5,200	5,200	5,200	20,950	1Y

					Sub-total Outcome 1	403,150	1,197,900	1,137,000	501,950	3,240,000	
OUTCOME 2  Strengthened community involvement in, and ownership of, forestry-based adaptation and climate risk reduction programmes	BFD	62160	LDCF	71300	Local consultants (Land Use policy Expert)	9,000	6,000			15,000	2A
				71300	Local consultants (Benefit Sharing Expert)		6,000	9,000		15,000	2B
				71300	Local consultants (Knowledge Management Expert)			6,000	9,000	15,000	2C
				71300	Local consultants (Policy Institution Expert)	6,000	9,000			15,000	2D
				71300	Local consultants (MIS)		6,000	9,000		15,000	2E
				71200	Mid Term Evaluation-Team leader		3,225			3,225	2F
				71200	Terminal Evaluation - Team Leader				4,800	4,800	2G
				71300	Mid Term Evaluation - Local Consultant		1,125			1,125	2H
				71300	Terminal Evaluation - Local Consultant				1,688	1,688	2I
				71400	Contractual Services-Individual	18,000	18,000	18,000	18,000	72,000	2J
				72100	Contractual Services - Companies		100,000	125,000		225,000	2K
				71600	Travel	13,000	13,000	13,000	16,000	55,000	2L
				73400	Rental - Transport Equipment (Speed Boat +Fuel etc)	21,300	25,000	25,000	25,000	96,300	2M
				75700	Training, Workshops and Conferences	5,000	10,000	20,000	15,000	50,000	2N
				74200	Printing & Publication	5,000	8,000	18,000	18,000	49,000	2O
				74500	Miscellaneous Expenses	1,600	1,500	1,500	2,262	6,862	2P
					Sub-total Outcome 2	78,900	206,850	244,500	109,750	640,000	
OUTCOME 3  Communal	MoEF	62160	LDCF	72200	Equipment and furniture		350,000			350,000	3A
				75700	Training, Workshops and						3B

livelihood assets in afforestation and reforestation sites are protected from extreme climate events through effective early warning and preparedness planning					Conferences		40,000	80,000		120,000	
				72100	Contractual services - Companies (Killa Construction & Pond)	80,000	200,000	200,000		480,000	3C
				72100	Contractual services - Companies (Embankment & safe drinking water)	50,000	200,000	200,000	50,000	500,000	3D
				71200	Mid Term Evaluation-Team leader		5,375			5,375	3E
				71200	Terminal Evaluation - Team Leader		1,875			1,875	3F
				71300	Mid Term Evaluation - Local Consultant				8,000	8,000	3G
				71300	Terminal Evaluation - Local Consultant				2,812	2,812	3H
				71300	Local Consultants	2,200	5,000			7,200	3I
				71300	Local consultants - Environmental and social screening	2,000				2,000	3J
				71600	Travel	3,000	3,000	3,000	3,000	12,000	3K
				74500	Miscellaneous Expenses	2,500	2,500	2,500	3,238	10,738	3L
					<b>Sub-total Outcome 3</b>	<b>139,700</b>	<b>807,750</b>	<b>485,500</b>	<b>67,050</b>	<b>1,500,000</b>	
PROJECT MANAGEMENT	MoEF	62160	LDCF	71400	Service Contract-Individual (Project Manager)	28,800	28,800	28,800	28,800	115,200	0A
				71400	Service Contract-Individual (Admin & Finance Associate)	12,000	12,000	12,000	12,000	48,000	0B
				71400	Service Contract-Individual (Project Assistant)	7,200	7,200	7,200	7,200	28,800	0C
				71600	Travel	3,500	2,000	2,000	2,000	9,500	0D
				72200	Equipment and furniture (PMU)	11,000	-	-	-	11,000	0E
				75700	Training, Workshops and Conferences	6,000	1,500	1,500	2,000	11,000	0F
				72500	Supplies	4,000	4,500	4,500	3,997	16,997	0G

				73400	Operations & maintenance	3,000	4,000	4,000	3,000	14,000	OH
				74599	UNDP Cost Recovery Charges bills	6,371	3,306	2,833	2,993	15,503	OI
					<b>Sub-total PMU</b>	<b>81,871</b>	<b>63,306</b>	<b>62,833</b>	<b>61,990</b>	<b>270,000</b>	
					<b>Project Total</b>	<b>703,621</b>	<b>2,275,806</b>	<b>1,929,833</b>	<b>740,740</b>	<b>5,650,000</b>	

