



**PROJECT IDENTIFICATION FORM (PIF)**  
**PROJECT TYPE: FULL-SIZED PROJECT**  
**TYPE OF TRUST FUND: LDCF**

For more information about GEF, visit [www.TheGEF.org](http://www.TheGEF.org)

**PART I: PROJECT IDENTIFICATION**

<b>Project Title:</b>	Community-based Climate Resilient Fisheries and Aquaculture Development in Bangladesh		
<b>Country(ies):</b>	Bangladesh	<b>GEF Project ID:<sup>1</sup></b>	5636
<b>GEF Agency(ies):</b>	FAO	<b>GEF Agency Project ID:</b>	626403
<b>Other Executing Partner(s):</b>	Department of Fisheries	<b>Submission Date:</b>	January 29, 2014
<b>GEF Focal Area (s):</b>	Climate Change	<b>Project Duration (months):</b>	48 months
<b>Name of parent program (if applicable):</b> <ul style="list-style-type: none"> <li>• For SFM/REDD+ <input type="checkbox"/></li> <li>• For SGP <input type="checkbox"/></li> <li>• For PPP <input type="checkbox"/></li> </ul>	N/A	<b>Agency Fee (\$):</b>	515,386

**A. FOCAL AREA STRATEGY FRAMEWORK<sup>2</sup>:**

Focal Area Objectives	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-Financing (\$)
CCA-1: Reduce vulnerability to the adverse impacts of CC	LDCF	1,050,000	4,320,000
CCA-2: Increase adaptive capacity to respond to the impacts of CC	LDCF	754,000	3,255,000
CCA -3: Promote transfer and adoption of adaptation technology	LDCF	3,621,114	7,625,000
<b>Total project costs</b>		<b>5,425,114</b>	<b>15,200,000</b>

**B. PROJECT FRAMEWORK**

<b>Project Objective:</b> Building climate change (CC) adaptive capacity of vulnerable fisheries and aquaculture communities in Bangladesh						
Project Component	Grant Type <sup>3</sup>	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-financing (\$)
Component 1: Climate resilient fisheries sector through relevant national capacity development	TA	1. Improved relevant national policies and strategies to facilitate climate resilient fisheries sector and development at all levels.  <b>Indicators:</b> a) Revised Fisheries and Aquaculture strategies incorporating climate change considerations.  b) Revised fishery sector policy taking in consideration CC	1.1 Climate induced risks and vulnerability of fisheries and aquaculture sub-sectors at national level assessed with special focus on climate sensitive areas.  1.2 Relevant national policies and strategies reviewed, gaps analyzed and revised by incorporating fisheries and aquaculture adaptation to climate	LDCF	1,000,000	4,400,000

<sup>1</sup> Project ID number will be assigned by GEFSEC.

<sup>2</sup> Refer to the reference attached on the Focal Area Results Framework and LDCF/SCCF Framework when completing table A.

<sup>3</sup> TA includes capacity building and research and development.

		adaptation.	change needs. 1.3 Capacity building strategy for DoF, other relevant GoB agencies, private sector and community based organizations developed to facilitate climate resilient fisheries sector developed.			
Component 2: Strengthening knowledge and awareness of fisheries/aquaculture dependent communities facing the adverse impacts of climate change	TA	2. Local community organizations have institutionalized disaster risk management (DRM) in their local development plans and programmes, thus improving local CC related governance.  <b>Indicators:</b> a) Risk and vulnerability assessments conducted and updated.  b) Number of local development plans/programmes including DRM considerations.	2.1 Community perceptions, risks and vulnerability of fisheries, aquaculture and livelihoods to the adverse impacts of climate change including knowledge gaps assessed with the participation of relevant stakeholders and DoF field officials in project sites.  2.2 Communities' awareness and capacity enhanced to assess, plan and implement fisheries, aquaculture and livelihood adaptations to climate change risks.	LDCF	480,000	3,000,000
Component 3: Enhancing local adaptive capacity to support climate resilient fisheries and aquaculture management and alternative livelihoods in the face of climate change	INV	3. Communities with strengthened adaptive capacity maximize their incomes and access to nutrition through adoption of CC resilient fisheries, aquaculture technologies/and management systems in targeted areas.  <b>Indicators:</b> a) Number of pilot aquaculture farming/improved fishing technologies in place. b) Number of targeted groups implementing adaptation technologies. c) Number of women being directly involved in the implementation of improved farming systems/technologies.	3.1 Site specific climate resilient and gender differentiated fisheries, and aquaculture technologies (e.g. fisheries information platform, innovative aquaculture systems, broodbanks and satellite hatcheries, salt tolerant fish strains etc.) developed and adopted by the targeted communities.  3.2 Community-led and gender differentiated dissemination systems (e.g. pilot farms, training manuals) of adaptation technologies developed and adopted.  3.3 Innovative environmental monitoring and information tools for the communities to obtain and exchange information to improve resiliency and increase production in the fisheries and	LDCF	3,448,680	6,961,900

			aquaculture systems developed and implemented. 3.4 Manuals on climate resilient and gender differentiated fisheries, aquaculture and livelihoods technologies/developed and adopted by the communities, DoF and other relevant government and non-government entities.			
Component 4. Dissemination of best practices and lessons learned, monitoring and evaluation	TA	4.1 Project implementation based on results based management and application of project findings and lessons learned in future operations facilitated.	4.1 Lessons learned and best practices from the use of different CC resilient fisheries, aquaculture and livelihood technologies/ approaches documented and communicated to relevant wider stakeholders.  4.2 Project monitoring system operating providing systematic information on progress in meeting project outcome and output targets.  4.3 Midterm and final evaluation conducted.	LDFC	238,095	100,000
Sub-Total					5,166,775	14,461,900
Project management Cost (PMC) <sup>4</sup>					258,339	738,100
<b>Total project costs<sup>4</sup></b>					<b>5,425,114</b>	<b>15,200,000</b>

**C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)**

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
National Government	DoF	In-kind/cash	2,800,000
	DoE	In-kind	1,600,000
	MoEF	In-kind	1,300,000
	DoF-WorldFish	In-kind/cash	6,500,000
GEF Agency	FAO	In-kind/cash	3,000,000
<b>Total Co-financing</b>			<b>15,200,000</b>

**D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA(S) AND COUNTRY<sup>1</sup>**

GEF Agency	Type of Trust Funds	Focal Area	Country Name/ Global	Grant Amount (\$) (a)	Agency Fee (\$) (b) <sup>2</sup>	Total (\$) c=a+b
FAO	LDCF	Climate Change	Bangladesh	5,425,114	515,386	5,940,500
<b>Total Grant Resources</b>				<b>5,425,114</b>	<b>515,386</b>	<b>5,940,500</b>

<sup>4</sup> To be calculated as percent of subtotal

<sup>1</sup> In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table

<sup>2</sup> Indicate fees related to this project.

**E. PROJECT PREPARATION GRANT (PPG)<sup>5</sup>**

Please check on the appropriate box for PPG as needed for the project according to the GEF Project Grant:

	<u>Amount Requested (\$)</u>	<u>Agency Fee for PPG (\$)<sup>6</sup></u>
• No PPG required		
• (Up to) \$50k for projects up to & including \$ 1 million		
• (Up to) \$100k for projects up to & including \$ 3 million		
(Up to)\$150k for projects up to & including \$6 million	100,000	9,500
• (Up to) \$200k for projects up to & including \$ 10 million		
• (Up to) \$300k for projects above \$ 10 million		

FAO will request USD 120,000 in PPG resources, with an agency fee of USD 11,400 as detailed below.

**PPG AMOUNT REQUESTED BY AGENCY (IES), FOCAL AREA(S) AND COUNTRY(IES) FOR MFA AND/OR MTF PROJECT ONLY**

Type of Trust Funds	GEF Agency	Focal Area	Country Name/ Global	PPG (\$) (a)	Agency Fee (\$) (b)	Total (\$) c=a+b
LDCF	FAO	CCA	Bangladesh	100,000	9,500	109,500
<b>Total Grant Resources</b>				100,000	9,500	109,500

<sup>5</sup> On exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

<sup>6</sup> PPG fee percentage follows the percentage of the GEF Project Grant amount requested.

## **PART II: PROJECT JUSTIFICATION<sup>7</sup>**

### **A. PROJECT OVERVIEW**

#### **A.1.1. The global environmental problems, root causes and barriers that need to be addressed:**

##### **The fisheries and aquaculture sector in Bangladesh**

The fisheries and aquaculture sector in Bangladesh is extremely important for its contribution to poverty reduction, food, nutrition and livelihood security and export earnings. With over 400 species of fish and shrimps, total annual fisheries production of 3.12 million tonnes in 2011 (FAO, 2013<sup>8</sup>), the sector contributed 4.39% of the national GDP, 22.76% of net income from agricultural sector, and 2.46% of the export earnings of which 86% comes from farmed shrimp and prawns in 2012 (DoF, 2013<sup>9</sup>). The fisheries sector alone supports the livelihoods of 15.6 million people in aquaculture, fishing, and related activities. Over the last two decades there has been remarkable growth in aquaculture production due to the continuous strides of the government, private sectors, NGOs and donors in the areas of fish seed and feed production and grow-out technologies, capacity building, and extension services.

The annual production from aquaculture increased from 1.4 tonnes/ha in 1987-88 to of 3.4 tonnes/ha in 2009-10 (DoF, 2012)<sup>10</sup>. Carps (Indian major and exotic) are the major species-groups with contribution of over 62% of total aquaculture production in the country (total aquaculture production 1.52 million tonnes in 2011, FAO, 2013). There is still enough room for raising the average annual carp aquaculture production to over 5.0 tonnes/ha. Compared to carp aquaculture production, the annual production of coastal shrimp and freshwater prawns is still very low, ranging between 250 to 350 kg/ha and 500 to 600 kg/ha for giant tiger shrimp *Penaeus monodon* (local name: *bagda*) and giant river prawn *Macrobrachium rosenbergii* (local name: *golda*) respectively (DoF, 2012).

*Haors* and *beels* are local terms for low-lying natural depressions on a floodplain. There is no clear cut distinction between *haors* and *beels*; larger ones are called *haors* and smaller ones are *beels*. *Haors* are normally connected into the neighbouring river system but do not represent dead rivers. Most of the larger *haors* are located in the north-eastern region of Bangladesh covering about 1.99 million ha of area and accommodating about 19.37 million people (GoB, 2012<sup>11</sup>). There are about 373 *haors* in the north-eastern region (Sunamganj, Habiganj, Netrokona, Kishoreganj, Sylhet, Maulvibazar and Brahmanbaria districts) of Bangladesh covering an area of about 859,000 ha which is around 43% of the total area of the *haor* region. This north-eastern *haor* basin is known for its rich and diverse fisheries resources and is called as “mother fisheries” of the country and is considered to be the most suitable breeding and nursing ground of many indigenous fish species. The *haor* basin is known for its rich capture fisheries and various other non-fisheries wetlands resources that support the livelihoods of millions of rural poor. It comprises a wide variety of finfish including 143 indigenous and 12 exotic species along with several species of freshwater prawns. In 2010, the fish habitats in the *haor* basin produced about 432 thousand tonnes of fish, of which 73.7% is from by capture fisheries and the remaining 26.3% (114 thousand tonnes) is contributed by aquaculture. Nearly 20% of the total inland fish production of Bangladesh comes from the *haor* basin and this sector plays a vital in the national economy in general and the local economy.

