

Bangladesh Environment, Forestry and Climate Change Country Investment Plan

Second Draft

(27/05/2016)

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Chapter 1. Introduction

1.1 The Country Investment Plan

Bangladesh is on track to becoming a middle income country by 2021, a key stated national policy objective. The economy is transforming from primarily agriculture-based (although around 50% of the population still derive livelihood from primary production within agriculture, it now contributes less than 20% GDP) to a mix of light industry – such as ready-made garments - services and, in some cases, heavy industry. Remittances are also a source of foreign exchange earnings. Growth is running at over 6% per annum; one main driver has been past population increases which means that half of the population of Bangladesh are aged under 25. However, this rapid economic development has not been without associated costs; these have included major social change – such as rural depopulation and internal migration – and environmental problems, such as degradation of natural resources, and air and water pollution. At the same time, Bangladesh is among the list of countries most at risk from the effects of climate change.

In the country, there are more than 200 laws and by-laws exist to tackle these challenges related to environmental issues. Strategies and policies are in place. The Government of Bangladesh (GoB) realises that good public policy needs to be matched by investments to ensure implementation. Some key investments have been made, by the government, on its own or supported by development partners. Yet, investments in the Environment, Forestry and Climate Change (EFCC) sectors have suffered from a lack of coherence and delivered uncertain results in terms of their overall impact. This contrasts with the food security sector which is generally held up as an example, where efforts have been made to ensure the coherence of investments in support of the National Food Policy Plan of Action, through the creation of a national investment plan. However, at this stage Bangladesh does not have a formal framework to link environmental, forest, and climate change policies to the investments needed to achieve the desired results within a given time-span. For this reason it was decided to develop a Country Investment Plan (CIP) covering these inter-related sectors.

The EFCC investment plan provides a strategic framework for national and international investments for the environment, forestry and climate change sectors in Bangladesh, and to coordinate implementation with all of the sector's stakeholders. The CIP is a 5-year framework that identifies priority areas for investment in the EFCC sectors, and estimates the financing needs to be provided by Government, and its development partners. It is anchored to, and aligned with, the national vision of becoming a middle income country by 2021, and the Seventh Five Year Plan, together with a number of key legal and policy documents including:

- Constitution of the People's Republic of Bangladesh and its Amendments
- National Perspectives Plan (2010–2021)
- National Sustainable Development Strategy (2010-2020)
- Medium-Term Budgetary Framework (2013-18)
- Bangladesh Climate Change Strategy and Action Plan (BCCSAP, 2009)
- Integrated Resources Management Plans for the Sundarbans 2010-2020
- National Biodiversity Assessment and Programme of Action 2020
- National Environment Policy (1992)
- National Environment Management Action Plan (1995)

- Energy Efficiency and Conservation Master Plan (2015)
- Master Plan of Haor Areas (2012)
- National Aquaculture Development Strategy and Action Plan 2013–2020
- National Forest Policy (1994) and draft Forest Policy (2015)
- Tourism Development: 7th Five Year Plan Background Paper. 2010
- Bangladesh Climate Change and Gender Action Plan (2013)
- National Wetland Policy (1998)
- National Water Policy (1999)
- National Land Use Policy (2001)
- National Biodiversity Strategy and Action Plan (2004, updated in 2016)

The CIP also reflects the measures and targets that the Government has submitted to the United Nations Framework Convention on Climate Change (UNFCCC¹) and which are now referred to in the Paris Agreement.

The CIP is a whole-of-Government initiative led by the Ministry of Environment and Forests (MoEF), and reflects the priorities of the Government and a wide range of sector stakeholders active in the EFCC sectors.

The overall goal of the CIP is to increase the contribution of the EFCC sectors to the sustainable development of the country, through the enhanced provision of ecosystem services², thereby helping to reduce poverty, improve environmental and human health and increase resilience to climate change.

This will be achieved through enhanced utilization of natural resources, pollution control, climate change mitigation and adaptation and improvement in environmental stewardship.

Four investment pillars have been elaborated through an extensive and inclusive consultation process:

- (1) Sustainable development and management of natural resources;
- (2) Environmental Pollution Prevention and Ecosystem Restoration;
- (3) Adaptation, mitigation and resilience to climate change; and
- (4) Environmental Governance, Gender & Human and Institutional Capacity Development.

1.2 The CIP Formulation Process

The CIP formulation process has been interactive and has involved a broad range of (many) stakeholders over a period of two years. The process has been overseen by a Steering Committee comprising key representatives of the environment, forest and climate change Sectors including representation from academia, chaired by the Secretary, Ministry of Environment and Forestry. The formulation involved:

- (i) A review of key legal, policy, strategy and planning documents;
- (ii) The compilation of data on sectoral trends;

¹http://www4.unfccc.int/submissions/INDC/Published%20Documents/Bangladesh/1/INDC_2015_of_Bangladesh.pdf

² Term: “ecosystem services” – Millenium Ecosystem Assessment (2005), defined further below

- (iii) Individual consultations with a broad cross section of stakeholders from Government, CSOs, CBOs, private sector and development partners;
- (iv) Stakeholder group consultations in several forums, national workshops, divisional and district-level workshops, and meetings with local communities. A workshop was held in Dhaka (May 2015) to obtain early high-level feedback on some potential alternative structures for the CIP. This was followed by other workshops, working group meetings, interviews with resource persons and national and international specialists (June-November). A consultation on gender dimensions was held in Dhaka in March 2016.

1.3 Conceptual framework, Design principles, and Scope of the CIP

Conceptual framework

The conceptual underpinnings of the CIP are to be found in the Millennium Ecosystem Assessment of 2005, which popularised the term ‘ecosystem services’³. Ecosystem services are the multiple benefits humans obtain from the environment, and can be grouped into four broad categories:

- provisioning services, such as the production of food and water;
- regulating services, such as the control of climate and diseases, or prevention of flooding;
- supporting services, such as nutrient cycling and crop pollination; and
- cultural services, such as spiritual and recreational benefits derived from the environment

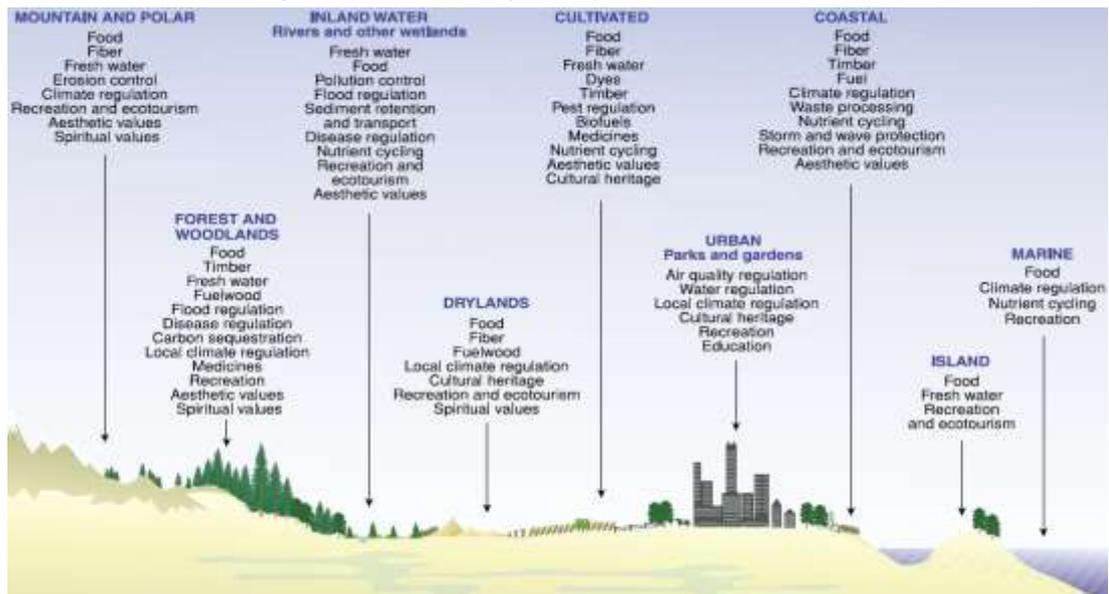
All human activity depends to some extent on ecosystems services, whether involved in food and other goods’ production, provision of services, or social/leisure activities.