**Summary of  
Funds:**<sup>100</sup>

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	TOTAL Y1- Y4
<b>LDCF</b>	<b>703,621</b>	<b>2,275,806</b>	<b>1,929,833</b>	<b>740,740</b>	<b>5,650,000</b>
<b>BCCRF CRPARP</b>	2,500,000	10,000,000	10,000,000	12,500,000	35,000,000
<b>USAID CREL</b>	500,000	4,000,000	5,000,000	500,000	10,000,000
<b>UNDP CDMP-II</b>	-	1,000,000	1,000,000	-	2,000,000
<b>TOTAL</b>	<b>3,703,621</b>	<b>17,275,806</b>	<b>17,929,833</b>	<b>13,740,740</b>	<b>52,650,000</b>

<sup>100</sup> Summary table should include all financing of all kinds: GEF financing, co-financing, cash, in-kind, etc...



**Budget Notes** (all figures are in US dollar)

Note	Description of cost item
	Contractual services Site specific Community-Based Adaptation Measures will be developed for 4 project sites through the respective government departments i.e. DAE for agricultural adaptation, DoF for fisheries adaptation, DoL for livestock adaptation, etc. Total allocation for this service is \$2,010,000. A breakdown of the costs per implementing partners is as below
1A	Construction of FFF model targeting 500 households: \$ 325,000 (Y1-4). This will be supported by the Forest Department
1B	Dissemination/propagation of community-based adaptation option for agriculture (resilient seed varieties, techniques and tools for intercropping/alley cropping, etc) targeting 2,500 households: \$390,000 (Y1-4). This will be supported by the Department of Agriculture Extension
1C	Livelihood support for fishers targeting 2,500 households: \$415,000 (Y1-4) This will be supported by the Department of Fisheries
1D	Diversified livestock rearing targeting 2,500 landless or land-poor households (duck, pigeon, chicken, etc): \$490,000 (Y1-4) This will be supported by the Department of Livestock
1E	Additional livelihood diversifications support (e.g. apiculture and honey processing, seedbeds nursery, floating vegetable cultivation, cultivation and marketing of flowers): \$390,000 (Y1-4)
1F	Diversified "model" plantation support covering 650 ha (@ approximately \$610/ha using 12 species).
1G	Maintenance of the diversified "model" plantation: \$10,000 (Y2-3)
1H	A subnational level assessment of the performance of the beneficiary selection: \$10,000 (Y2)
1I & 1J	Local consultants: Total \$45,000 1. Climate Change Adaptation Specialist: 9 months (Y1-3 @\$2,500/month) 2. Climate Resilient Livelihood Specialist: 9 months (Y1-3 @\$2,500/month)
1K	Environmental and social screening consultant: \$10,000 (Prorated) Outcome 1 contribution is 80% of the total)
1L	Monitoring and Evaluation specialist: 48 months (Y1-4 @2,000/month)
1M & 1N	1. 4 Community Development Associates: Each 48 months (Y1-4 @\$1,000/month) 2. 7 Community Development Assistants: Each 48 months (Y1-4 @\$700/month)
1O	International consultants for MTR: \$21,500 (Prorated across Outcomes) 30 days for mid-term evaluation (Y2): 30 x \$700 = total \$21,000 plus \$500 each for in-country provision. (Component 1 contribution is 60% of the total)
1P	International consultants for TE: \$32,000 (Prorated across Outcomes) 45 days for mid-term evaluation (Y4): 45 x \$700 = total \$31,500 plus \$500 each for in-country provision. (Component 1 contribution is 60% of the total)
1Q	National consultants for MTR: \$7,500 (Prorated across Outcomes) 30 days for mid-term evaluation (Y2): 30 x \$250 = total \$7,500. (Component 1 contribution is 60% of the total)
1R	National consultants for TE: \$11,250 (Prorated across Outcomes) 30 days for mid-term evaluation (Y4): 45 x \$250 = total \$11,250. (Component 1 contribution is 60% of the total)
1S	Domestic travel