<sup>7</sup>Part II should not be longer than 5 pages

<sup>8</sup> FAO. 2013. FishstatJ – FAO Fishery and Aquaculture Global Statistics, Version 2.0.0. Rome, FAO. (available at [www.fao.org/fishery/statistics/software/fishstatj/en](http://www.fao.org/fishery/statistics/software/fishstatj/en)).

<sup>9</sup> DoF (Department of Fisheries). 2013. Fish Week Compendium. Department of Fisheries, Ministry of Fisheries and Livestock. 144 pp.

<sup>10</sup>DoF (Department of Fisheries). 2012. Fish Week Compendium. Department of Fisheries, Ministry of Fisheries and Livestock. 132 pp.

<sup>11</sup> GoB (Government of Bangladesh). 2012. Master Plan of Haor Area. Volume 1, Summary Report. Bangladesh Haor Development Board, Ministry of Water Resources, Government of Peoples' Republic of Bangladesh, Dhaka, Bangladesh. 55 pp. (Available at <http://www.bhwdb.gov.bd/bhwdb/cloud/archives/2013/02/summary-report-vol-i.pdf>)

*Haor* is also considered as one of the richest common pool resources (CPR) in the water sector that provide livelihoods of thousands of poor households under different formal and non-formal access arrangements. The contribution of *haor* capture fisheries to the livelihood of the rural poor of the area is very significant. Although 2.59% of population in the *haor* basin is full-time fishers, over 65% of the households are engaged in fishing and related activities as part-time or subsistence fishers. *Haor* is also globally significant due to its habitat quality and quantity that provide home for wide range of globally significant migratory water fowls during winter. There are multiple perennial wetlands in the greater *haor* basin have been considered annual bird census sites by the relevant international communities. These wetlands have a rich wildlife community and include 257 species of birds, 40 species of reptiles, 29 species of mammals and 9 species of amphibians. Most of the important *haor* basins are also enriched by wetland plants and lowland plantation. The second Ramsar wetland site (Tanguar *haor*) of Bangladesh is located in the *haor* basin. Some other wetlands in the *haor* basin, declared by the government of Bangladesh as ecologically critical areas (ECAs), need immediate interventions to rejuvenate the ecosystem functions and integrity. The *haor* ecosystems is affected by the multiplicity of threats relevant to both climate and non-climate stressors.

In the *haor* basin, due to low-lying flooded basins, potential for aquaculture has not been effectively explored to its potential by key actors although 26.3% of total fish production is contributed by aquaculture (see above), while the capture fisheries though robust and rich, being degraded due to poor management that is largely dictated by the desire to make money as fast as the means for fishing enable and as far as the fishery resource allows. Compounding unsustainable fishing practices are the land-based practices that have increasingly silted the biodiverse wetlands and denuded protective swamp forests. The practices can often be traced to poorly designed policies such as faulty leasing systems that abet elite capture and overexploitation while removing any incentive for community-based management of fishery resources.

There is no specific or comprehensive study on climate change impact on the *haor* basins. However, projections made by the IPCC (Intergovernmental Panel on Climate Change) (4<sup>th</sup> assessment) for south Asia as well as other projections could be considered for the *haor* region for insight into climate impact, adaptation and mitigation (GoB, 2012).

The land use of south-western coastal zone is predominantly under aquaculture (shrimp, prawns and fish). Along the coastal saline prone area, alternative brackishwater shrimp (primarily *bagda*) and freshwater prawns (primarily *golda*) farming mixed with fish (mainly major carps and tilapia) have been the predominant land use which in the past (for around 30 years) were predominantly under rice farming. Over 80% rice paddies (in some places 100% crop lands) in the south-western coastal zone have been converted to shallow ponds to farm brackishwater shrimps.

Coastal aquaculture and capture fisheries in Bangladesh have high potential for income, livelihood/food & nutrition security, and export earning but suffer from lack of appropriate technology, increased incidences of disease, land & water use conflicts underpinned by policy constraints. In addition, climate change (CC) poses a new dimension of threat to fisheries and aquaculture systems all over the country which may arrest the growth in this sector if urgent attention is not paid and the appropriate action delayed.

### **Expected Climate Change impacts**

Bangladesh is located within the tropical cyclone zone and historically, the coast line is exposed to tropical cyclones and storm surges with consequent damage to crops and aquaculture systems. However, due to global climate change, the frequency of extreme events in the form of cyclones and storm surges is on the rise. Between 2007 and 2009, 5 tropical cyclones occurred in the Bay of Bengal (Sidr 2007, Nargis 2008, Rashmi 2008, Bijli 2009, and Aila 2009) that affected the country's coast in varying degrees. Under such unfavourable climatic conditions, coastal aquaculture productivity in Bangladesh is threatened to collapse if urgent robust adaptation measures are not implemented.

The increased frequency and intensity of climate extremes and slow onset events<sup>12</sup> puts additional pressure on coastal production (both aquaculture and agriculture) and extraction systems (fishing including collection of crabs and molluscs, and non-timber forest products from the mangroves). On one hand, the rapid onset of climate extremes (e.g., cyclones and storm surges) not only affect instantly the lives and livelihood assets of poor coastal households, but also have residual effects which keep affecting the communities over longer period. For example, cyclone Sidr (November 2007) instantly damaged the fish and shrimp ponds, agriculture, and fishing, while the cyclone-induced prolonged inundation by saline water damaged the ecology of ponds/*ghers*<sup>13</sup>, requiring more than two years to come back to normal productive levels. When the farmers were about to come out of the residual impacts of cyclone Sidr, then they were again hit by cyclone Aila (May 2009) which damaged their aquaculture and agriculture production potentials for several years. On the other hand, various slow onset climate-induced events remain as constant threat to the productivity of coastal aquaculture almost every year at varying extents. The progressive change of climate brings new threats and additional pressure on the existing problems to the livelihoods of poor communities. The following table shows the frequency of climate-induced threats to aquaculture in the south-western coastal zone of Bangladesh which the farmers alone cannot overcome unless a comprehensive adaptation program is launched.

Table 1: Climate related stressors affected aquaculture in south-western coastal zone over last five years

Climate Change induced threats	Impacts on aquaculture
2007, November: Super cyclone Sidr	Damaged over 80% fish and shrimp <i>ghers</i> and disrupted fishing operations
2008, September: Abnormally high tide and coastal flooding	Breached and overtopped coastal dykes and damaged a large number of fish/shrimp ponds/ <i>ghers</i>
2009, May: Cyclone Aila with high surge	Damaged 80-100% fish/shrimp ponds/ <i>ghers</i> and affected fishing operations
2009, August: Intense rain-based flooding	Flooded many fish/shrimp ponds/ <i>ghers</i>
2009, October: Post-monsoon drought	Heat stressed affected shrimps
2010, April-June: Pre-monsoon drought	High temperature affected pond/ <i>gher</i> ecology, heat stress affected shrimp growth
2011, August: Intense heavy rain-based flooding for about two weeks	Over 80% ponds/ <i>ghers</i> flooded and all fish and shrimps died due to sudden fluctuations of pond/ <i>gher</i> ecology
2012, January: Severe cold spell with dense fogs (around 10 days)	Affected <i>gher</i> ecology, increased diseases of fish/shrimps, inhibited fish/shrimp growths, and caused high mortality and loss of dyke crops

Source: CNRS (2012)

Visible climate related threats in the *haor* basin include increased frequency of flash floods and concomitant inundation of fish ponds and croplands, intense heavy rainfall-induced sedimentation, pre- and early-monsoon droughts, drying up of wetlands, and drainage congestions. The combined and cumulative impacts of these threats have serious bearings on the stability of fisheries and aquaculture systems, leading to an accelerated decline of the overall fish production. More frequent and violent early monsoon flash floods carry and deposit huge quantities of sand and gravel in wetlands leading to habitat degradation and loss of biodiversity (fish, water fowl, wetland vegetation), as well as reducing the productivity and carrying capacity of these ecosystems.

<sup>12</sup> sea level rise, erratic rainfall, prolonged droughts, increased events of rough sea weather conditions, shorter & warmer winters)

<sup>13</sup> In Bengali, the term '*gher*' means an enclosure that is designed for cultivation of shrimp and prawns. This is achieved by modifying existing rice fields, building higher dykes, and excavating a canal several feet deep inside the periphery to retain water during the dry season (Ahmed, 2013).

Climate change and climate variability are putting new challenges that local communities are finding difficult to adapt to and are putting their livelihoods at risk. In order to increase and sustain the fisheries and aquaculture production systems, urgent interventions are required to make the sector more resilient. The LDCF fund is sought to support government's efforts to address these additional and increasingly severe threats from climate change impacts to the fisheries and aquaculture sub-sectors.

### **Root causes and barriers to adapting to impacts of climate change**

Although Bangladesh is considered one of the most vulnerable countries to climate change, the level of understanding and capacity to assess, plan and implement fisheries adaptation to climate change impacts is still constrained due to lack of adequate knowledge, institutional capacity, and policy gaps. Moreover, common understanding of climate change is biased to extreme events like cyclones, storm surges, and flooding which undermine the threats associated with the slow onset of climatic events on socio-ecological systems. These slow onset of climatic events appeared to have created greater impacts on fisheries and aquaculture systems than that of "one off" climate extreme events, as acknowledged by the recent UNFCCC (2012) report on regional experts meeting on loss and damage due to CC. The following are the key barriers to adapting to climate change in the fisheries sector:

- **Deficiency in policy and processes.** National fisheries and aquaculture policies focused on adoption of technologies to enhance productivity, livelihood security, and export earnings but lacked attention to climate change threats that can significantly affect the chance of the policy achieving its goals.
- **Lack of coordination among relevant government agencies.** Although inter-ministerial coordination is explicitly mentioned in the policy, coordinated management of fisheries has not been achieved on the ground. Since climate change impacts cut across various relevant sectors and agencies, a coordinated approach to design and implement adaptation interventions with defined roles and responsibilities is essential for ensuring effective and sustainable adaptation measures. Establishing a functional/working relationship and data sharing with Meteorological department and Flood Forecasting Centre of Bangladesh Water Development Board (BWDB) is also a requirement for disaster early warning dissemination on fisheries. Such linkages are inadequate now.
- **Limited knowledge and capacity to respond to CC impacts.** The government, through its Comprehensive Disaster Management Programme (CMDP-II) has taken up initiative to establish a Climate Change Cell (CCC) at Department of Fisheries (DoF). But formation of a cell in the DoF does not guarantee outcomes in the long run unless such structure is recognized in the strategy and gets continuous support to retain competent manpower, necessary logistics, equipment, and required funds. Climate change adaptation planning is complex as it requires forward looking scenarios while planning adaptive measures and long term reliable database is required for trend and impact analyses. Currently DoF does not have such information and thus assessing impacts of CC on fisheries is difficult. Data from the Meteorological office is accessible, but synchronizing the climate data with site specific fisheries data would be a difficult task for the DoF officials who lack training and reliable fisheries datasets.
- **Lack of CC resilient fisheries and aquaculture technologies.** This is one of the most important barriers. Although the CC induced impacts are visible in the country and concerned communities experiencing loss and damages due to CC impacts, suitable fisheries and aquaculture technologies resilient to variable climate change induced stressors are not there and those that are known are not yet to be supported for extension. As discussed earlier, slow onset climate related perturbations is seriously affecting the coastal aquaculture farmers in the south-west part of the country. This means that fishers and fish farmers can periodically lose

their assets and need to start back from zero. Women are very often specially affected since they have even less access to new technologies or improved seeds etc. Even though aquaculture represents a new opportunity and a potential adaptation option for rural communities no access to adequate farming systems and technologies does allow the realization of such potential.