As countries choose pathways to development, it is important to keep track of the potential impact on the environment of the choices which are made. To help inform decision makers, and compare options, ecosystems services can be assigned economic value. In addition, an ecosystems services approach is specifically useful for adaptation strategies to climate change. The Convention on Biological Diversity currently defines ecosystems based adaptation as the use of biodiversity and ecosystems services to help people adapt to the adverse effects of climate change.

Different ecosystems provide different services, underlining the need for natural diversity – also shown in Figure 1.

³ Yaqub (2015) elaborates the reasons for the choice of the underlying conceptual framework for the CIP in the zero draft of the Bangladesh Environment, Forestry and Climate Change Country Investment Plan (consultant report, 7 September 2015).

Figure 1: Sources of Ecosystem services



Source: MEA (2005, policy)

Design principles

Design principles define how the Government of Bangladesh and the stakeholders involved (producer organizations, NGOs, private sector, academia and DPs) will work together to achieve the overall goal of the CIP by the year 2021. The following principles have emerged from the CIP consultation process and have informed the CIP design process:

Participation

Participation supports good governance, citizenship, and accountability. The benefits are social inclusion of disadvantaged groups and equitable economic growth. The broad dialogue processes put in place during the CIP development phase can be pursued during implementation so that stakeholders can effectively participate in the design, implementation and monitoring of specific programmes and projects which will affect them.

Increasing aid effectiveness

Though aid from development partners makes a diminishing contribution to Bangladesh GDP, it still accounts for a significant proportion of the annual development budget. The CIP would promote progress in internationally-agreed aid effectiveness principles. The CIP aims to reduce duplication of efforts and transaction costs in aid management.

Alignment

Alignment refers to how well development programmes follow national policies, and utilise public finance systems. One of the tools for alignment is the Local Consultative Group on Climate Change and Environment. One important aspect is the predictability of development cooperation, and a CIP can help by monitoring both ongoing projects and the pipeline projects.

Management for results

A major planning challenge is to know how results from a collection of projects contribute to policy objectives. Routine project monitoring often does not capture this aspect well. The Government has moved towards results-based planning, such as in its Five Year Plans, but

improvements may be needed at the sector or thematic levels. The Government acknowledges that existing monitoring and evaluation is fragmented and unfocused, with GED monitoring impacts whilst IMED mainly monitors inputs and outputs (MoFinance, 2011).

Mutual accountability

In the Harmonization Action Plan (HAP) the Government of Bangladesh and DPs declared their willingness to create an effective development partnership based on mutual commitment, trust, respect and confidence through Implementation of HAP. The CIP would support this principle and provide a framework for implementation.

Gender and targeting considerations

Equity, including gender equity, is part of the investment plan. Indeed, the costs of environmental and natural resource degradation are disproportionately born by the poor and vulnerable people (World Bank 2016). Investments may be designed to target the poor, marginalised, minorities and vulnerable rural households who depend heavily on natural resources. The vulnerability to climate change is different for women, as their access and control over resources and decision making is more constrained than that of men. The CIP includes gender as a programme, and also mainstreams gender within other programmes; the Gender Action Plan in Annex 3 sets out the CIP's approach to this design principle.

Continuous improvement

It is recognized that the economic, social and environmental situation of Bangladesh is very dynamic. As existing policies and plans are updated and new ones developed, the CIP must be considered a "living document" where evolving issues and emerging investment priorities can be adequately analysed and accommodated, when needed. The provisions for its monitoring (see chapter on institutional arrangements) will allow for continuous learning and improvement.

Scope of the CIP

Definition of what will be included, or excluded, from the CIP was also part of the consultation process. The process of consultation led to the identification of the following criteria to define the scope of the CIP.

- Investment projects should contribute to the overall goal of the CIP. In other words, the CIP includes programmes, sub-programmes and projects that ***enhance the provision of ecosystem services***.
- The CIP should be "implementable". Hence, the CIP includes programmes and projects which are within the current implementation and monitoring capacity of the GoB. Implementation considerations also imply that selected institutions are identified as responsible for the implementation and monitoring of individual sub-programmes.
- Investments by the private sector, NGOs and CSOs are practically impossible to monitor with consistency and will therefore not be included in the CIP⁴. However, the CIP will include projects and programmes that catalyse private sector investments and enhance private sector participation in the policy development process.

⁴ The same criteria was used in defining the scope of the Agriculture, Food Security and Nutrition CIP.

- Complementarity, not duplication, will be identified in areas also covered in the agriculture, food security and nutrition CIP.
- Key recognized priorities in the EFCC sectors should be acknowledged/included in the CIP.
- Even as climate change is addressed in a dedicated pillar (see chapter 6), all envisioned investments should be “climate smart.”

Chapter 2. Country context

2.1 Economic, environmental and social context

Bangladesh has maintained an average annual growth rate of about 6 percent for more than a decade, and is predicted to sustain this for the coming five year period. The fact that this growth has been achieved in the face of occurrence of natural disasters (2007, 2009), the world food price crisis, and a global economic slowdown during the period indicates the resilience of the economy, supported by good macro-economic management, and some favourable external factors (such as remittances, and continued market access for certain goods). Sustained growth has contributed to reduction in poverty from 48.9 percent in 2000 to 31.5 percent in 2010, and 24.8 percent in 2015. Growth has also been associated with improvement in social indicators such as education, health and nutrition, and housing and sanitation.

According to the World Bank (2014) long term acceleration in growth rate has rested on improved growth of agriculture, stable growth of services and faster growth of industry especially manufacturing. However, this, coupled with increasing population pressure, has been associated with some degradation of certain ecosystems (rivers and wetlands, coastal environment, the high Barind and the Chittagong Hill Tracts (CHTs) and the urban environment; ground water has been irreversibly depleted in some areas, and deforestation and land degradation have also been noted. These factors affect the livelihoods and quality of life of significant numbers of the population, impose social costs that will be felt increasingly over time, and hence may hamper the sustainability of the growth achieved (World Bank 2016).