1T	Equipment needed for Community Development Associates and Assistants based in District Forest Divisional Offices
1U	Training and workshops planned at the sub-national level including capacity building workshop focusing on adaptive benefits of diversified livelihoods
1V	Trainings, workshops and knowledge dissemination events at the national level
1W	Brochures, factsheets, booklets, documentaries and other publicity materials
1X	Office supplies for field based officers
1Y	Approximately 0.6% of the total Outcome 1 budget during Y1-Y4 is allocated for contingencies related to inflation, currency exchange fluctuations and other external shocks and contingencies, which would increase the cost of travel and materials
2A-2E	Local consultants: Total \$75,000 1. Land-use policy expert: 6 months (Y1-2 @\$2,500/month) – Output 2.1 2. Benefit-sharing expert: 6 months (Y2-3 @\$2,500/month) – Output 2.2 3. Knowledge management expert: 6 months (Y3-4 @\$2,500/month) – Output 2.3 4. Policy Institution Expert: 6 months (Y1-2 @\$2,500/month) – Output 2.2 5. MIS specialist: 6 months (Y2-3 @\$2,500/month) – Output 2.1
2F	International consultants for MTR: \$21,500 (Prorated across Outcomes) 30 days for mid-term evaluation (Y2): 30 x \$700 = total \$21,000 plus \$500 each for in-country provision. (Component 2 contribution is 15% of the total)
2G	International consultants for TE: \$32,000 (Prorated across Outcomes) 45 days for mid-term evaluation (Y4): 45 x \$700 = total \$31,500 plus \$500 each for in-country provision. (Component 2 contribution is 15% of the total)
2H	National consultants for MTR: \$7,500 (Prorated across Outcomes) 30 days for mid-term evaluation (Y2): 30 x \$250 = total \$7,500. (Component 2 contribution is 15% of the total)
2I	National consultants for TE: \$11,250 (Prorated across Outcomes) 30 days for mid-term evaluation (Y4): 45 x \$250 = total \$11,250. (Component 2 contribution is 15% of the total)
2J	Communication Officer: 48 months (Y1-4 @\$1,500/month)
2K	Awareness, Training and Capacity Building activities for relevant government officials at the local level, and the CMC members through outsourcing the service to companies preferably to a competent NGO through competitive process by UNDP in consultation with National Project Director under UNDP Direct Country Support.
2L	Local travel
2M	Transport Equipment: the target areas are very remote and hard to reach and speed boats are often the only means for communication. The allocation is made for covering the costs for boat/speed boat rentals and associated fuel costs.
2N	Workshops and trainings on FRMG/CMC membership, facilitation of CMC participation in Disaster Management Committees, regular meetings/workshops between FRMGs and CMCs, policy discussions on experience from benefit-sharing, and general awareness raising (national and local) throughout Output 2.3
2O	Printing of brochures and booklets on FRMG and CMC membership and awareness raising materials for benefit-sharing agreement
2P	Approximately 1% of the total Outcome 1 budget during Y1-Y4 is allocated for contingencies related to inflation, currency exchange fluctuations and other external shocks and contingencies, which would increase the cost of travel and materials
3A	First aid kit, gears, and communication equipment's for CPP volunteers in 7 target upazilas