- **Lack of information services to communities.** Currently there is no formal and effective information dissemination (or support) system functioning in the fisheries sector. The existing disaster early warning systems does not disseminate any fisheries and aquaculture related information to communities living in the coastline, except for disaster signals for sea going vessels.

The following table provides a summary of the key barriers, their underline causes, and the key measures needed to be undertaken to address these barriers.

**Table 2: Barriers, causes and measures to address barriers**

Barriers	Causes	Key measures to address barriers	Project components to carry out the measures
Lack of climate compatible fisheries and aquaculture policies and strategies impede the MoFL and DoF to tackle impacts of CC on fisheries sector development.	<p>Deficiency in policy and processes;</p> <p>Lack of coordination among relevant government agencies;</p> <p>Lack of monitoring and feedback systems on CC impacts on fisheries and aquaculture system within the DoF, from national to local levels.</p>	- Enabling national fisheries (including aquaculture and shrimps) and related policies and strategies and enhanced capacity that foster transformative fisheries adaptation and development not only within the MoFL/DoF but also among other relevant government and private agencies.	1. Climate resilient fisheries sector and relevant national capacity development.
DoF, local governments and relevant stakeholders on the ground have limited capacity to respond to climate related stressors and fisheries adaptation to CC impacts.	<p>Limited knowledge and capacity to respond to CC impacts;</p> <p>Lack of information services to communities;</p> <p>Lack of monitoring and feedback systems on CC impacts on fisheries and aquaculture system within the DoF, from national to local levels.</p> <p>No access to appropriate technologies and improved farming and fishery systems</p>	- Strengthening the capacity of local communities including field level sop that DoF and other relevant agency staff to the extent they can assess, plan and identify adaptive measures to reduce climate change risks.  Promotion of appropriate technologies and approaches including information based on specific different sensitive ecological settings of the country that enhance fisheries and aquaculture productions and community livelihoods in the face of climate change	<p>1. Climate resilient fisheries sector and relevant national capacity development.</p> <p>2. Strengthening knowledge and awareness of fisheries/aquaculture dependent communities facing the adverse impacts of climate change.</p> <p>3. Enhancing local adaptive capacity to support climate resilient fisheries and aquaculture management and alternative livelihoods in the face of climate change</p>

<p>The relevant fisheries and aquaculture dependent communities lack understanding on the issues of climate change and their impacts on fisheries and aquaculture and its consequent effects on their livelihoods.</p>	<p>No access to CC related information Lack of information and early warning services to communities;</p>	<p>impacts.</p> <ul style="list-style-type: none"> <li>- Strengthening the capacity of local communities including field level DoF and other relevant agency staff to the extent they can assess, plan and identify adaptive measures to reduce climate change risks</li> <li>- Promotion of appropriate technologies and approaches including information based on specific different sensitive ecological settings of the country that enhance fisheries and aquaculture productions and community livelihoods in the face of climate change impacts.</li> </ul>	<ol style="list-style-type: none"> <li>2. Strengthening knowledge and awareness of fisheries/aquaculture dependent communities facing the adverse impacts of climate change.</li> <li>3. Enhancing local adaptive capacity to support climate resilient fisheries/aquaculture management and alternative livelihoods in the face of climate change.</li> </ol>
<p>The current EWS in Bangladesh does not provide specific messages for the farmers (aquaculture and agriculture) as to what preparedness measures should they take to protect their fish/shrimp farms or croplands from CC induced disasters nor they disseminate specific messages on slow onset events such as drought, sea level rise, salinity, erratic rainfall, temperature rise, cold spells, etc.</p>	<p>EWS largely focuses on maritime aspects and sea safety, only during climate extreme events (cyclonic, flooding).</p> <p>DoF does not collect, maintain database on various climate factors that affect/ influence the fisheries and aquaculture production systems viz. salinity, drought, rainfall, water flow, temperature to respond to climate related stressors and fisheries adaptation to CC impacts.</p>	<ul style="list-style-type: none"> <li>- Promotion of more resilient and appropriate technologies including information based on specific different sensitive ecological settings of the country that enhance fisheries and aquaculture productions and community livelihoods in the face of climate change impacts.</li> </ul>	<ol style="list-style-type: none"> <li>1. Climate resilient fisheries sector and relevant national capacity development.</li> <li>2. Strengthening knowledge and awareness of fisheries/aquaculture dependent communities facing the adverse impacts of climate change.</li> <li>3. Enhancing local adaptive capacity to support climate resilient fisheries/aquaculture management and alternative livelihoods in the face of climate change.</li> </ol>

## 1.2 Baseline scenario and associated baseline projects

The Government of Bangladesh (GoB), through a number of projects, provides guidance and support to aquaculture and fisheries efforts that have a partial contribution to adaptation to climate change and climate variability. These initiatives and baseline projects are described below.

**1. Aquaculture and Fisheries Management Project in Haor Area** – The Department of Fisheries (DoF) is implementing a 4-year long project (2010-2014) in the *haor* basin with funding from the GoB own resources at the tune of US\$ 1.6 million. The project has two pronged objectives i) to improve socioeconomic status of the poor fishers and fish farmers in remote *haor* areas through building capacity and creating income earning opportunities, and ii) to increase fish production and other natural biodiversity in selected *haor* areas through activities like rehabilitation of wetlands, establishment of fish sanctuaries, establishment of floodplain (*beel*) nurseries, stocking of carp fingerlings, implementation of fish acts, etc. The project has plan to reach 20,000 fishers and 5,000 aquaculture farmers over a period of 4 years and help build their capacity through providing training and technical supports to improve fisheries and aquaculture management including diversifying their income options. However, this project lacks focus on climate change impacts on fisheries and aquaculture. Additionally, development and application of technologies for CC resilient fisheries and aquaculture management at the field level is not enough to sustain the sectors growth unless equal focus is given to build the national capacity including improvement of related national policies and strategies which this current GoB project not addressed.

**2. Community Based Sustainable Management of Tanguar Haor Programme** - The Ministry of Environment and Forests (MoEF) through IUCN and partners NGOs in association with district administration has been implementing a project entitled “*Community Based Sustainable Management of Tanguar Haor Programme*”, a Ramsar site in the *haor* basin under Sunamganj district with support from the SDC since 2007 in phases. Currently the project is in its third phase to be implemented over a period of three years starting from July 2012 (US\$ 1.9 million). The goal of the project is to put in place a co-management system for the Tanguar *haor* (TH) Ramsar site which conserves ecosystem values and services and provides a basis for an improvement of livelihoods for rural communities. Tanguar *haor* is a unique wetland ecosystem of international and national significance covering some 10,500 hectares. It provides subsistence and livelihoods to some 60,000 people living in 88 villages within the TH Ramsar site on its periphery. The site plays a critical role as mother fishery for the entire *haor* basin spans over seven north-eastern districts of Bangladesh. The current phase of the project seeks three outcomes. The first outcomes aims for consolidating effective co-management system in TH through building capacities of the stakeholders to actively participate in the management framework, determining sustainable resource harvesting levels, combating illegal uses of natural resources, and promoting livelihoods. The second outcome focused on livelihoods enhancement, training, access to livelihood opportunities, value chain analysis and market access plan for four economic areas (fisheries, agriculture, livestock, and handicrafts) and organize access and control rules for benefit sharing from the use of reeds and forests. The third outcome focused on long term sustainability of co-management systems.

**3. Community-based Adaptation to Climate Change in Ecologically Critical Areas (CBA\_ECA)** - Department of Environment (DoE), Government of Bangladesh has been implementing a 4-year long project in the Hakaluki *haor* in the *haor* basin with focus on ecosystems based adaptation to climate change since 2011. The project is funded at the tune of US\$ 2.47 million from the climate change trust fund (CCTF) of the government under the technical support of UNDP<sup>14</sup>. Key activities of this project include raising awareness of local communities; assessing community risks and vulnerability to climate change; enhancing communities’ capacity for climate change adaptation and biodiversity conservation; CC resilient agriculture and horticultural practices, conservation of freshwater swamp forests, and protection of human settlements from wave erosion creating micro level green belts. The project’s major biodiversity conservation activities include wildlife conservation, swamp forest restoration, establishment of fish sanctuaries and enforcement of relevant laws for protection of biodiversity and habitats. The project provides micro capital grants and training

---

<sup>14</sup> It is noted that UNDP shared 25% of the project costs mainly in the area of technical assistance.

to communities to create alternative income/livelihoods sources to reduce their vulnerability to climate change and reduce their dependency on natural resources. The project however, lacks focus aquaculture and relevant capacity building of aquaculture dependent communities to adopt climate resilient aquaculture practices and this will be a major added value of the current LDCF project. The project also lack focus on national capacity building targets including improvement of relevant national policies and strategies to incorporate CC issues & impacts on fisheries, wetlands, and biodiversity.