Another challenge to sustainability stems from climate change. More frequent and severe weather events – cyclones, cyclonic storms, storm surges, flash flood and drought are likely to pose multiple threats to growth, and the achievement of the targets of Vision 2021. The coastal region in the South and South West of Bangladesh already faces high tides which can lead to inundation and salinity intrusion, with an impact on livelihoods. But not all is due to climate change – to illustrate, such phenomena are complex in nature, arising from an interplay between seasonality of tides, some subsidence in the coastal zone, reduced upstream river flows (due to water extraction mostly in India), and possibly also rising sea levels.

Bangladesh has a variety of highly valuable ecosystems which are under specific pressure from pollution, unregulated use and climate change. The Sundarbans in SW Bangladesh - one of the largest tiger reserves in South Asia – is one such example. CHT also faces issues of soil erosion and deforestation due to human activity, which worsens the potential impact of natural flash floods during the rainy season. Besides these two large natural areas, Bangladesh counts a large amount of smaller natural reserves which also provide livelihoods to thousands of local people.

Finally, on a social dimension, Bangladesh has been recognised globally for its progress towards meeting the Millennium Development Goals, particularly in the areas of gender equality in education, combating HIV/AIDS, malaria and other diseases, and significantly reducing infant and child mortality rates. However, maternal and neonatal mortality rates remain relatively high. Access to key productive resources such as land is not always “equitable”. And violence against women is a hidden scourge. A challenge is the still limited

participation of women in decision making, from the home and community and including the MoEF and its agencies. Although gender indicators are improving, many women still face social and economic disadvantage – this holds them back from contributing their full potential to improve their own and their families’ lives, including their role as environmental stewards.

2.2 Relevant Institutions

Overall, environment, forestry and climate change issues fall within the jurisdiction of several ministries and divisions/departments, and also involve CSOs, NGOs and the private sector. Such a range of stakeholders poses a significant challenge for coordination.

The Ministry of Environment and Forests (MoEF) and its agencies are the central apex body of the Government of Bangladesh responsible for the policy, planning and administration of all forestry and environment-related issues and development programmes. They are the custodian of country’s environment and ensures its protection and development through the development and implementation of appropriate laws and regulations. The MoEF will be the lead ministry for the implementation of the CIP. Key agencies under MoEF are the Department of Environment, Forest Department, Bangladesh Forest Research Institute, Bangladesh Forest Industries Development Corporation, Bangladesh National Herbarium and Bangladesh Climate Change Trust.

Other key government institutions with a stake in the EFCC sectors include: the Finance Division and the Economic Relations Division of the Ministry of Finance (the latter being the National Designated Authority for the Green Climate Fund); the General Economic Division of the Planning Commission; the Ministry of Agriculture; the Ministry of Fisheries and Livestock; the Ministry of Water Resources; the Ministry of Disaster Management and Relief; the Ministry of Chittagong Hill Tracts Affairs; and the Ministry of Women and Children Affairs. For specific programmes, additional Ministries may include the Ministry of Food, the Ministry of Science and Technology, the Ministry of Public Administration, the Ministry of Power, and the Ministry for Local Government and Rural Development & Co-operatives. <complete with additional info>.

Of the more prominent NGOs, CSOs and academic institutions it is worth citing the following: International Union of Conservation of Nature (IUCN); International Centre for Climate Change and Development (ICCCAD); Centre for Climate Change and Environmental Research, BRAC University (BRACU); Centre for Policy Dialogue (CPD); Bangladesh Centre for Advanced Studies (BCAS); Institute for Forestry and Environmental Sciences (IFES) at Chittagong University; Bangladesh Institute for Development Studies (BIDS); Water Aid; Grameen Shakti; Arannayk Foundation; Palli Karma Sahayak Foundation (PKSF); Action Aid Bangladesh; Waste Concern, Oxfam GB; Technical Assistance for Rural Development (TARA); Christian Commission for Development in Bangladesh (CCDB); Centre for Natural Resources Studies (CNRS) Society for Environment and Human Development (SEHD). <complete with additional info>.

Several important private sector activities have a negative impact on the environment, including brick making, ship-breaking, chemical and pharmaceuticals, textile and garments; tanneries; coal based power plants - and so on. Food and other processing plants potentially emit effluent or solid waste, while urban areas also generate large quantities of solid and liquid waste.

At the moment, the involvement of the private sector in the sustainable management of natural resources, contributing positively to the EFCC sectors is limited. However, there is a handful of success stories that illustrate the potential of private sector involvement: for instance, the development of rural solar home systems by a joint venture between Grameen Shakti, an NGO, and Rahimafrooz; or the Clean Development Mechanism Project by Waste Concern. A strategy to further the engagement of the private sector in climate change adaptation in Bangladesh was prepared by the International Finance Corporation (IFC) in 2010. Meanwhile, tourism and related activities derive benefits from the environment.

Chapter 3. Government policies and key issues

3.1 General

The Government has prepared the Perspective Plan of Bangladesh (2010-2021) and recently the 7th Five Year Plan (FYs 2016-2020) which will be the vehicle for implementing the Perspective Plan. The Perspective Plan envisages that, by 2021, the “war against poverty” will largely have been won, the country will have crossed the middle income threshold, with the basic needs of the population ensured, and their basic rights will be respected. It is also targeted that this should all be achieved on a sustainable basis without damaging the environment.

The CIP is aligned with main international and national policies and strategies and seeks to coordinate investment and implementation arrangements of existing strategies. The main policy objectives that inform the CIP include the Sustainable Development Goals (SDGs), many of which target natural resources management, climate change and sustainable development. Bangladesh adheres to the principles of the Convention on Biological Diversity (CBD). The CIP furthermore is in line with the Foreign Aid Policy which is informed by the 2005 Paris Declaration on Aid Effectiveness that emphasises harmonisation, division of labour and a sector-wide planning approach. The Vision 2021 is the Government’s articulation of Bangladesh’s development status in 2021 and hence provides the long-term vision, delivered through the 6th and 7th Five Year Plans. The Medium-Term Budgetary Framework indicates how these plans are being operationalised.

The following sections highlight key policies and issues associated to the four pillars introduced in Chapter 1: Natural resources management; Environmental pollution; Climate change; and Environmental governance.

3.2 Policies and Key Issues on Natural Resources Management

National policies stress the benefits that nature provides in terms of ecological balance, ecosystem services, economic growth, anti-poverty measures (such as social protection) and disaster protection. However, an extensive policy framework has not prevented deforestation and forest degradation. Bangladesh’s commitment to protect biodiversity and habitats is at odds with the reality of intensified competition for land and natural resources in what is for now a population-dense, developing country.

Forests, biodiversity, wetlands, and other land issues are now receiving greater attention in various government policies and strategy documents. This includes a **target to achieve by**

2021 tree cover of 2.84 million hectares designated for diversified tree species, species to sustain ecological balance, increasing forestry employment (particularly for women) under expanded social- and agro-forestry, a 'coastal green belt' as sea-protection, and increasing accountability and transparency in public forest management (Perspective Plan, p.31).

The Government intends more efficient management of Bangladesh's vast wetlands, which it views as underutilised and necessary for meeting the increasing demand for fish (PP, p.29). The delta, comprising the Ganges, the Brahmaputra and the Meghna floodplains, is the world's largest flooded wetland, and contains over 800 aquatic species.