3B	Training/workshop/conference for about 6,000 CPP volunteers on basic climate change adaptation and emergency response (Y2-3)
3C	Construction of 10 killa (raised earthen platform) and associated pond management for communal livelihood asset protection, especially livestock @ \$48,000 each.
3D	<ul style="list-style-type: none"> <li>Improving drainage facility along embankments @ \$19,220/km for 25km (total \$480,500)</li> <li>Improvement/climate-proofing of small freshwater infrastructure @ \$130 per tube/well for 150 tubes/wells (total \$19,500)</li> </ul>
3E	International consultants for MTR: \$21,500 (Prorated across Outcomes) 30 days for mid-term evaluation (Y2): 30 x \$700 = total \$21,000 plus \$500 each for in-country provision. (Component 3 contribution is 25% of the total)
3F	International consultants for TE: \$32,000 (Prorated across Outcomes) 45 days for mid-term evaluation (Y4): 45 x \$700 = total \$31,500 plus \$500 each for in-country provision. (Component 3 contribution is 25% of the total)
3G	National consultants for MTR: \$7,500 (Prorated across Outcomes) 30 days for mid-term evaluation (Y2): 30 x \$250 = total \$7,500. (Component 3 contribution is 15% of the total)
3H	National consultants for TE: \$11,250 (Prorated across Outcomes) 30 days for mid-term evaluation (Y4): 45 x \$250 = total \$11,250. (Component 3 contribution is 25% of the total)
3I	Site Engineer to plan and supervise the construction and maintenance works for Killa, pond, drainage improvement, and tube/well improvement: 8 months (Y1-2 @ \$900/month)
3J	Environmental and social screening consultant: \$10,000 (Prorated) Outcome 3 contribution is 20% of the total)
3K	Local travel
3L	Approximately 0.7% of the total Outcome 1 budget during Y1-Y4 is allocated for contingencies related to inflation, currency exchange fluctuations and other external shocks and contingencies, which would increase the cost of travel and materials
	PROJECT MANAGEMENT
0A	Salaries for 48 months of National Project Coordinator (@ \$2,400/month)
0B	Salaries for 48 months of Administrative/Financial Associate (@ \$1,000/month)
0C	Salaries for 48 months of Project Assistant (@ \$600/month)
0D	Travel for periodic monitoring and spot checks for PMU staff as well as government officials. This also includes DSA.
0E	PMU office set up including 3 laptops, printer and photocopier. There is also allocation for multi-media, Life-jacket for field staff and, fax machine for PMU. Total \$11,000
0F	\$5,000 for inception workshop; \$1,000-2,000/year for Project Board meeting related expenditures
0G	Office supplies
0H	Repairing and maintenance of equipment, rent vehicle and boat, fuel cost etc. Fuel cost of the government vehicles used by Project Management Unit will be covered from this budget too. Total \$14,000
0I	Direct Project Services (DPS) refers to project 'execution services' which UNDP provides at the request of government to support the procurement of goods and services, recruitments, payments, etc. The services are charged on an item by item basis against UNDP's Universal Price List (UPL). The estimated breakdown of the DPS is as follows:

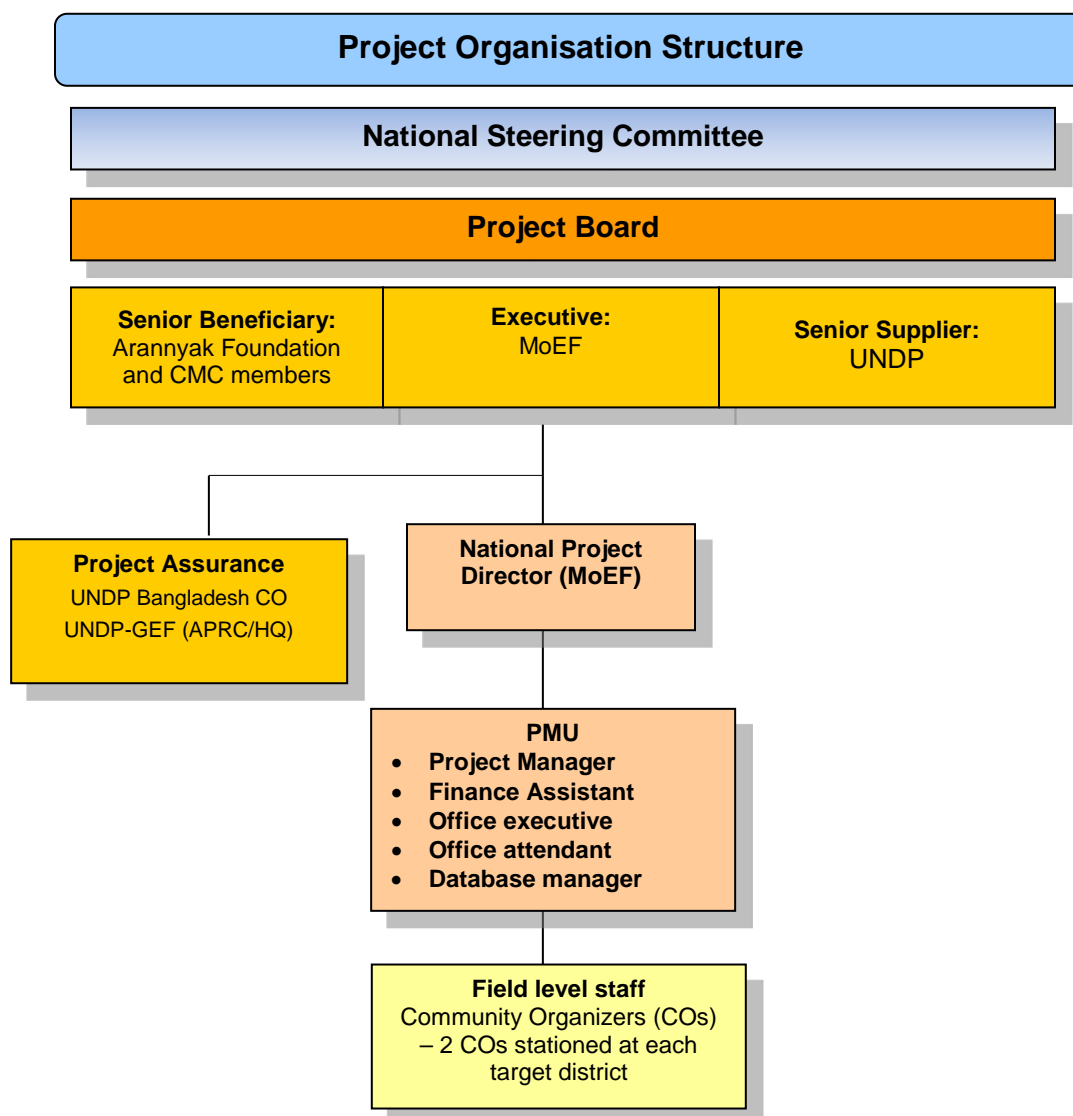
	<ul style="list-style-type: none"> <li>• Recruitment of project personnel</li> <li>• Issuance of contracts</li> <li>• Procurement</li> </ul> <p>Total is \$15,503. This estimate is based on the actual DPS incurred during the first LDCF project.</p>
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## V MANAGEMENT ARRANGEMENTS

### 5.1 Project executive and implementing partner (GoB):

The project will be executed according to UNDP's National Implementation Modality (NIM), as per the NIM project management implementation guidelines agreed by UNDP and the Government of Bangladesh.

### 5.2 Project Organogram, Management Structure and Responsibilities



**Implementing Partner (IP).** At the national level, the Ministry of Environment and Forest (MoEF), will act as the Implementing Partner (Project Executive) of the project. Based on the standard NIM procedures, the MoEF will be responsible for the overall project and reporting to UNDP Bangladesh Country Office. The MoEF will establish a Project Management Unit (PMU) in Dhaka with a full time National Project Manager and other core project staff. The Project Executive (MoEF) will appoint the Secretary of the MoEF as the National Project Director (NPD), given the strategic importance of the project. The NPD will be supported by the National Project Manager within the PMU.

**Responsible Party (RP).** The MoEF will designate the Department of Forest (DF), within the MoEF, as a responsible party to implement Outcome 1 of the proposed project. The DF is considered best placed to carry out activities related to Outcome 1 as they are the main focal agency for the baseline CRPAR project. This will ensure smooth coordination and alignment with the baseline project and that the additionality of LDCF resources over the baseline development is maintained. As per the standard UNDP modality, the DF, as an RP, will be responsible for the delivery of the results towards achieving Outcome 1 and accountable to the National Project Director.

**National Steering Committee (Outcome Board).** The National Steering Committee (or also known as the Outcome Board) will be established by the Ministry of Environment and Forests (MoEF). It is chaired by the Secretary of the MoEF and the members include the UNDP Resident Representative and senior officials of the respective ministries, implementing agencies, District Commissioners and those cooperating organizations/institutions, which have a direct bearing on the successful implementation of the project. The Outcome Board can co-opt members as deemed necessary. It will meet on a six-monthly basis, or more frequently if necessary.

**Project Board (PB).** The PB is responsible for making management decisions for a project in particular when strategic guidance and decisions are required. The PB plays a critical role in project monitoring and evaluations by assuring quality of the project's processes and products, and using evaluations for performance improvement, accountability and learning. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems with external bodies. In addition, it approves the appointment and responsibilities of the National Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual WorkPlan, the Project Board can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans.