**4. Feed the future Aquaculture project** - Currently in coordination with the DoF, WordFish (WF) is implementing a 5-year long USAID<sup>15</sup> funded (2011-2016) project fisheries project titled '**FTF Aquaculture**' in 20 south-western coastal districts (US\$ 5.0 million). The project has four components. Under component one – it delivers improved quality and/or genetically improved lines of tilapia, carps, prawns and shrimps seeds to aquaculture farmers, providing the basis for fish yield improvements of 12-27% for ponds and *ghers* in the southern delta, benefiting around 721,672 farm households. The project is supporting government centers and private hatchery operators to source quality broodstock, establish management systems to maintain and develop quality lines, and to accelerate distribution of improved strains of fish and shrimps to farmers across the southern region. The project also delivers improved nutrition and incomes through aquaculture and horticulture to poor and vulnerable households through demonstrating improved aquaculture technologies, training, and communication programs. Nutrition education and promotion of Vitamin A rich orange fleshed sweet potato cultivation and production of indigenous nutrient-dense fish species is also promoted. The project also facilitates collaboration with project partners to stimulate investment, employment and incomes in the southern region. The project plans to work with around 100,000 shrimp and prawn farmers, and 20,000 entrepreneurs in high-value commercial fish culture. Culture of salt tolerant commercial aquaculture species is also promoted. The project also focuses on policy and regulatory reforms and institutional capacity building within public and private sectors. It helps improving the capacity of private sector associations and business, and assist both public and private bodies to be more actively engaged in managing the project including support for improvements in the collection of fisheries statistics in collaboration with the World Bank. Adoption of new policies that stimulate growth and investment of the sector - e.g. mandating Polymer Chain Reaction (PCR) testing for all shrimp post larvae (PL) – is being pursued, in cooperation with IFPRI.

**5. Aquatic Agricultural Systems (AAS)** – This 5-year long CGIAR research program (2012-2016) on Aquatic Agriculture System (AAS) in Bangladesh being implemented by WorldFishin association with DoF and DAE aiming at “improving the well-being of aquatic agricultural system-dependent peoples” (US\$ 9.77million). The program is being implemented in different geographical areas of the country having specific sets of problems and opportunities for development (viz. Greater Mymensingh<sup>16</sup>, Haor basin - Greater Sylhet<sup>17</sup>, Greater Khulna<sup>18</sup>, Greater Barisal<sup>19</sup> and Greater Noakhali<sup>20</sup>/Comilla<sup>21</sup>). The program sites crosscut with the proposed LDCF project sites in greater Sylhet (NAPA priority fisheries intervention # 13) and greater Khulna, greater Barisal and greater Noakhali areas (NAPA priority fisheries intervention # 14). This research program focuses on:

- Enhancing sustainable aquatic agricultural systems' productivity and thereby benefiting AAS dependent households;
- Creating improved and enabling markets for the small holders AAS-producers;
- Strengthening resilience and adaptive capacity of vulnerable poor and marginalized communities;

<sup>15</sup> United States Agency for International Development

<sup>16</sup> The greater Mymensingh consists of six districts: Jamalpur, Kishoreganj, Mymensingh, Netrakona, Sherpur and Tangail.

<sup>17</sup> The greater Sylhet consists of four districts: Habiganj, Maulvibazar, Sunamganj and Sylhet.

<sup>18</sup> The greater Khulna consists of three districts: Bagerhat, Khulna and Satkhira.

<sup>19</sup> The greater Barisal consists of five districts: Barguna, Barisal, Bhola, Jhalokati, Patuakhali and Pirojpur.

<sup>20</sup> The greater Noakhali consists of three districts: Feni, Lakshmipur and Noakhali.

<sup>21</sup> The greater Comilla consists of three districts: Brahmanbaria, Chandpur and Comilla.

- Reducing gender disparities in access to and control over resources and decision making spaces;
- Improving policy and institutional structure and processes to support pro-poor, gender equitable sustainable development; and
- Creating relationships, partnerships and networks for knowledge sharing and sustained development outcomes.

This research program will incorporate lessons from various other similar projects/initiatives in the country including an innovative CC adaptation piloting entitled “smart farm” project now being implemented in four south-western coastal districts of Bangladesh by the WorldFish for wider application at landscape level in different climate sensitive areas. However, this project has emphasized more on the agricultural systems rather on the well-being of fishing communities and coastal aquaculture-dependent households. This project also lack policy component to improve the fisheries and related policies by incorporating CC issues.

### **A.1.3 The proposed alternative scenario, with a brief description of expected outcomes and components and the project**

In alignment with the priorities as identified in NAPA, the proposed project requests the LDCF to finance additional costs aiming to facilitate climate resilient fisheries sector development in Bangladesh. The project intends to build adaptive capacity of vulnerable fisheries and aquaculture dependent communities to climate change impacts in two priority sites (south-western coastal zone and deeply flooded *haor* basin in the northeast) (Table 3) that are highly exposed to climate change induced perturbations through the promotion of climate resilient fisheries, aquaculture and livelihoods technologies/approaches including relevant institutional capacity and policy improvements covering both central level and local level.

**Table 3. Two priority sites where the project activities are to be implemented**

**South-western coastal zone: 14 districts under Khulna, Chittagong and Barisal divisions**

Divisions	Districts
Barisal	Barisal, Bhola, Barguna, Patuakhali, Jhalokati and Pirojpur
Chittagong	Chittagong, Cox’s Bazar, Noakhali and Feni
Khulna	Khulna, Bagerhat, Satkhira and Jessore

**Haor basin in north-eastern region: 7 districts under Sylhet and Dhaka divisions**

Divisions	Districts
Chittagong	Brahmanbaria
Dhaka	Kishoreganj and Netrokona
Sylhet	Sylhet, Sunamgonj, Habigonj and Moulvibazar

In this context, the project will design and implement appropriate site specific adaptation interventions leading to build the capacity of fishers and aquaculture dependent communities by adopting climate compatible technologies and livelihood options and use of ICT based climate and disaster information services underpinned by enabling national policy environments and institutional arrangements. The project has three components collectively aiming to achieve resilient fisheries sector development in Bangladesh, comprise the following incremental activities:

#### ***Component 1: Climate resilient fisheries sector and relevant national capacity development***

*Current situation and remaining obstacles:*

Over the last two decades fisheries and aquaculture productions have increased to a great extent as a result of continuous undertaking of efforts by the government, donors and NGOs. This achievement is in alignment with the goal of the national fisheries policy (1998) which emphasized on increasing fisheries production to ensure food security and employment/livelihood generation for the millions of poor people dependent on this fragile and climate sensitive sector. Fisheries sector is highly sensitive to climate stimuli and is affected negatively by the impacts of climate change. It is urgent to develop capacities of DoF and other relevant government agencies and private sectors to make the sector climate resilient. As per the national fisheries policy, in the current mandate of DoF, there is no activity on monitoring and analysis of climate attributes, analysis of trends, annual variability and their impact on specific fisheries production systems (capture and culture fisheries) which refrained the DoF to develop climate compatible programs and actions.

The national fisheries policy developed 14 years back did not have any focus on climate change issues thus no policy directives are there as to how to make the sector climate resilient to sustain the production systems and livelihoods of the dependent communities. Non-inclusion of CC issues in policy might have been due to less knowledge on the links between CC and fisheries in late nineties. The traditional planning system does not allow the DoF to develop field-based participatory planning with the participation of relevant communities and stakeholders. Currently the fisheries programs and projects are planned centrally and implemented locally through the district and sub-district level officials at the community level. Presently, all line of program planning, implementation and monitoring sections of the DoF including the communities lack understanding and capacity to adopt climate smart fisheries programs. The DoF though made remarkable progress in production enhancement technologies and options but they equally lack capacity and actions to address the climate change issues. The current “business as usual” focus of the DoF in increasing aquaculture production will not be sustainable in the long run in an age of climate change unless a comprehensive fisheries adaptation program with clear incorporation climate change issues in fisheries policies, strategies and action plans are developed and make operational.

*Adaptation benefits provided by the current proposal:*

With LDCF funding, DoF will build their capacity to address climate change risks to fisheries and aquaculture production systems. The key aspect of capacity building will include training and engagement of DoF central and field staff in climate change impact assessment on fisheries. Other activities may include demonstration and pilot testing of climate change impact assessment, risk mitigation and adaptation. Under the proposed project, DoF will carry out a national level assessment of climate change-induced risks to fisheries and aquaculture sub-sectors with focus on the country’s climate sensitive areas (as described in Table 3) jointly with relevant competent agencies (eg. Bangladesh Fisheries Research Institute, BFRI). Bangladesh, due to its geographical locations and spatial ecosystems/landscape diversities is exposed to differentiated impacts by the climate-induced threats. Some broader ecosystems of the country have been identified as highly sensitive to climate change stimuli (saline coastal zone, deeply flooded *haor* basin, central floodplains, drought prone Barind tracts, Sundarbans mangrove ecosystems, Chalan *beel*, etc.) (NAPA, 2005). The assessment will give due considerations on gender issues and generate gender disaggregated data and information on climate change risks in the fisheries/aquaculture sector by applying standard tools. The assessment will inform the current and potential impacts of climate change on fisheries sector and to sensitize such agencies towards incorporating climate issues in the existing national fisheries policies and strategies. This in turn will facilitate making the current fisheries strategies climate resilient including incorporation of appropriate adaptation measures in ongoing development activities in the sector.

Results of diverse ecosystems level assessment of selected climate sensitive areas (component 1) and in project sites (to be conducted under component 2) will collectively contribute to influence the policy stakeholders of the adverse impacts of climate change and climate variability on fisheries and aquaculture. These outcomes will pave the ways to fisheries sector policy improvement and shape the institutional arrangements/coordination towards making them climate resilient. One of the key contributions of outputs of this component will be to improve /update national fisheries, shrimp and other relevant policies and strategies that are yet to make climate resilient through the incorporation of

CC issues in fisheries development. The assessment outcomes will also leverage activities under component 3 of this project in developing gender sensitive climate compatible fisheries technologies/ options and action plans for the coastal and *haor* regions.

With a view to enhance the national capacity, this component will take up actions to strengthen the Climate Change Cell (CCC) being formed at the DoF with support of CDMP-II. Key members of the CCC will be trained (in-country and overseas) on climate change issues and its impacts on fisheries sector including methods for assessing, planning and implementing and monitoring climate compatible fisheries development of the fisheries sector in the country. Besides DoF officials, staff members of other relevant government agencies and private sectors (including NGOs) will be trained on CC resilient fisheries and aquaculture development under this component. This will leverage DoF's effort in CC resilient fisheries sector development in Bangladesh. The capacity development of the DoF will lead the Cell to transform the fisheries sector activities more climate compatible and sustainable. Staff members of CCC at the DoF will carry out the national and project level assessment of climate change risks & vulnerability to fisheries sector. Competent relevant institutions and partners (e.g. FAO, BFRI, relevant universities imparting CC education, WorldFish) will provide technical backstopping to DoF in strengthening the CCC and building technical capacity of relevant staff members to assess, plan, implement and monitor climate change adaptation projects/ activities in fisheries sector.

The staff members of CCC at DoF, with support from FAO and WorldFish, will review/ analyze current fisheries and other relevant national development policies and strategies, analyze gaps, and suggest improvement by incorporating lessons from the project that would cater climate resilient fisheries in Bangladesh. The climate smart national fisheries strategies will create space for gender dimensions with explicit provisions for specified roles, responsibilities, scopes and budgets. The core team will develop policy briefings and hold high level policy dialogue towards developing national climate resilient fisheries sector policy and allocating budgetary provision in fisheries sector planning.