The Perspective Plan for Vision 2021 also states Bangladesh's commitment to conserve and enhance biodiversity, whilst recognising its depletion, and the importance of the National Biodiversity Assessment and Programme of Action 2020 (PP, p.96). Bangladesh has been in process of submitting for some time its next National Report to the Convention on Biological Diversity that incorporates national targets and compliance against the Aichi Biodiversity Targets, set at the CBD Conference of Parties in 2010.

3.2.1 Forestry

In Bangladesh, forest resources are important for the country's development and maintenance of environmental balance and biodiversity conservation. Forestry is an important economic and environmental resource, reflected in its 2.93 percent share of GDP with annual growth rates of approximately 5% [check figures] (GoB, 2011).

Summary of key issues:

- The continuing pressure on forest reserves and homestead forests which results in reduced tree cover (CHT, Sundarbans)⁵, encroachment and illegal logging, unsustainable exploitation levels, permanent loss of biodiversity with extinction of wildlife, and a growing list of threatened species of flora and fauna; Dependency of poor farmers on forests for their livelihoods
- The current exploitation of State forests beyond the land's natural productive capacity, rapid deterioration of forest resources, land degradation occurring from misuse, and forest resources that largely remain unproductive⁶;
- The forest products supply/demand imbalances and the inadequacy of community consultation and participation which is undermining development efforts in the sector
- Tenure issues (e.g., encroachment, existence of multiple claims over khas land, insecure tenure, etc.) hinder investments in forests and provide disincentives for sustainable management of trees and land.
- Weak institutional capacities, poor governance, weak law enforcement, political patronization leading to encroachment and illegal logging (Sarker et al. 2011).
- Opportunities for land reclamation, protection from storm surges and carbon sequestration on newly accreted lands (coastal areas) via afforestation
- Participatory forestry approaches as "win-win" for livelihoods and environment

⁵ According to Global Forest Watch, from 2001 – 2013 60,000 ha have been lost (>30% tree cover) and 7,000 gained.

⁶ Approximately 46% of the country's total forests are under formal management plan and nearly 50% are under traditional management plan (BFD 2010, cited in Sarker, 2011).

3.2.2 Biodiversity Conservation

The Government's conservation vision is to improve ecosystem quality through conservation of forests and biodiversity, and to enhance ecosystems service benefits with active community participation (MoEF 2012d).

Bangladesh has high biodiversity but many of the population sizes have declined sharply (DoE 2016, Choudhury, 2015). The main problem is that whilst the country has been able to declare significant areas for conservation, overall the management of these areas has been lacking and unable to address the pressures of socio-economic development. However in recent years some good management practices have been developed in Bangladesh, particularly with USAID support, in several conservation areas, and these will be built upon in this CIP.

The 1973 Wildlife (Preservation) Order and the 1974 Wildlife Preservation (Amendment) Act recognise three categories of Protected Areas – National Park, Game Reserve and Wildlife Sanctuary, defined as:

- National Parks to protect scenery, flora, and fauna in natural states which can be accessed for recreation, education and research.
- Game Reserves to protect and increase the wildlife populations where capturing animals is unlawful.
- Wildlife Sanctuary are undisturbed breeding grounds to protect wildlife inclusive of all natural resources, such as vegetation, soil and water, and are closed to hunting, shooting or trapping of wild animals.

A number of protected areas have been established in Bangladesh including dolphin sanctuaries, botanical garden and eco-parks. As per provision of Environment Conservation Act, 12 areas of the country have been declared as Ecologically-Critical Areas, while the first marine park has been declared in a 1738 km² area of the Bay of Bengal. The types of various protected area call for different levels of protection and utilization, but one common theme is the importance of local communities in protected area management.

The Ecologically Critical Areas, declared under the 2005 Environment Conservation Act, to protect ecosystems that are threatened or in critical state due to environmental degradation, which the Environment Department has legal authority to do by notification in the Official Gazette.

Community Conserved Areas also exist in some areas, and they are highly pressured (Islam et al. 2010; Roy 2000). Eco-parks and safari parks have been created on Reserved Forest Land for recreational rather than conservation purposes. The numbers of conservation areas are shown in Table 1.

Table 1: Number of conservation areas in Bangladesh

Forest Protected Areas	34
Ecologically Critical Areas	12
Eco-Parks	5
Safari Park	1

Source: Islam et al. 2013

Bangladesh accepts Aichi Biodiversity Target 11 of the Convention on Biological Diversity to designate 17% of terrestrial and inland water, and 10% of coastal and marine areas as Protected Areas by 2020 (MoEF 2012d).

The Government's assessment against the IUCN classification of protected areas reports that protected areas cover terrestrial and inland water areas by 6.8% (1.00 million hectares) and coastal and marine areas of 6.2% (0.91 million hectares) – MoEF (2012d).⁷ These figures are far larger than estimates reported elsewhere by others (e.g. IRG 2012 and Islam et al. 2013, which both put the conservation area as under 2%).

Bangladesh's newest Marine Protected Area called the Swatch of No Ground, created in October 2014,⁸ is a spawning and breeding ground for cetaceans, including dolphins, whales, porpoises and sharks, and is the first PA off the coast, covering 173,800 hectares in the Bay of Bengal, with an average depth of 900 metres over a submarine canyon. The protected area restricts fishing and other offshore activities.

In addition, the Sundarbans Integrated Resource Management Plan has proposed to extend the Sundarbans protection by 12 nautical miles into the Bay of Bengal for marine conservation, over an area of 160,300 hectares.

Around 85% of the abovementioned total conservation areas are forests and under the lead responsibility of the Forest Department (95% of terrestrial and inland water, and 72% of coastal and marine) – and the remainder areas fall under the Environment Department and other agencies like the Fisheries Department.

Summary of key issues:

- Threats to biodiversity arise from loss of habitat, deforestation, inappropriate water and agricultural management, and natural disasters.
- Elements of institutional capacity constraints include conflicting and fragmented policies and mandates within government agencies, and a long-standing focus on production at the expense of conservation and sustainable management [add brief discussion].
- Inadequate dialogue, collaboration and capacity of various stakeholders (policy makers, government departments, private sectors, non-governmental organizations, development partners, and local communities) result in ineffective enforcement and development of alternative livelihood opportunities.

3.2.3 Wetlands, water bodies and marine ecosystems

Bangladesh's enormous and varied network of aquatic ecosystems, covering around 2 million hectares, includes:

- freshwater wetlands, locally called *baors* and *jheels* (oxbow lakes in the meander of a river), beels (in shallow topographic depressions, often marshy), *haors* (in bowl-shaped depressions), swamps, marshes, rivers and canals;

⁷ The 0.91 million hectares stated here includes 0.74 reported in MoEF (2012d) plus 0.17 million hectares of the Marine Protected Area created in 2014 called the Swatch of No Ground.

⁸ Created under the 2012 Wildlife (Conservation and Security) Act

- saltwater wetland: mangroves, tidal mudflats, brackish lagoons, coral reefs, shorelines, and beaches;
- human-made water bodies: fish and shrimp ponds, irrigated land, and salt pans;
- palustrine wetlands (include any inland wetland which lacks flowing water, contains ocean-derived salts wetlands) and lacustrine wetlands (Wetlands around lakes and reservoirs).