In order to ensure UNDP's ultimate accountability for the project results, Project Board decisions will be made in accordance to standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case consensus cannot be reached within the Board, the final decision shall rest with the UNDP Project Manager (i.e. UNDP Bangladesh CO). Given the close coordination that this project will ensure with the CRPAR project and USAID CREL project, representatives from these projects will be invited to the Board. The Project Board contains three distinct roles, including:

**An Executive:** individual representing the project ownership to chair the group. This will be the National Project Director.



**Senior Supplier:** individual or group representing the interests of the parties concerned which provide funding for specific cost sharing projects and/or technical expertise to the project. The Senior Supplier's primary function within the Board is to provide guidance regarding the technical feasibility of the project. This will be a Representative from UNDP that is held accountable for fiduciary oversight of LDCF resources in this initiative.

**Senior Beneficiary:** individual or group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the Board is to ensure the realization of project results from the perspective of project beneficiaries. This will be representatives from Arannyak Foundation and selected members of Co-Management Committees.

### **Specific responsibilities of the PB:**

#### Defining a project

- Review and approve the Initiation Plan (if such plan was required and submitted to the Local PAC).

#### Initiating a project

- Agree on Project Manager's responsibilities, as well as the responsibilities of the other members of the Project Management Unit;
- Delegate any Project Assurance function as appropriate;
- Review the Progress Report for the Initiation Stage (if an Initiation Plan was required);
- Review and appraise detailed Project Plan and Annual Work Plan, including Atlas reports covering activity definition, quality criteria, issue log, updated risk log and the monitoring and communication plan.

#### Running a project

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- Address project issues as raised by the Project Manager;
- Provide guidance and agree on possible countermeasures/management actions to address specific risks;
- Agree on Project Manager's tolerances in the Annual Work Plan and quarterly plans when required;
- Conduct regular meetings to review the Project Quarterly Progress Report and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans.
- Review Combined Delivery Reports (CDR) prior to certification by the Implementing Partner;
- Appraise the Project Annual Review Report, make recommendations for the next Annual WorkPlan, and inform the Outcome Board about the results of the review.
- Review and approve end project report, make recommendations for follow-on actions;
- Provide ad-hoc direction and advice for exception situations when project manager's tolerances are exceeded;
- Assess and decide on project changes through revisions;

#### Closing a project

- Assure that all Project deliverables have been produced satisfactorily;
- Review and approve the Final Project Review Report, including Lessons-learned;
- Make recommendations for follow-on actions to be submitted to the Outcome Board;
- Commission project evaluation (only when required by partnership agreement)
- Notify operational completion of the project to the Outcome Board

**Specific Responsibilities of Executive** (as part of the above responsibilities for the Project Board)

- Ensure that there is a coherent project organisation structure and logical set of plans
- Set tolerances in the Annual Work Plan and other plans as required for the Project Manager
- Monitor and control the progress of the project at a strategic level
- Ensure that risks are being tracked and mitigated as effectively as possible
- Brief Outcome Board and relevant stakeholders about project progress
- Organise and chair Project Board meetings
- The Executive is responsible for overall assurance of the project as described below. If the project warrants it, the Executive may delegate some responsibility for the project assurance functions.

**Specific Responsibilities of Senior Supplier** (as part of the above responsibilities for the Project Board)

- Make sure that progress towards the outputs remains consistent from the supplier perspective
- Promote and maintain focus on the expected project output(s) from the point of view of supplier management
- Ensure that the supplier resources required for the project are made available
- Contribute supplier opinions on Project Board decisions on whether to implement recommendations on proposed changes
- Arbitrate on, and ensure resolution of, any supplier priority or resource conflicts

The supplier assurance role responsibilities are to:

- Advise on the selection of strategy, design and methods to carry out project activities
- Ensure that any standards defined for the project are met and used to good effect
- Monitor potential changes and their impact on the quality of deliverables from a supplier perspective
- Monitor any risks in the implementation aspects of the project