### ***Component 2: Strengthening knowledge and awareness of fisheries/aquaculture dependent communities facing the adverse impacts of climate change***

#### *Current situation and remaining obstacles:*

The current capacity and knowledge base of the DoF both at the central and field levels is inadequate to affectively assess and quantify the specific impacts of various climate change stimuli on fisheries and aquaculture systems. Communities at the field level are being increasingly affected by the climate change-induced shocks but are unable to take any measure to overcome due to poor understanding of the issue. Thousands of shrimp *ghers* and fish ponds and livelihoods of relevant households are being affected annually by various climate related stressors (higher temperature, erratic rainfall, drought, cold spells, cyclones, flooding, sea level rise, salinity, etc.) and committed loss of income, livelihoods and nutrition but are supported with technologies due to knowledge gaps. The climate change threats outweighing the contribution of fisheries and aquaculture sub-sectors in poverty reduction, employment generation, and improved nutrition in a population dense country like Bangladesh.

#### *Adaptation benefits provided by the current proposal:*

This component will increase and strengthen awareness, knowledge and skills development of local communities and relevant stakeholders on the adverse impacts of climate change affecting the fisheries and aquaculture systems including livelihoods of the dependent communities. The project participating communities will be trained and engaged in detailed understanding of climate change impacts and vulnerability to fisheries and aquaculture including their livelihoods at the project sites (e.g., coastal zone and *haor* basin) to generate adequate information and knowledge on the pathways of climate change-induced impacts. This site level community assessment will generate data on the current knowledge, attitude and practice (KAP) of project communities with direct involvement of men and women. The analysis of knowledge gaps in understanding and response to climate change

risks on fisheries, aquaculture and on livelihoods will form the basis for designing appropriate long term integrated adaptation actions for the areas. On the other hand the project should use the local knowledge and understanding of climatic variability. Outcomes of this assessment will also contribute / supplement national capacity development and policy improvements (component 1) as well as designing site specific adaptation interventions (component 3) with the full participation of the local communities and relevant stakeholders.

A comprehensive awareness and skill development activity packages will be developed that will address the needs and demands of local communities to become critically aware to get self-prepared to tackle the climate change impacts in their respective sites. Training, awareness campaign, exposure visits, folk drama, TV fillers, use of ICT services, etc. will be the key tools for awareness and capacity building of the targeted communities including DoF and other government and non-governmental agency field personnel. To this end, experience of ongoing LDCF project on “community-based adaptation to climate change through coastal afforestation” will be instrumental for taking up similar approaches and activities in the sites of this proposed project.

Vulnerable poor men, women and youth involved in aquaculture and fisheries for their livelihoods will be the key audience of training and awareness building activities under this component. The training programs will be tailored to fit in to the needs of specific social and occupational groups within the fisheries sector viz. separate packages for aquaculture farmers for coastal and *haor* regions, separate focus on men and women and their livelihood involvement in different hierarchies of coastal region and *haor* basin fisheries and aquaculture systems. Apart from making the existing early warning systems (EWS) giving messages to fishers and aquaculture farmers on disasters, this component will develop an ICT based information dissemination systems in project sites through which the project communities will get technical messages on actions to be taken to address risks of CC on fisheries and aquaculture production systems. The project will leverage activities of other entities working on early EWS jointly with the Meteorological Department, CDMP-II, Community Radio Operators and mobile phone operators to inform and aware the project communities to take preparedness measures against potential climate related hazards.

### ***Component 3: Enhancing local adaptive capacity to support climate resilient fisheries/aquaculture management and alternative livelihoods in the face of climate change***

#### *Current situation and remaining obstacles:*

Communities live in the environmentally fragile areas suffer the most due to climate change impacts. Of the different climate sensitive areas of Bangladesh, coastal and *haor* regions (see Table 3) are more exposed to multiple climate change stimuli than others. These two areas/ecosystems are also rich in having fisheries and aquaculture resources upon which majority of the poor households depend for their livelihoods. The fisheries in the coast are more aquaculture-based including salt water shrimp farming in *ghers* in the dry season mixed while fish and alternatively prawn-white fish culture in monsoon months. Majority of coastal farmers have been repeating the same old traditional and extensive technologies in coastal aquaculture which is not resilient to climate change risks resulted in crop failure to varying extents has been a common phenomenon in the local areas. The technologies applied through baseline projects as described in section A 1.2 of this PIF focused more on production enhancement without paying proper attention to address CC threats. The current planning processes in most government agencies including the DoF are top down. The local communities thus remain disconnected from the ground level problem census and planning processes that exclude the ground reality and challenges to be incorporated in development planning. This disconnectedness results in practicing “business as usual” technologies and approaches which often fail to produce the desired outcomes which being furthered worsened by the effects of climate change. Similar situation exists for the *haor* regions (low lying flooded basin) where capture fisheries-based livelihood is pre dominant due to its hydrological regimes and flooding characteristics where planning focused more on flood control and infrastructure development with lesser focus on livelihoods, natural resources management and fisheries & aquaculture development alternatives due to flooding problems.

The fisheries management and aquaculture technologies including livelihood options developed and being practiced by DoF and other actors over the last two decades though facilitate increasing productions, but are not sustainable due to the impacts of climate change and climate variability. Livelihoods of poor households in both the sites are largely fisheries, aquaculture and agriculture-based technologies but most of which are not very resilient and climate variation/climate change compatible. Scope for utilizing vast patches of lands in the coastal area remains fallow in winter/dry season due to higher soil and water salinity. Extension of the practice of saline tolerant rice varieties, vegetables, horticulture and aquaculture could have been best choices for the affected households to have sustained livelihoods in the coast but this has not been properly explored and put in place as yet. Coastal communities continue to practice traditional high yielding rice monoculture, use of freshwater carps and tilapia as major sharers in coastal aquaculture with shrimps and prawns.

#### *Adaptation benefits:*

This component offers the most relevant “on the ground” adaptation benefits. It seeks to enhance the adaptive capacity of fisheries and aquaculture dependent communities in two NAPA priority intervention sites through adoption of climate resilient technologies and better management.

Under this component, site specific fisheries and aquaculture adaptation technologies/ options will be designed based on the participatory and community based assessment of climate change impacts on fisheries and aquaculture and lessons learned from previous and ongoing development projects. Some of the key aquaculture adaptation interventions may include the introduction of saline tolerant (viz. tilapia, mullet, and Asian seabass) and stress tolerant short cycled fish species through pilot demonstration facilities and enhanced adoption of the new technologies. This will include improved shrimp aquaculture farming systems, cage and pen aquaculture, mud crab fattening, etc. Other technological investment options include the improvement of existing brood banks and the establishment of climate resilient satellite hatcheries in collaboration with local farmers. Such investments should improve the production of more adapted fish/shrimp seeds and the quick provision of seeds as a response to emergencies. Improved hatcheries and satellite hatcheries will also provide seed for a culture based-fisheries (CBF) program strongly based on community consultation and using risk assessment to decide on the species, sites and management. This could become a major “technological” improvement for sustainable and more resilient capture fisheries. Other relevant investments may include wetland habitat restoration, wetland/fish sanctuaries, swamp forest restoration, adoption of wise use principle in fishing (viz. pile fishery systems<sup>22</sup>) in combination with CBF water conservation systems in the dry season, critical fishery habitat mapping using GIS technologies, etc. Besides, aquaculture and fisheries management interventions, this component will also explore CC resilient livelihood options for the fisheries and aquaculture dependent communities based local situations (saline and drought tolerant rice varieties, crop diversification, bee keeping, pigeon farming, etc.). However, detailed options for site specific fisheries and aquaculture adaptation interventions and technologies will be developed during the PPG phase through participation of local communities in project sites, DoF officials and other relevant stakeholders based on local social-ecological and climatic conditions.

This component also includes the development of community based gender differentiated dissemination systems through the develop of pilot farms, e.g. backyard ponds where women can use better quality fish larvae to increase production and access to food. Communities will also develop a follow up monitoring system for the innovation technologies. Local level formal and informal CBOs (community-based organizations - self organized and project driven) including extreme poor households dependent on fisheries and aquaculture will be engaged as the primary participants in project planning, implementation and monitoring of adaptation alternatives.

Efforts will be made to implement adaptation options under the ecosystem approach to fisheries and aquaculture (EAF/EAA) to ensure long term sustainability by addressing social, environmental and

---

<sup>22</sup> Fishing in selected wetlands switching after three years in order to conserve and maintain sustainable fisheries stock in nature, this was widely practiced earlier in *haor* basins

governance objectives in the development of more climate resistant management plans. For example by reducing exposure in aquaculture through better site selection process for cage and pen culture, so risk maps will be developed to guide the aquaculture zoning and siting etc.

Innovative environmental monitoring system that can be connected to DRM, early warning and improved management of aquaculture and fishery resources will be implemented. This will include the introduction and adoption of simple monitoring tools for water quality and establishing information platforms for the communities to obtain and exchange data and knowledge to improve resiliency and increase fish production.

The activities under this component will also address the potential impacts of climate change including lessons learned from various recently completed and ongoing projects on fisheries and aquaculture management including livelihoods development, disaster risk reductions and market linkage development aiming to climate change adaptation. To this end, lessons from various past (viz. management of aquatic ecosystems through community husbandry-MACH) and ongoing projects viz. Community-based Tanguar *haor* Ramsar site management, Community-based Ecologically Critical Area (wetlands) management, Integrated Protected Area Co-management (IPAC) will be considered for, customizing and demonstrating in selected project sites.

#### ***Component 4: Dissemination of best practices and lessons learned, monitoring and evaluation***

This component will be fully discussed and designed during the PPG phase through broad consultation with partners and relevant stakeholders and following a log-frame approach. The current situation without project will provide the baseline to design proper indicators of the advancement of the project as well as a system to provide information and communicate the outputs and outcomes. The mid-term evaluation will involve rapid assessment tools to facilitate addressing gaps and issues that may arise and to reshape activities and road map as needed in a participatory mode.

Important project lessons on adaptation technologies/ approaches/ options have potential to contribute enhancing adaptive capacities not only in the fisheries sector within Bangladesh but also in other relevant sectors both within the country and beyond will be archived. Through this component, the LDCF funds will be used in documentation, dissemination and uptake promotion of project lessons to wider communities including policy stakeholders through developing appropriate communication strategy, media and tools.

#### **A.1.4 Incremental cost reasoning and expected contributions from the baseline, the GEFTE, LDCF/SCCF and co-financing;**

Increasing fisheries output especially from aquaculture sector is expected through technological innovations and improved management practices in fish seed production, grow out technologies, use of extension tools and availability of information and fish farming inputs through a number of the mentioned baseline projects however the proposed LDCF comes to build on these and address the gaps and a coherent approach to CC adaptation.