These are home to hundreds of species of freshwater fish, shrimps, turtles, snails, and wetland flora, and provide livelihoods, fish, honey, materials and fuel for millions of people. Around three-quarters of animal protein consumption in Bangladesh is from fish, particularly amongst the poor. Wetlands also contribute to ground water recharge, flood protection and carbon storage.

Inland capture fisheries are an important source of fish production – though Bangladesh is the fourth highest producer worldwide, inland capture levels has been declining for some time due to overfishing, pollution and inadequate institutional capacity. In the decade from 1985, natural carp spawn catches declined by 75 percent, and are now negligible, and major carp and large catfish have declined by half (USAID 2010). More than 40 percent of Bangladesh’s freshwater fish species are threatened with extinction (IUCN Bangladesh 2000). The 1998 Wetland Policy incorporates sustainability principles, but this has been weak in practice.

Symptoms of degraded wetlands include (MoP 2015):

- Lost fish habitat, population and diversity.
- Reduced wildlife including birds, reptiles and mammals.
- Loss of indigenous aquatic plants, weeds and shrubs.
- Loss of natural soil nutrients.
- Increase in flashfloods.
- Loss of surface water reservoirs.

In addition, Bangladesh’s marine area is about 220 million hectares, including a 710 km coast line. The Bay of Bengal has rich biodiversity, but relatively low biological productivity (Hossain et al. 2015). Marine resources include fish, aquaculture, mangroves, sea salt and ecotourism – and potentially oil, gas, minerals, renewable energy and marine biotechnology. Freshwater fauna diversity totals over 385 species. About 30 million people, around a fifth of the population, are dependent on marine sector for activities like fisheries, aquaculture, tourism, shipping, shipbuilding, ship decommissioning, and offshore oil and gas (Hossain et al. 2015).⁹

Summary of key issues:

- Overexploitation - overfishing, harmful fishing practices, unregulated access, short-term leasing, unplanned infrastructure construction;
- Physical degradation due to siltation, industrial and agro-chemical water pollution and salinity. Some wetlands are disappearing due to a lack of upstream water flow and are being shifted to other uses.
- River erosion results in the significant loss of productive land and vegetation and contributes to keep poor households into poverty. A Delta Plan baseline study estimates

⁹ It is worth noting the 2014 settlement of the maritime boundary dispute with India and Myanmar, and which allocated Bangladesh rights over a greatly increased area of the Bay of Bengal.

that some 6,000 hectares of river bank erosion occur annually in Bangladesh, leading to the displacement of 50,000 people (GED 2015b).

Management of the marine ecosystem has been perceived to be selective. Coastal zone policies and plans, now dating back a decade, have not been implemented well. Progress has been hampered by a lack of coordination, insufficient scientific understanding and inadequate human resources.

With regard to inland aquaculture, shrimp production in the coastal zone has created a special set of environmental and natural resource issues such as drainage, flooding, and introduction of salt water. Tensions over land use have also been associated with the rapid growth of the shrimp for export sector.

3.2.4 Groundwater

A decline in surface water availability in the dry season, combined with increasing water usage is contributing to groundwater over-exploitation, with yields falling and the water table declining by 3 meters a year in some places. Groundwater extraction for drinking water may also be contaminated with naturally occurring inorganic arsenic under certain geological conditions (GOB, 2016). During the dry season, groundwater tables go beyond the suction limit in many parts of the country. This results in reduced access to drinking water. Excess saline groundwater further limits household water supply in the southern districts.

Initial estimates suggest the textile industry may be consuming almost as much groundwater as the capital city's 12 million inhabitants. Over 95 percent of Washing, Dyeing and Finishing (WDF) units are concentrated near rivers, canals, and water bodies in Bangladesh's two major cities, Dhaka and Chittagong, primarily to dispose of large volumes of wastewater daily. Aside from a few dozen WDFs units in the eight export-processing zones, most firms tend to be concentrated in informal, heterogeneous, underserved industrial clusters. These impacts include the over-exploitation of fresh groundwater resources and the pollution of water bodies, and, to a lesser extent, pressures on energy supplies and associated emissions (GOB, 2016).

The government has laid special emphasis on the increased use of surface water and reduced use of groundwater in irrigation to protect the ecological balance and reduce irrigation expenses. The Government stresses a conjunctive use of surface and groundwater. As part of this strategy creation of water reservoir/ rain water harvesting in rain fed/coastal/hilly areas will be encouraged, and small scale water resources systems will be developed along with monitoring the maintenance of the small scale water resources infrastructure at local levels by ensuring community participation and taking care of environmental and social issues.

3.2.5 Other land use issues

Various efforts have been made to apply some form of land zoning in Bangladesh, with regulations on which areas are suitable for certain forms of economic activity. One pending act – which may prove difficult to implement – involves prevention, by law, of the conversion of prime agricultural land for other economic purposes. Significant amounts of land are classified as government (or 'khas') land. This land may be occupied illegally by those who have no land – who are often the displaced victims of lateral river erosion. Land

leasing is generally controlled by the Ministry of Land, through the Assistant Commissioner land, at Upazila level.

Summary of key issues:

- The increasing population and landlessness, and the resultant tremendous pressure of land fragmentation and land-use conflicts which continue to erode resources in the sector;
- The insufficient Government attention to the sector, as a result of which policies, law enforcement, land tenure and legislation, research and management practices are inappropriate and redundant [add some discussion].

3.3 Policies and Key Issues on the Environmental Pollution

The population of Bangladesh of approximately 160 million inhabitants and an economic growth of around 6% for the past several years are putting significant pressures on the natural environment with impacts on human health and livelihoods. Although Bangladesh has several policies and action plans to counter environmental degradation, the status of the environment management is worrisome.

Bangladesh has about 230 small and large rivers and many people depend on them for living. Rivers are also used for transport and contrast salinity intrusion in the South. However, especially in the proximity of cities, the water in many rivers is heavily contaminated with toxic waste, sewage water and industrial effluents and agricultural chemicals (including POPs). According to an article in Reuters (2009), one of the largest rivers in Bangladesh, the Buriganga, is biologically dead (cited from Khawaja Minnatullah, a World Bank specialist on environment and water management). Furthermore, the water may pose a serious threat to public health.

According to the World Health Organisation Bangladesh ranks fourth amongst 91 countries for worst air quality. The gaseous pollution include carbon monoxide (CO), sulphur dioxide (SO₂), oxides of nitrogen (NO_x), ozone (O₃) and particulate matter (PM₁₀, PM_{2.5}). It is estimated that about 70,000 people in 2013 died due to ambient air pollution in Bangladesh¹⁰. These estimates have been growing steadily over time (30,900 in 1990, 38,800 in 1995, 42,600 in 2000, 51,000 in 2005, 65,000 in 2010).

Poor waste management of household, industrial, medical and e-waste belong to another category of environmental threats with significant impacts on livelihoods (particularly in cities) and affects the natural environment. Poor waste management also leads to higher risk of diseases and affects the drainage capacity of rainwater due to clogging waste in drainage systems.