**Specific Responsibilities of Senior Beneficiary** (as part of the above responsibilities for the Project Board)

- Ensure the expected output(s) and related activities of the project are well defined
- Make sure that progress towards the outputs required by the beneficiaries remains consistent from the beneficiary perspective
- Promote and maintain focus on the expected project output(s)
- Prioritise and contribute beneficiaries' opinions on Project Board decisions on whether to implement recommendations on proposed changes
- Resolve priority conflicts

The assurance responsibilities of the Senior Beneficiary are to check that:

- Specification of the Beneficiary's needs is accurate, complete and unambiguous
- Implementation of activities at all stages is monitored to ensure that they will meet the beneficiary's needs and are progressing towards that target
- Impact of potential changes is evaluated from the beneficiary point of view
- Risks to the beneficiaries are frequently monitored

**Project Management Unit (PMU):** The PMU will be based in Dhaka within the MoEF. It will consist of a National Project Manager, a procurement and logistics associate, a finance

assistant, an office executive, and an office attendant. The PMU will amongst other tasks, i) develop Standard Operating Procedures for project implementation, ii) develop Quarterly and Annual WorkPlans and Budgets, iii) provide financial and administrative management support, iv) prepare Quarterly and Annual Financial and Technical Progress Reports to be submitted to the MoEF, and v) ensure compliance with applicable UNDP/GEF/LDCF/Government rules and regulations.

**National Project Manager:** The Project Manager has the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the Board. The Project Manager's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

Terms of References of key project staff and experts are provided in Annex 9.

The sub-national level project activities will be supported by Community Organizers based at four Divisional Forest Offices in project target areas. Eight Community Organizers will be recruited to facilitate activities at the local site level and report to the Project Management Unit. The Forest Department will provide office space and necessary communication facilities such as telephone and fax services for the Community Organizers.

### **5.3 Audit arrangements**

Audits will be conducted in accordance with the UNDP NIM Audit policies and procedures, and based on UN Harmonized Approach to Cash Transfer (HACT) policy framework. Annual audit of the financial statements relating to the status of UNDP (including GEF) funds will be undertaken according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by a special and certified audit firm. UNDP will be responsible for making audit arrangements for the project in communication with the Project Implementing Partner. UNDP and the project Implementing Partner will provide audit management responses and the Project Manager and project support team (PSU) will address audit recommendations. As a part of its oversight function, UNDP will conduct audit spot checks at least two times a year.

### **5.4 UNDP support services**

As per standard agreement between UNDP and the Government of Bangladesh, and upon request from the Implementing Partner (IP), UNDP Bangladesh CO may provide the following support services to the IP, and recover the actual direct and indirect costs incurred by the MCO in delivering such services:

- Payments, disbursements and other financial transactions
- Recruitment of staff, project personnel, and consultants
- Procurement of services and equipment, including disposals
- Organization of training activities, conferences, and workshops, including fellowships
- Travel authorization, Government clearances ticketing, and travel arrangements
- Shipment, custom clearance, and vehicle registration.

For more information, see Budget Note item 01 in Section 4. The estimate for UNDP Country Office Support Services presented in Budget Note item 01 will be validated and recorded in a Letter of Agreement before the inception of the project.

## **5.5 Intellectual property rights**

These will be retained by the employing organization of the personnel who develops intellectual products, either Government or UN/UNDP in accordance with respectively national and UN/UNDP policies and procedures.

## VI 6. MONITORING FRAMEWORK AND EVALUATION

The project will be monitored through the following M&E activities. The M&E budget is provided in the table below. The M&E framework set out in the Project Results Framework in Part III of this project document is aligned with the AMAT and UNDP M&E frameworks.

### 6.1 Project start and implementation

A Project Inception Workshop will be held within the first 3 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The **Inception Workshop** should address a number of key issues including:

- Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- Based on the project results framework and the LDCF related AMAT set out in the Project Results Framework in Section III of this project document, and finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- Discuss financial reporting procedures and obligations, and arrangements for annual audit.
- Plan and schedule PB meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first PB meeting should be held within the first 12 months following the inception workshop.