#### ***Component 1: Climate resilient fisheries sector and relevant national capacity development***

Few baseline initiatives are there to support the strengthening of the fisheries institutions on climate change aspects, however a few of them are relevant as baseline to this component

##### **Baseline:**

-A government initiative; **CDMP-II** (Comprehensive Disaster Management Programme) has taken up to establish climate change cell (CCC) at DoF. Although this is a very important effort, the formation of a cell in the DoF does not guarantee outcomes in the long run unless such structure is recognized in

the strategy and gets continuous support to retain competent manpower, necessary logistics, equipment and required funds. The climate change cell (CCC) at the DoF may not sustain beyond the period of CDMP support unless relevant capacity is built and charter of duties are allocated through the National fisheries policy and strategy which is now lacking in the current policy directives.

-The **Feed for the future project** has a component that focuses on policy and regulatory reforms and institutional capacity building within public and private sectors to help improving the capacity of government, private sector associations and business, and assist both public and private bodies to be more actively engaged in managing production systems and the project itself including support for improvements in the collection of fisheries statistics.

**With LDCF funding, DoF will** build their capacity to address climate change risks to fisheries and aquaculture production systems. The key aspect of capacity building will include training and engagement of DoF central and field staff in climate change impact assessment on fisheries and aquaculture. Under the proposed project, DoF will carry out a national level assessment of climate change-induced risks to fisheries and aquaculture sub-sectors with focus on the country's climate sensitive areas jointly with relevant competent agencies.

***Component 2: Strengthening knowledge and awareness of fisheries/aquaculture dependent communities facing the adverse impacts of climate change***

**Baseline:**

-The **Community-based Adaptation to Climate Change in Ecologically Critical Areas** by the Department of Environment (DoE), Government of Bangladesh being implemented in the Hakaluki Haor basin with focus on ecosystems based adaptation to climate change includes raising awareness of local communities, assessing community risks and vulnerability to climate change, and enhancing capacity for climate change adaptation and biodiversity conservation. Because the project lacks focus on aquaculture and relevant capacity building of aquaculture dependent communities the proposed LDCF project will provide this added value. Also the implementation of an ecosystem approach to aquaculture (EAA) can be a most relevant addition to the current efforts of this base line project

**The proposed LDCF** project will strongly address increased fisheries and aquaculture knowledge and awareness both at local level through focus and targeted training to fishermen, fish farmers and consumers with strong gender consideration and the managers related. The analysis of knowledge gaps in understanding and response to climate change risks on fisheries, aquaculture and on livelihoods will form the basis for designing appropriate long term integrated adaptation actions for the areas. On the other hand the project should use the local knowledge and understanding of climatic variability. In general the contribution to implementation of EAF and EAA will be a most relevant added value.

***Component 3: Enhancing local adaptive capacity to support climate resilient fisheries/aquaculture management and alternative livelihoods in the face of climate change***

**Baseline:**

-The **Aquaculture and Fisheries Management Project in Haor Area** basin to improve socioeconomic status of the poor fishers and fish farmers through building capacity and creating income earning opportunities, increase fish production, strengthen technical capacities and better management practices for fisheries including culture based fisheries. However, this project lacks focus on climate change impacts on fisheries and aquaculture. Although development and application

of technologies for CC resilient fisheries and aquaculture management at the field level are considered there is no programmatic approach and coherence with national and local policies.

-The **Community Based Sustainable Management of Tanguar Haor Programme** by the Ministry of Environment and Forests (MoEF) through IUCN and partners NGOs focusing on a Ramsar site in the *haor* basin under Sunamganj district. The goal of the project is to put in place a co-management system for the Tanguar *haor* (TH) Ramsar site which conserves ecosystem values and services and provides a basis for an improvement of livelihoods for rural communities including training and access to livelihood opportunities, thus providing long term sustainability of co-management systems. Although this initiative does not have a CC explicit component, it provides good base line support in terms of technical capacity building on improved management of some fishery resources, this being an essential basis for CC adaptation.

-The **Community-based Adaptation to Climate Change in Ecologically Critical Areas** mentioned above as a baseline project under Component 2 will also provide baseline support under this component in terms of improve fisheries management and adequate use implementation of fisheries sanctuary areas.

-The **Feed the future Aquaculture project** – coordinated by DoF and WorldFish in 20 south-western coastal districts is providing better technologies and better inputs such as improved quality and/or genetically improved lines of tilapia, carps, prawns and shrimps as seeds to aquaculture farmers, providing the basis for fish yield improvements of 12-27% for ponds and *ghers* in the southern delta, benefiting around 721,672 farm households. This constitutes a strong basis for better management and adoption of technological improvements in aquaculture that could increase the sector resilience to CC.

-The **Aquatic Agricultural Systems (AAS)** CGIAR research program in Bangladesh being implemented by WorldFish in association with DoF and DAE aiming at “improving the well-being of aquatic agricultural system-dependent peoples has several experimental sites that cross cut with the proposed LDCF project (described above in the baseline initiatives). One of the focuses of this research programme is strengthening resilience and adaptive capacity of vulnerable poor and marginalized communities and will incorporate lessons an innovative CC adaptation piloting entitled “smart farm” project now being implemented in four south-western coastal districts of Bangladesh. However, this project has emphasized more on the agricultural systems rather on the well-being of fishing communities and coastal aquaculture-dependent households. This project also lacks a policy component to improve the fisheries and related policies by incorporating CC issues.

**The proposed LDCF** project will fill the gap in the area of climate resilient fisheries and aquaculture technologies /approaches development and applications specific to address the main local threats including monitoring and information systems but also including gender sensitive and capacity building dissemination improvements to make such technologies widely available and easy to spread.

#### **Component 4: Dissemination of best practices and lessons learned, monitoring and evaluation**

Most important adaptation benefits of this component are related to the provision of information with appropriate communication tools (e.g. a web portal) on lessons learned and best practices from the use of different CC resilient fisheries, aquaculture and livelihood technologies/ approaches. The monitoring and follow up will also be available through a web portal.

#### **A.1.5 Global benefits (GEFTF, NPTF) and adaptation benefits (LDCF/SCCF)**

##### **Adaptation benefits (including gender benefits):**

In the south-western coastal area of Bangladesh majority of the poor households' livelihood is dependent on small scale aquaculture (both fish and shrimps) and fishing related activities. Many poor and marginal households in the coastal area operate small scale fish and shrimp farms in ponds/*ghers* including homestead ponds. While in the deeply flooded *haor* site, the poor are more dependent on

fishing during monsoon while work as farming labourers and small scale aquaculture in perennial and seasonal ponds in dry season. However, in years when flooding damages crops and fish ponds, the poor are forced to out migrate to cities for cash income. Recognizing the fact that the poor households will be the hardest hit by the adverse impacts of climate change due to their low adaptive capacity, the proposed project will target the poor and small holder aquaculture and fishing dependent households in both the sites towards building their adaptive capacity to overcome the impacts of climate change on their livelihoods and livelihoods assets.

The poor and small holders in the project area will be benefited from project interventions both socially and financially including capacity development to adapt to the adverse impacts of climate change and variability. The ICT based information services to be set up under the project will help the small holder aquaculture farmers (fish and shrimps) from losses of fish & shrimps due to both rapid and slow onset climate risks in coastal and *haor* regions. Additionally, these fishing and aquaculture based poor families will be benefited through disaster early warning systems (leveraged with other actors working on early warning systems in project sites) that would not only saving their fish and shrimps in ponds/*ghers* but also in protecting their houses and other livelihoods assets from disasters and climate change-induced extreme events. The enhancement of human capital through participating in various training programmes, climate change impact assessment activities and acquiring of climate resilient aquaculture and fisheries management technologies /approaches from the project they will be able to raise their income and assets in the face of climate change which appears as new dimension threats to their livelihoods. Activities of the proposed project on high value crop cultivation on fish & shrimp ponds dykes and homestead lands will benefit the targeted poor households nutritionally through higher intake of balanced food items. Dyke cropping in homestead based fish and shrimp ponds will allow the women folk to get engaged in productive activities and thereby they would contribute raising their family incomes alongside ensuring household food security.

A recently completed USAID funded CAARP project implemented by WorldFish aiming at rehabilitation of cyclone Sidr affected small scale aquaculture farmers revealed that over 20% fish and shrimp ponds in the south-western coastal area is owned or managed by the poor women headed households. Supporting and engaging these women headed farm households towards assessing climate change impacts, designing and operating climate smart farming systems by the women satisfying their special needs will enhance their knowledge and skills to face climate adversity. Engagement of men and women in local level climate vulnerability assessment and development of gender disaggregated adaptation needs and actions in the planning processes will cater gender inclusive adaptation to climate change impacts. Further support to these women aquaculture farm households in climate smart aquaculture practices, social mobilization, capacity building, value chain and market linkage development and access to local level decision making spaces will facilitate enhancing household incomes, inclusivity and adaptive capacity. All these will collectively facilitate ensuring gendered adaptation to climate change impacts in the fisheries sector.

Aquaculture operations schemes have numbers of upstream, intercultural and downstream activities. For example, fish fingerlings rearing, shrimp PL (post larvae)/fish fingerlings trading, pond preparations, etc. are all upstream activities while care taking, feeding, fertilizing, watering/water exchange, sampling, fall under intercultural activities. Activities include fish harvesting, processing, transporting, marketing, etc. is considered as downstream activities. In carrying out most of these activities, the poor are engaged on daily wage basis and thus the project is expected to create substantial employment opportunities for men and women from poor households and thereby benefiting the wider communities. It is noted that a substantial number of aquaculture labourers are poor and distressed women who would be able to raise their incomes and livelihoods on a sustainable manner through getting employment opportunities in climate resilient aquaculture farm managements in the climate sensitive coastal and *haor* regions of Bangladesh.

Support to develop linkages between community groups (men and women) with the service providers at union and upazila (sub-district) levels including disaster management committees will benefit the target communities through tapping available resources from government and private entities beyond the project supports.

### A.1.6 Innovativeness, sustainability and potential for scaling up

The project is innovative in the sense that addresses climate change vulnerability and adaptation in fish and fish farming communities, a sector that has been underrepresented and often overlooked not only in Bangladesh but worldwide. The production and delivery of fish is fundamental for the food security and nutrition of millions of people in Bangladesh, of outmost importance for women and their provision of protein for their families and newly-born. On the other hand the aquatic systems and fishery is often an open access resource for the poorest of the poor, presenting a challenge for the conservation of biodiversity and ecosystem services and climate change can make the situation much worst if measures are not taken targeting the sector.

Innovative aquaculture (better fish cages, ponds, better and biosecure hatcheries, new more salinity resistant strains etc.) and fishery technologies/approaches (e.g. culture-based fisheries) along with dissemination of practices will be developed with the local communities. This should ensure ownership and good potential for scaling up.