Environmental pollution also has a significant economic impact. For example, the health impacts of air and water pollution have been estimated at 1-3% of GNI annually due to mortality, morbidity, lost productivity and additional burden to the health system (see, for example, World Bank 2006). The “polluter pays principle” is mentioned in policy but weakly applied, with the cost of negative externalities of environmental pollution being paid by society. Also losses of income due to damaged ecosystem services and loss in biodiversity

¹⁰ Global Burden of Disease Study (2013). Accessible at: <http://ghdx.healthdata.org/global-burden-disease-study-2013-gbd-2013-data-downloads>

(e.g. decreased quality of mangos due to air pollution and losses of fish supplies due to water pollution) are examples of how the society financially suffers from environmental pollution. Negative externalities pose a cost on society also in terms of loss of aesthetic value of the nature with negative consequences on the potential ecotourism development.

Bangladesh has recognised environmental concerns for a long time. The first environmental policies were already developed in the 1970s. Later, the National Environmental Policy (1992) and the National Environmental Management Plan (1995) focused on better management of scarce resources, reducing the rate of environmental degradation, improving the natural and manmade environment, conserving habitats and biodiversity, promoting sustainable development and improving quality indicators of human life. The Environmental Conservation Act and Rules (1995) places specific emphasis on industrial water pollution and has set waste discharge quality standards. In the year 2000, Bangladesh also established environmental courts under the Environmental Court Act 2000. Moreover, sectoral policies such as the National Water Policy (1999) or the Water Act (2013) are also in place to regulate water resources, water quality, sanitation, fisheries and participation of local communities in water sector development.

Already in the 6th Five Year Plan actions were taken to address pollution by the ship-breaking industry and brick kiln industry. These industries have not completed cleaning up, and so further actions are needed.

The 2015 Ship Recycling Bill, approved by Cabinet and due to go before Parliament, is intended to ensure safe working conditions, better waste management and environmental protection, and will set up a Bangladesh Ship Recycling Board to monitor the sector. The 2013 Brick Making and Kiln Establishment (Control) Act facilitates establishment of units with cleaner technology, and further work is needed to complete the process.

A targeted approach has given results. Reviewed policy documents and extensive consultations with experts and governmental officials led to the identification of the following key issues:

- Weakly planned, regulated and enforced industrial development
- Insufficient capacity for awareness raising, promoting law compliance, and development of effective policy instruments
- Insufficient capacity to monitor environmental performance and link environmental information to policy decision making
- Pace of economic growth outpaces capacity to address growth-induced environmental issues
- Low political attention to environmental issues when compared with attention to economic growth

The following areas were also identified as needing further investments:

- Reduction of industrial pollution and the ship-breaking sector, and preventing damage from oil spills into the marine environment
- Reduction of municipal and household pollution including waste- and sewage water management
- Reduction of agricultural sources of pollution via improved management practices and addressing other sources of pollution (e.g. removal and rehabilitation of old pesticide storage facilities).

3.4 Policies and Key Issues on Climate Change

Bangladesh is one of the most climate-vulnerable countries in the world and is predicted to be one of the most affected by climate change. Most of the negative effects of climate change (e.g. sea level rise, extreme weather events, variable rainfall patterns, temperature rises), affect both ecosystems and people in rural and urban areas. Climate change models for Bangladesh suggest that the effects are likely to be quite complex, and will require a number of different strategic efforts to address them.

According to Germanwatch (2015) which compiles the Climate Risk Index based on the impacts of extreme weather events¹¹ in various countries, Bangladesh suffered the annual loss, on average over the 1995-2014 period, of over 700 lives, almost \$2.5 billion or 0.86% of annual GDP.

The Government of Bangladesh recognizes that tackling climate change requires an integrated approach involving a number of different ministries and agencies, civil society and the private sector. Under the leadership of MoEF, the GoB prepared a National Adaptation Programme of Action (NAPA) which was launched in 2005 and updated in 2009. The plan identifies priority activities to provide a response to urgent and immediate adaptation needs.

Bangladesh was one of the first countries to introduce a climate change strategy and action plan (BCCSAP, 2009). The BCCSAP will run through 2018 and its revision is being planned. It was also one of the first to set up – using government resources – a fund to support climate change adaptation projects at local level (the Bangladesh Climate Change Trust Fund). The GoB appreciates that not only capacity building and disaster management but also institutional and infrastructure strengthening, development of research and low carbon technologies are of importance in addressing climate change.

BCCSAP (2009) identified six thematic areas, namely (1) food security, social protection and health, (2) comprehensive disaster management, (3) infrastructure, (4) research and knowledge management, (5) mitigation and low-carbon development, and (6) capacity building and institutional strengthening. This action plan will need to be updated post Paris 2015, but the current version is used as a core guide for the relevant pillar (pillar 3) of this CIP (see annex).

The GoB has made climate change an integral part of the 7th 5 Year Plan and lays the foundations for continuing efforts to achieve the Sustainable Development Goals (SDGs). The GoB has given climate finance a high priority and mobilized significant funds from its own budgetary resources. Between 6% and 7% of its annual combined development and non-development budget budgets have been allocated to climate sensitive activities (GoB 2012). It established a Climate Change Trust Fund (CCTF) with \$385 million, which focus is mainly on making resources available for adaptation efforts. The international community has also demonstrated strong support to complement the GoB efforts through the establishment of the Bangladesh Climate Change Resilience Fund (BCCRF), the Pilot Program for Climate Resilience (PPRC), and numerous other bilateral initiatives. Bangladesh is also looking beyond its borders to find common cause with neighbouring countries to manage climate change impacts through regional action plans. Adaptation to climate change will place a

¹¹ Climate change-related risks stemming from extreme events such as extreme precipitation, and coastal flooding, can already be observed as stressed since the 2014 Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

massive burden on Bangladesh's development budget and international support and investments will be essential to help us rise to the challenge (GoB, 2010).

Climate change budgeting exercises have been done for fiscal years 2009/10 to 2013/14. The exercises mainly focused on budgetary accounting. Some correspondence to policy was indicated because expenditures were disaggregated to the six pillars in the Bangladesh Climate Change Strategy and Action Plan. However no link was made from investments to results indicators. The GoB's ambition is to elaborate a Climate Fiscal Framework tying together climate expenditures, financing demands and revenues into national planning and budgetary systems (MoF 2014). Opportunity exists because the Ministry of Finance is revising its Chart of Accounts (budget and expenditure classification) and formats of financial reports (Islam 2012). To assist classification of the public accounts, the MoF has proposed the development of a Climate Expenditure Tracking Framework, a database tool attached to the Computerized Budget Database at the MoF and the Computerized Accounts Consolidation System at the Office of the Controller General of Accounts (MoF 2014).

Besides the BCCSAP, policies on climate-related water infrastructure such as flood control embankments, polders, dykes, roads and bridges are also mentioned under the Bangladesh Environmental Impact Assessment guidelines for Industry. The MoEF has also developed a Gender Action Plan for BCCSAP in 2013 (MoEF 2013).

Reviewed documents and extensive consultations led to the identification of the following key issues which closely link to the BCCSAP thematic areas:

- Disaster risk reduction with in particular on the maintenance and improvement of early warning systems, strengthening climate resilient infrastructure and improve risk management against climate change associated losses (see theme 2 of BCCSAP)
- Sustainable water resources management on strengthening embankments and other water works, develop climate proof water management system and further development of irrigation schemes to increase resilience towards extended periods of droughts (see theme 3 of BCCSAP)
- Climate change mitigation with a focus on sustainable forests management for carbon sequestration, establishment and implementation of climate smart technologies and the promotion of low emission practices from the agricultural sector (see theme 5 of BCCSAP)
- Increase resilience of climate change related risks at community level (see theme 6 of BCCSAP).