An **Inception Workshop report** is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

#### Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

**Annually:**

Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

- The APR/PIR includes, but is not limited to, reporting on the following:
- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR

**Periodic Monitoring through site visits:**

UNDP CO and the UNDP GEF region based staff will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

**6.2 Mid-term of project cycle**

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation expected to be in May 2015. The Mid-Term Review will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term review will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term review will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The LD/FC/SCCF AMAT as set out in the Project Results Framework in Section III of this project document) will also be completed during the mid-term evaluation cycle. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the [UNDP Evaluation Office Evaluation Resource Center \(ERC\)](#).

**6.3 End of Project**

An independent Terminal Evaluation will take place three months prior to the final PB meeting and will be undertaken in accordance with UNDP-GEF guidance. The terminal evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term review, if any such correction took place). The terminal evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-



GEF. The LD/SCCF AMAT as set out in the Project Results Framework in Section III of this project document) will also be completed during the terminal evaluation cycle. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response, which should be uploaded to PIMS and to the [UNDP Evaluation Office Evaluation Resource Center \(ERC\)](#).

### **Learning and knowledge sharing:**

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. There will be a two-way flow of information between this project and other projects of a similar focus.

### **Communications and visibility requirements**

Full compliance is required with UNDP's Branding Guidelines. These can be accessed at <http://intra.undp.org/coa/branding.shtml>, and specific guidelines on UNDP logo use can be accessed at: <http://intra.undp.org/branding/useOfLogo.html>. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: [http://www.thegef.org/gef/GEF\\_logo](http://www.thegef.org/gef/GEF_logo). The UNDP logo can be accessed at <http://intra.undp.org/coa/branding.shtml>.

Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: [http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08\\_Branding\\_the\\_GEF%20final\\_0.pdf](http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf). Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

### **Audit:**

The Project will be audited in accordance with UNDP Financial Regulations and Rules and applicable audit policies

## 6.4 M&E workplan and budget

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
Inception Workshop and Report	<ul style="list-style-type: none"> <li>Project Manager</li> <li>PMU</li> <li>UNDP CO, UNDP GEF</li> </ul>	Indicative cost: \$5,000	Within first two months of project start up
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> <li>UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members</li> <li>PMU</li> </ul>	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on <i>output and implementation</i>	<ul style="list-style-type: none"> <li>Oversight by Project Manager</li> <li>PMU</li> <li>Implementation teams</li> </ul>	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> <li>Project Manager</li> <li>PMU</li> <li>UNDP CO</li> <li>UNDP RTA</li> <li>UNDP EEG</li> </ul>	None	Annually
Periodic status/ progress reports	<ul style="list-style-type: none"> <li>Project Manager and team</li> </ul>	None	Quarterly
Mid-term Evaluation	<ul style="list-style-type: none"> <li>Project Manager</li> <li>PMU</li> <li>UNDP CO</li> <li>UNDP RCU</li> <li>External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost: \$29,000	At the mid-point of project implementation.
Terminal Evaluation	<ul style="list-style-type: none"> <li>Project Manager</li> <li>PMU</li> <li>UNDP CO</li> <li>UNDP RCU</li> <li>External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost : \$43,250	At least three months before the end of project implementation
Synthesis of major achievements & Lessons learned report	<ul style="list-style-type: none"> <li>Project Team</li> <li>UNDP CO</li> <li>BFD</li> <li>CMCs/FRMGs</li> <li>Key Project Cofinancing Partners (BCCRF CRPARP /USAID CREL /CDMP)</li> </ul>	\$10,000	

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
	<ul style="list-style-type: none"> <li>▪ UNDP-GEF RCU</li> </ul>		
Audit	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ Project Manager</li> <li>▪ PMU</li> </ul>	Indicative cost per year: \$3,000 (\$12,000 total)	Yearly
Visits to field sites	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ UNDP RCU (as appropriate)</li> <li>▪ Government representatives</li> </ul>	For GEF supported projects, paid from IA fees and operational budget	Yearly for UNDP CO; as required by UNDP RCU
<b>TOTAL indicative COST</b> Excluding project team staff time and UNDP staff and travel expenses		US\$ 99,250 (+/- 5% of total budget)	

## VII 7. LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

- put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP/GEF hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

The UNDP Resident Representative in Bangladesh is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP Regional Coordination Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- Revision of, or addition to, any of the annexes to the Project Document;
- Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
- Inclusion of additional annexes and attachments only as set out here in this Project Document

## 8. Annexes

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