Improving adaptation in fisheries and aquaculture is also a win-win approach because increased resilience is often based on better management practices; therefore all the activities and outputs should drive and contribute to improved management of resources and improved food security and development.

The activities to enhance local adaptive capacity have a great potential for scaling up and replication if the other two components of the project are also well implemented. The approach proposed here can also be replicated in other countries and regions.

### A.2 Stakeholders. Identify key stakeholders (including civil society organizations, indigenous people, gender groups, and other as relevant) and describe how they will be engaged in project preparation.

A steering committee will be established under PMC to coordinate the role and responsibilities of different stakeholders involved in the project through appropriate coordination mechanism. The steering committee will establish necessary link with other Climate Change group within the country so that appropriate synergies are maintained between activities that have been implemented/executed on CC adaptation and mitigation. Local communities will be strongly involved.

Key stakeholders	Engagement during project preparation	Roles during project implementation
Department of Fisheries (DoF)	Lead agency; support full PPG process, enhance their ownership.	Main executing agency of the project, coordination with all concerned stakeholders including FAO and WorldFish, house the project team, documentation and reporting.
Bangladesh Fisheries Research Institute (BFRI)	Involve them early on, and tasking with the technical aspects in the PPG.	Develop on farm climate resilient aquaculture technologies for the coastal aquaculture affected by the adverse impacts climate change. BFRI could also provide training to the DoF officials on climate resilient fisheries and aquaculture practices.
Department of Agriculture Extension (DAE)	Provide relevant inputs for training needs.	Provide training and technical support to the project communities/ beneficiaries on climate resilient farming systems suitable for coastal areas, integrated agriculture-aquaculture systems, crop cultivation on

		pond/gher dykes.
Bangladesh Forest Department (FD)	Provide relevant inputs specially regarding adaptation approaches and integrated management.	Facilitate collaborative management of Sundarbans fisheries and aquatic resources jointly with DoF including establish linkages with FD projects (IPAC, SEALS, CABCC-CF) working in Sundarbans Impact Zones (SIZ) and adjacent coastal areas.
Bangladesh Water Development Board (BWDB)	Provide relevant inputs and engagement in the vulnerability assessments and adaptation approaches.	Facilitating drainage and protection of aquaculture ponds from tidal surges and coastal inundation through properly maintaining coastal protective dykes.
FAO	Coordinate, provide technical inputs and create synergies in the preparation of the project.	Executing agency of the project can facilitate incorporation of CC issues in the national fisheries and other related policies and strategies.
National Climate Change Unit (CCU)	Provide relevant inputs and engagement in the vulnerability assessments.	Facilitate coordination, technical and administrative support to the project, policy advocacy.
Disaster Management Bureau through its Comprehensive Disaster Management Program- II (CDMP-II)	Provide relevant inputs and engagement in the vulnerability assessments and adaptation approaches	Provide training of the communities and staff on DRR and climate change adaptation, facilitate setting up of early warning systems for the coastal aquaculture communities.
Local community organizations, local leaders, women organizations, local schools	Will participate in stakeholders' workshops and consultations to prepare the project.	Will play an active role as recipients of the awareness raising, training on new technologies and approaches and leading role in the adoption and dissemination of these.
Local government through Upazila and Union level disaster management committees	Provide relevant inputs and engagement in the vulnerability assessments and adaptation approaches.	Providing early warning of cyclone and storm surges to take preparedness measures and also provide/coordinate disaster response activities.
WorldFish	Provide technical support and engagement /coordination with other Baseline activities led by WorldFish.	Leverage activities with the proposed project in technical areas (quality fish seeds) through FTF Aquaculture and AAS projects including improving the relevant national policies and strategies.
USAID IPAC project in Sundarbans adjacent districts	Provide relevant inputs and engagement as appropriate.	Link project communities with the Co-Management Committees (CMCs) formed under IPAC to facilitate raise their voices at sub-district level decision making spaces.
EU funded SEALS project in Sundarbans impacts zone	Provide relevant inputs and engagement as appropriate.	Facilitate the project in supporting poor and women headed households to take up climate resilient aquaculture systems.
Private entrepreneurs especially fish seed farms operators /vendors, fish marketing agencies	Involved in all participatory activities as appropriate.	Be involved in the development/ implementation of satellite hatcheries. Ensure supply of quality fish and shrimp seeds to the project communities.
NGOs and CSOs	Involved in all participatory activities as appropriate.	Project implementation, community mobilization, participatory planning and assessment, self-help groups formation, micro credit, gender awareness, local level advocacy and governance, DRR activities, adaptation learning and

		documentation.
--	--	----------------

**A.3 Risks. Indicate risks, including climate change risks, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (Table format acceptable).**

Risk	Level of risk	Mitigation strategy
Inadequate knowledge and skills among the relevant agency officials on climate change issues and adaptation strategies for the fisheries sector.	Low	Training and orientation of DoF and relevant agency officials on climate smart fisheries management strategies and approaches.
Lack of availability of relevant climate related data and information.	Medium	Establish instant access to data on relevant weather parameters (rainfall, drought, temperature, cyclones, flooding, cold spells, etc.) for the project areas by means of strengthened collaboration between the National Meteorological Department and Flood Forecasting Center of BWDB.
Current weather forecasting/ early warning systems focuses on maritime aspects (safety of sea going vessels/boats) ignoring the needs of the aquaculture farmers who frequently face disaster risks.	High	Develop specific protocols with the Meteorological Department, for disseminating weather messages that the coastal aquaculture farmers need to protect their farms from climate related extremes. Specific weather forecasting systems can be developed with the organizations operating 'community radio' in the coastal areas or using mobile phones.
Non availability of quality fish and shrimp seeds to improve broodstock banks and satellite hatcheries in the localities.	Medium	Support quality fish/shrimp seeds via the private sector and interested fish farmers. Leverage different projects (viz. FTF Fisheries and IAPP) to achieve greater focus on quality fish and shrimp seeds production at the local level.
Weak coordination between relevant government agencies (viz. DoF, DAE, DoL, BWDB) both at national and local levels.	Medium	Formation of inter-departmental coordination committee at the HQ level, while at the district and Upazila levels through the District Development Coordination Committee (DDCC) and Upazila Development Coordination Committee (UDCC) respectively, to achieve greater coordination among the relevant government agencies.
Increased disaster risks and climate change threats in the coastal area in the form of cyclones, storm surges, salinity intrusion, increased climate variability etc.	Medium	Time climate related extremes events or stressors better addressed in aquaculture cycles/ systems. For example, stocking of ponds can be done after the possible timing of cyclones/flooding and the fish/shrimps can be harvested before the possible time of such disaster events. Inclusion of fast growing, saline and drought tolerant fish species can be adopted to reduce the risk. In addition, rapport can be built with the local disaster volunteers to ease early warning systems targeting the coastal aquaculture communities.

**A.4 Coordination. Outline the coordination with other relevant GEF financed and other initiatives.**

This project should be well connected and with other UN projects. Key initiatives the project should liaise with include:

**-The LDCF project entitled “Community-based Adaptation to Climate Change through Coastal Afforestation”** Since 2010, the Forest Department (FD) has been implementing an LDCF project entitled “Community-based Adaptation to Climate Change through Coastal Afforestation” with technical support from the UNDP in four coastal districts (Barguna, Bhola, Noakhali and Chittagong). The project demonstrated mangrove and non-mangrove plantation in the newly accreted char lands and on embankments in the coast to create a protective barrier (green belt) against cyclone and storm surges. The project is also supporting coastal communities to enhance their livelihoods and incomes through demonstration of innovative techniques of producing fish, vegetables, fruit and trees in saline affected coastal lands termed as “ditch and dyke” method or “3-F model” (fish, fruit and forest) for food and income security of people live in saline prone areas. In addition, saline tolerant rice varieties, improved pond aquaculture, crop diversification, livestock rearing (duck, poultry and cattle) have been implemented in the targeted communities through direct involvement of relevant government line agencies like FD, DoF, DAE and DLS. The project provided training to the participating communities and local government officials on climate change adaptation and developed various modules on CC adaptation. This project has some interesting learning in mobilizing and working with the coastal vulnerable communities including women in building their adaptive capacity to tackle the climate change impacts from which the proposed project can be benefited.

In this case there will be a close coordination with UNDP and relevant national institutions to ensure synergies and avoid overlaps, especially regarding components 2 and 3 of the current project. For example the current initiative will use this project experience in the use of salinity tolerant fish species for the trial and pilots in hatcheries and demonstration farming systems. Also the pilot farming systems and satellite hatcheries will explore the afforestation project experience to improve the selection of more secure aquaculture farming areas

**-The Community-based Adaptation to Climate Change in Ecologically Critical Areas (CBA-ECA) - Department of Environment (DoE), Government of Bangladesh.** The project is funded by the climate change trust fund (CCTF) of the government under the technical support of UNDP.

-Another relevant project about to start is the **Comprehensive Disaster Management Programme (Phase II)**. The project aims to further reduce Bangladesh's vulnerability to adverse natural and anthropogenic hazards and extreme events, including the devastating potential impacts of climate change technically supported by UNDP and funded by several donors. The current initiative will connect closely with this Disaster Management Programme specially when developing local monitoring systems and EWS for the fisheries and aquaculture stakeholders. Also the design and location of the satellite hatcheries and pilot aquaculture farms/new farms etc. will be designed following risk maps that should be supported by the Comprehensive Disaster Management programme.

In general there will be close coordination with other initiatives including baseline projects, for example with the Feed The Future Aquaculture project led by WorldFish, to exchange information and technical support in the use of salinity tolerant aquaculture species.

Relevant coordination with the **Smart farm project** is also planned. This initiative implemented by WorldFish is a 3-year “smart farm” and farmers’ led adaptive research project to develop climate resilient integrated farming systems in four southwestern districts of Bangladesh since 2012, as part of the CGIAR Climate Change, Agriculture and Food Security (CCAFS) Project (US \$ 0.3 million). The project is funded by the International Water Management Institute (IWMI) and focuses on livelihood diversification, household income enhancement, food security, risk transfer. These will be achieved through maximum utilization and efficient use of land and water resources in the coastal areas where climate related risk increasingly affecting farm productivity and livelihood outcomes. Specific project activities include climate resilient agricultural practices, boosting fish production and enhancing natural fisheries production, water management for crop and fish productions to enhance livelihoods of the affected communities. Besides, locally appropriate weather forecasting systems, index based

insurance systems, gender aspects of adaptation, capacity building of targeted communities at the risk of climate change impacts and local governance are also key areas of interventions.

The project intends to promote integration of discrete farming components (fish culture, agriculture, land and water) to generate complementary and ensuring maximum utilization and out puts. The current LDCF project will coordinate efforts with the Smart farm project in those coastal districts where it is implemented. Special consideration will be given to the use of their experience in more efficient farming systems when designing the pilot improved aquaculture systems and also to improve integration of aquaculture and fisheries.