Themes 4 and 6 of the BCCSAP that deal with research, knowledge management, and capacity strengthening are addressed in the CIP in a dedicated pillar on environmental governance¹².

3.5 Policies and Key Issues on Environmental Governance

The quality of governance and the functioning of government institutions often determines whether natural resources are used efficiently, sustainably and equitably, and whether countries achieve development goals which depend on natural resources (MoEF 2007, Hasan et al. 2015). Poor governance has ripple effects and often reflects overall weakness in

¹² The development of “climate smart” crop varieties (e.g., water stress tolerant, or requiring a shorter growing cycle) are in the theme 1 of the BCCSAP and addressed in the food security CIP.

governance within a country. Improving governance is high on the political agenda and has received significant attention in the 7th Five Year Plan (GED 2015a).

When compared internationally with other low and lower middle income countries along measures such as ‘Control of Corruption’, ‘Government Effectiveness’, ‘Rule of Law’, ‘Voice and Accountability’, ‘Regulatory Quality’ and ‘Political Stability & Absence of Violence’, Bangladesh’s governance performance has improved but further efforts are needed. When Bangladesh’s performance is compared to Low Income Countries, in 2014 the country ranks above average for three indicators but still trails behind in ‘Regulatory Quality’, ‘Control of Corruption’, and ‘Political Stability & Absence of Violence’ (GED 2015a and World Bank 2016¹³).

In the chapter dedicated to the environment and climate change sector, the 7th Five Year Plan names a number of issues that relate to the need to improve environmental governance. In particular, it highlights that “*Policies to combat pollution are largely ineffective because of loose regulatory practices. Governance elements such as information access, transparency, accountable decision-making, management tools all need improvement. The GoB realizes that environmental policies need to instil market-based incentives to firms to encourage good environmental performance. Access to information and knowledge about risks could greatly reduce the harmful impacts of environmental factors.*” In the sections that refer to climate change adaptation (CCA), the 7th FYP advocates for mechanisms that would allow people’s voice to be incorporated and evaluated in the design of CCA projects.

At present more than 200 laws/bylaws deal with many aspects of the environment. (A list of laws/bylaws related to environmental issues presented in annex). However, the majority of these laws were passed during substantially different population and development conditions. As an example, the Factories Act of 1965 and other health protection laws were designed before industrial pollution and hazardous substance had become serious issues which accompanied the rapid economic development of recent decades. Furthermore, generally accepted principles of environmental justice – such as the precautionary principle or the polluter pays principle - are not widely expressed in Bangladesh environmental laws and regulations.

The Bangladesh Environment Conservation Act, 1995 (amended in 2010) and the accompanying 1997 Rules are the key items of legislation which provide legally binding direction for protection and conservation of the environment, improvement of environmental standards and control and mitigation of environmental pollution.¹⁴

In addition to legally binding instruments, Bangladesh has a large number of sectoral policies, strategies and action plans pertinent to environmental administration (over 60 have been identified). These policies often contain more progressive notions, but as they are not legally binding, they have not tended to give the hoped-for results. The national Environmental Policy first was framed in 1992, in line with the general recommendations of

¹³ <http://info.worldbank.org/governance/wgi/index.aspx#reports>.

¹⁴ The provisions of the Act are related to establishment of the Department of Environment; issuance of Environmental Clearance Certificate; declaration of Ecologically Critical Areas, power to make rules and take legal action and also providing substantive and procedural provisions. The 1997 Rules (Environment Conservation Rules 1997) set environmental quality standards to control quality of air, water, noise, emissions and discharge and categorized all development projects into four classes (Green, Orange-A, Orange-B and Red) according to their potential threat and impact to environment.

the Rio Declaration. Primarily it dealt with the issues protection of biosphere, sustainable use of natural resources, reduction and disposal of wastes, energy conservation, risk reduction, safe products and services, environmental restoration, informing the people, management commitment and assessment. This policy included the provision of institutional structure of environmental governance and formation of National Environment Council and Executive Committee of the Council.

Multilateral Environmental Agreements (MEAs) play a critical role in the overall framework of environmental laws and conventions. Complementing national legislation and bilateral or regional agreements, MEAs form the over-arching international legal basis for global efforts to address particular environmental issues. Bangladesh is signatory of a number of MEAs such as UNFCCC, UNCBD, UNCCD etc. In order to fulfil global commitments under these MEAs, in some cases Bangladesh government has adopted or amended existing legal provisions to align them with such commitments.

The government is proactively creating an enabling environment for the disclosure of public documents with the enactment of Right to Information Act (2009) and the establishment of the independent Information Commission; it is important that the public has access to aid data and project documents to ensure transparency and accountability. This 7th FYP stipulates that all aid data be made public and that the Aid Information Management System (AIMS) should be the principal means of data sharing by DPs in Bangladesh. (7FYP). The Plan also notes that progress in areas relating to e-governance, the Right to Information (RTI), elected local governments, and the medium-term budgetary framework (MTBF) are all indicators of the Government's commitment to improve governance over the longer term (7FYP).

Key issues derived from existing documents and that emerged during consultations:

- Inadequate awareness of issues as well as of existing regulatory frameworks at all levels, including at policy maker level
- Inadequate capacity of legislative and administrative authorities to enforce legal provisions and take necessary actions, to support sustainable management of shared natural resources and address transboundary environmental issues;
- Limited scope of the judicial system to uphold environmental rights of the common people (functional environment courts at local level);
- Lack of knowledge/capacity development on environment protection among people and industrialists, businessmen, importers hinders the enforcement and implementation of environmental instruments. It creates major challenge in implementing MEAs
- Inadequate manpower and organizational setup of Department of Environment is one of major constraints; (set up in 21 districts out of 64 districts, total strength: 735 but 436 working, rest of the posts are vacant)
- Notable coordination gap among relevant ministries/departments on the implementation of environmental policies.
- Inconsistent and unequal enforcement/ application of regulatory frameworks
- Lack of mechanism to mediate/arbitrate among users of different ecosystems services;
- Weak safeguarding of environmental rights for the common people
- Absence of systematic involvement of CSO/CBOs/NGOs/private sector in implementing environmental regulations (large untapped capacities outside GoB)
- Inadequate transparency (allocation and use of funds) and accountability

- Insufficient monitoring and information systems for decision making, policy development and implementation
- Modest uptake of Bangladesh's Gender Action Plan for BCCSAP. Notwithstanding significant progress, gender remains an issue and needs more systematic mainstreaming into sector policies.
- Need to develop and strengthen institutional arrangements to support sustainable management of shared natural resources, and address transboundary environmental issues.
- Lack of strategic environmental assessment to integrate environmental considerations into policies, plans and programmes and evaluate their inter-linkages with economic and social considerations.

Chapter 4. Rationale for the Investment Plan

The need for investments in environment, forestry and climate change in Bangladesh are significant (Shaheduzzaman 2013) and are bound to increase because of economic growth, population increase, and climate change. Policies and plans exist, but their implementation is weak. Inadequate inter-agency coordination is repeatedly mentioned as an issue and an obstacle in the 7th FYP. The 2015-2016 ADP lists about 130 projects that can be categorized as attending to these needs. However, the design and implementation of these projects takes place with limited coordination across Ministries and agencies with the resulting effect that opportunities for synergies and complementarities are missed.