## **B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:**

### **B.1. National strategies and plans or reports and assessments under the relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSAs, NIPs, PRSPs, Biennial Update Reports, etc.**

Bangladesh is considered as one of the most vulnerable countries of the world to be affected by the adverse impacts of climate change and climate variability. Recognizing the fact, the Government of Bangladesh has taken up various proactive measures to combat the impacts of climate change and increase resilience of its people, assets and resources. To this end, Bangladesh developed and submitted the NAPA in 2005 in compliance of the United Nations Framework Convention on Climate Change (UNFCCC) requirements as a least developed country (LDC) earlier than many other LDCs. Formation of high level Inter-Ministerial Committee on Climate Change headed by the Minister, Ministry of Environment and Forests (MoEF) with the representation from relevant Government Ministries and Departments including Civil Society Organizations (CSOs) and research institutions in 1992 has been the mile stone of the seriousness of the state to address climate change issues. Besides, establishment of Climate Change Cell (CCC) housed at the Department of Environment (DoE) to act as secretariat for supporting and coordinating climate change related activities across various ministries and departments. The project concept is in conformity of the focus of the Bangladesh Initial National Communications (2002) on “immediate adaptation measures for the fisheries and aquaculture sectors to the adverse impacts of climate change”.

The Bangladesh Country Investment Plan (CIP) endorsed in June 2010 as living document emphasizes on developing sustainable responses to climate change impacts. The CIP comprises a “Country Investment Plan for Fisheries Resources Development (2010-2015)” that sets out three priority areas: i) improved management of inland and marine fisheries resources, ii) increased productivity for small-scale inland aquaculture and iii) coastal shrimp and freshwater prawn culture. The proposed project interventions cross cuts all these three CIP priorities in the national fisheries sector development. The proposed project is also in line of the CIP Programme-1 that focused on “*integrated research and extension to develop and propagate sustainable responses to climate change*” that emphasizes “*increased food productivity and increased resilience/ adaptation to climate change including application of resilient farming systems*”. The sixth five year plan (SFYP) of Bangladesh (2011-2015) recognized the impacts of climate change as a new threat to development and sets out some targeted activities to tackle climate change impacts. The SFYP explicitly mentioned that the benchmark experience in adaptation in fisheries sector at country level is very limited and targeted to conduct studies to generate relevant knowledge to launch climate smart fisheries sector development programmes.

Engagement of parliamentarians in various national and international negotiation forums (such as UNFCCC- COPs) on climate change issues has been the indicator of political commitment of the Government of Bangladesh to tackle climate change impacts in a collective manner. In 2010, Government of Bangladesh established a Climate Change Unit (CCU) under the Ministry of Environment and Forests (MoEF) as an apex body to coordinate activities relevant to climate change adaptation and mitigation at the national level. Besides, the government is facilitating establishment of Climate Change Cell (CCC) in each of the Ministries for better coordination and internalization of

climate change activities in intra and inter Ministries and Departments. The Disaster Management Bureau (DMB), Government of Bangladesh through its comprehensive disaster management programme (CDMP-II) is supporting the DoF to establish a CCC to facilitate climate compatible fisheries sector development programmes.

The project concept is proposed under the LDCF/SCCF Focal Area: Climate Change Adaptation that addresses national priorities to tackle climate change-induced risks as laid out in the Bangladesh NAPA (2005). Specifically, the project addresses NAPA priority intervention 13, "*Adaptation to fisheries in areas prone to enhanced flooding in northeast and central region through adaptive and diversified fish culture practices*" and priority intervention 14 "*Promoting adaptation to coastal fisheries through culture of salt tolerant fish species in the coastal areas of Bangladesh*". Components of this proposed project also cross cut with NAPA priority intervention number 4 on "*Climate change and adaptation information dissemination to vulnerable community for emergency preparedness measures and awareness raising on enhanced climatic disasters*" and intervention number 6 on "*Mainstreaming adaptation to climate change into policies and programmes in different sectors*". This project is also in line of the priority actions suggested in the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) which was approved by the government of Bangladesh in 2008 (revised in 2009). The project components, outcomes and outputs are aligned directly with the 4 out of total 6 themes of BCCSAP viz. food security, social protection and health (theme 1), comprehensive disaster management (theme 2), research and knowledge management (theme 4) and capacity building and institutional strengthening (theme 6).

NAPA priority actions on aquaculture and fisheries suggests taking up urgent adaptation measures in the south-western coastal zone and deeply flooded *haor*<sup>23</sup> basin in the northeast due to their exposure to multiple CC induced hazards. In the coastal areas, cyclones, salinity intrusion, erratic rainfall, sea level rise and flooding are the major climate induced visible threats that affect aquaculture and fisheries systems, and the *haor* basin is affected by increasing events of early flash floods, pre/early monsoon drought, erratic rainfall, monsoon flooding, increased siltation of wetlands.

This LDCF project will avoid duplication and replication of other project activities in the region rather would seek to address the additional activities aiming to reduce the adverse impacts of climate change and climate variability on coastal fisheries and aquaculture sub-sectors including supporting the communities that are left out from other development initiatives in the area.

## **B.2 GEF focal area and/or fund(s) strategies, eligibility criteria and priorities**

The proposed project concept is formulated in alignment with the "Revised Programming Strategy on Adaptation to Climate Change for the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF)" October 2010 (GEF/LDCF.SCCF.9/4/Rev.1). This concept corresponds to the results-based management focal area framework objectives 1 - CCA Objective 1: *Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional and global level*, CCA Objective 2: *Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level* and to CCA Objective 3: *Promote transfer and adoption of adaptation technology*.

Bangladesh is eligible to access funding from the LDCF as it has signed and ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and 1994 respectively and met the compliance by submitting the NAPA in 2005. Bangladesh has benefited from previous funding from the LDCF in taking up NAPA follow up project "Community-based Adaptation to Climate Change through Coastal Afforestation" (USD 3.3 million). Another LDCF project is in the pipe line which is also in the forestry sector (*Integrating Community-based Adaptation in to Afforestation and Reforestation Programmes* as complementary to the previous LDCF project now being implemented in four coastal districts of Bangladesh by the Forest Department, with technical

---

<sup>23</sup> Vast natural depressions mostly occurring in the north-eastern part of Bangladesh.

support from UNDP. The proposed project is consistent with the decisions of the Conference of Parties (CoP-9) to implement the priority interventions from the Bangladesh NAPA and thus met the criteria as outlined in UNFCCC Decision 7/CP.7 and GEF/C.28/18.

The proposed project for the first time in Bangladesh intends to build adaptive capacity of the vulnerable fishing and coastal aquaculture-dependent communities already being affected by the adverse impacts of climate change. In the absence of any DoF led national fisheries adaptation program this proposed project is expected to generate relevant knowledge and information that would form the basis for replication in other areas of Bangladesh and in other countries having similar situations. The LDCF resources sought through this project will address the climate change related threats to coastal fishing and aquaculture communities and enhance their adaptive capacity. The project will follow all the eligibility criteria as set out in the LDCF/SCCF operational guidelines.

### **B.3 The GEF Agency's comparative advantage for implementing the project**

FAO, with 191 member countries, is the United Nations agency with competency in all areas of fisheries and aquaculture. FAO has led global work on implementing the FAO Code of Conduct for Responsible Fisheries, an ecosystem approach to fisheries and aquaculture and has produced codes of practices and standards related to product safety and responsible trade, including guidelines for the ecolabelling of fish and fishery products. The Organization is currently engaged in developing Voluntary Guidelines on Securing Sustainable Small-Scale Fisheries through a global, participatory process.

FAO is contributing to bringing fisheries and aquaculture into the climate change discussions at national, regional and global level. This has included release of a Policy Brief on building adaptive capacity, an FAO Expert Workshop on Climate Change Implications for Fisheries and Aquaculture in 2008, and a global review of climate change implications for the sector in 2009. In 2009, FAO helped to form the Global Partnership for Climate, Fisheries and Aquaculture (PaCFA), a voluntary grouping of 23 international organizations and sector bodies sharing a common concern for climate change interaction with global waters and living resources and their social and economic consequences. With FAO support, the PaCFA has been raising awareness of issues relating to oceans, fisheries and aquaculture within the United Nations Framework Convention on Climate Change (UNFCCC) processes. FAO is currently engaged in a number of projects and activities around the world towards strengthening adaptation and mitigation of climate change in fisheries and aquaculture including through the project "Climate Change, Fisheries and Aquaculture: Understanding the Consequences as a Basis for Planning and Implementing Suitable Responses and Adaptation Strategies funded by the Government of Japan, the EAF-Nansen Project. Furthermore, climate change is always an important consideration in planning and implementation of an ecosystem approach to fisheries and therefore enters into most of FAO's extensive normative and field-based programmes of work on EAF.

With respect to staff capacity, FAO has an Office in Bangladesh with 43 staff including operations and the Country Emergency and Rehabilitation Coordination Unit, while there are 208 project staff working in the whole country. FAO Bangladesh is supported both technically and administratively by the Regional Office for Asia and the Pacific in Thailand and by FAO Headquarters in Rome. There are specialists in these offices with solid knowledge on the fisheries and aquaculture and climate change issues in Bangladesh and with solid background on the development and implementation of new aquaculture farming technologies (seeds, feeds, environmental management EAF, EAA etc.). As for all projects, a multidisciplinary Project Task Force will be set up and draw on the range of technical expertise available throughout FAO to support the project, including from the regional and sub-regional fisheries officers, operational and other technical staff as required, as well as from the Fisheries and Aquaculture Department and other technical units, as necessary.

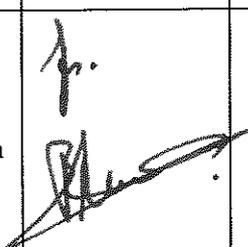
**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S)  
AND GEF AGENCY(IES)**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):** (Please attach the Operational Focal Points endorsement letter(s) with this template. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE (MM/DD/YYYY)
Md. Shafiqur Rahman Patwari	Secretary and GEF Operational Focal Point	Ministry of Environment and Forests	07/14/2013

**B. GEF AGENCY(IES) CERTIFICATION**

**This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for project identification and preparation.**

Agency Coordinator, Agency name	Signature	Date (MM/DD/YYYY)	Project Contact Person	Telephone	Email Address
Gustavo Merino Director Investment Centre Division Technical Cooperation Department FAO Viale delle Terme di Caracalla (00153) Rome, Italy TCI-Director@fao.org		January 29, 2014	Doris Soto Senior Fisheries Resources Officer/	(+39) (06) 5705-6149	Doris.soto@fao.org
Barbara Cooney GEF Coordinator Technical Cooperation Department FAO  Email: <a href="mailto:Barbara.Cooney@fao.org">Barbara.Cooney@fao.org</a> Tel: +3906 5705 5478					

1000