A similar situation affected Bangladesh food security in 2010 when the government decided to develop and implement a country investment plan in agriculture, food security and nutrition in support of the National Food Policy and Plan of Action. The plan proved helpful to improve information sharing, coordination, and resource mobilization in under-invested areas.

Bangladesh does not have a framework which links environmental policies, investments and results within a set time-span. The GoB decision to develop a Country Investment Plan (CIP) aims to facilitate enhanced planning, implementation, coordination and – most importantly - **monitoring** of investments in the EFCC sectors. The CIP should also help to mobilize and target new resources where they are most needed

Hence, the CIP should be read as a cross-sectoral strategic framework to guide national and international investments for the environment, forestry and climate change sectors, and to coordinate implementation with all of the sector's stakeholders.

The investment plan will help to:

- Provide the framework for formulating, financing and implementing EFCC projects and programmes in alignment with national priorities;
- Translate national priorities into realistic and achievable targets and objectives;
- Mobilise public and private investments on Bangladesh's environmental challenges;
- Improve GoB public finance effectiveness on environmental issues through increased coordination amongst Government agencies, Development Partners and other stakeholders such as the private sector, NGO's etc;
- Define the roles and responsibilities of actors; and
- Provide a framework to monitor and evaluate investments with a view to improve implementation and recommend remedial measures to activities that require strengthening.

The CIP offers an approach to integrate natural resources management, environmental and climate smart concepts, and for the development of human and institutional capacity to improve programmes in the EFCC sectors in a sustainable manner.

Main expected benefits

Economic and social:

The main economic and social benefits expected from programmes under the CIP include: (i) increased incomes resulting from increased productivity, production from the natural resource base such as agricultural land, forests, wetlands, etc; (ii) improved access to research and extension support, markets and market information; (iii) enhanced access to rural financial services; (iv) increased market opportunities and returns from smallholders' activities and investments in agriculture, forest and aquaculture, such as processing and marketing; (v) improved equity in the management of natural resources.

Environmental:

Environmental benefits will be derived from sustainable natural resources management, and include: (i) improved sediment retention and flood control, (ii) improved land management (iii) improved access to water; (iv) integration of conservation and other climate smart techniques (v) protection and rehabilitation of wetlands and conservation of indigenous plant species; (vi) increased carbon sequestration; and (vii) positive environmental outcomes expected from sustainable agro-forestry based enterprises such as more energy-efficient production and –to a lesser extent- safer disposal of agro-industrial waste.

Institutional

Institutional benefits expected from the CIP include: (i) Central and decentralized government agencies more effectively planning, coordinating and monitoring development interventions in the EFCC sectors; (ii) Improved legislation and law enforcement (iii) enhanced development partners and other stakeholders coordination resulting in more effective decision making and reducing transaction costs; (iv) Research and training institutions are delivering increased knowledge products for improving the EFCC sectors.

Chapter 5. The overall goal and structure of the CIP

5.1 Overall goal

The overall goal of the CIP is to increase the contribution of the EFCC sectors to the sustainable development of the country through the enhanced provision of ecosystem services thereby helping to reduce poverty, improve environmental and human health and increase resilience to climate change.

The CIP is designed to help the Government realise its policy objectives by guiding investment choices in their Annual Development Programs (ADP). The CIP is organized in four main investment areas or “pillars”:

- 1. Sustainable Development and Management of Natural Resources*
- 2. Environmental Pollution Reduction and Control*
- 3. Adaptation, Mitigation and Resilience to Climate Change*
- 4. Environmental Governance, Gender & Human and Institutional Capacity Development*

The CIP adopts a hierarchical structure, as follows: Pillars represent the strategic priority areas for investment in the EFCC sectors for a five year period. In each Pillar, several areas are identified as key areas for intervention. These are called the Programme areas. Each Programme consists of a number of sub-programmes that describe what is planned to be achieved in manageable costing areas. Hence the sub-programmes represent possible ingredients that can be combined as needed to develop investment projects.

Pillar 1: Sustainable Development and Management of Natural Resources	
Programmes	Sub-programs (priority areas of intervention)
1. 1: Sustainable management of and socio-economic benefits from forests enhanced	1.1.1. Social forestry, reforestation, afforestation, coastal green belt development, landscape restoration, and other agro-forestry practices*
	1.1.2. Improve forest monitoring (to include both bio-physical and socio-economic aspects) - GIS & RS Based Forest Management)*
	1.1.3. Small and medium forest enterprise and value chains development for socio-economic benefits, food security and employment creation (e.g., promotion of ecotourism and environmental services, financial services, certification, marketing of forest products and services)*
	1.1.4. Improve security of land tenure, stakeholder awareness and capacity *
1.2. Biodiversity conservation	1.2.1. Develop and enhance conservation of protected areas through joint government-community co-management*
	1.2.2. Improve biodiversity monitoring (including strengthen monitoring capacities of institutions)*
	1.2.3. Endangered species conservation and management (e.g. Implementation of Tiger Action Plan)
	1.2.4. Support implementation and scaling up of the Integrated Resources Management plan for the Sundarbans 2010 - 2020
1.3. Sustainable management of wetlands and rivers	1.3.1. Support implementation and scaling up of the Master plan for Haor and flood prone areas*
	1.3.2. Support implementation and scaling up of the Aquaculture development strategy and action plan
	1.3.3. River water quality improvement
1.4. Other Sustainable Land and Water Management	1.4.1. Improved soil fertility and groundwater management in North-North West Bangladesh
	1.4.2. Managing Soil Erosion in Hilly Areas
	1.4.3. Managing Coastal Land, preventing and coping with waterlogging and salinity
Pillar 2: Environmental Pollution Reduction and Control	
Programmes	Sub-programs (priority areas of intervention)
2.1. Reduced industrial pollution (including shipwreck dismantling)	2.1.1. Support adoption of cleaner production and end-of-pipe technologies in industrial processes like brick kilns, textile, leather industry, etc.
	2.1.2. Prevent, reduce, and mitigate damages to natural ecosystems from oil spills and drilling
2.2. Reduced municipal and household pollution	2.2.1. Improve collection, management and treatment of solid waste (e.g. household, medical waste at municipal and cross-municipal level)
	2.2.2. Improve supply of safe drinking water to urban and rural communities
	2.2.3. Increase collection and treatment of sewage water and drainage water
	2.2.4. Improve sanitation at community level
2.3. Reduced pollution from agriculture and other sources	2.3.1. Minimize pollution from fertilizers and pesticides*
	2.3.2. Support to the Bangladesh National Implementation Plan for Management of Persistent Organic Pollutants (POPs).

Pillar 3: Adaptation, mitigation and resilience to climate change	
Programmes	Sub-programs (priority areas of intervention)
3.1. Disaster risk reduction*	3.1.1. Support the development of early warning systems
	3.1.2. Strengthening climate change resilient buildings, roads and storage facilities
	3.1.3. Risk management against loss on income and property
3.2: Sustainable infrastructure development	3.2.1. Strengthening coastal and inland embankments and improve drainage capacity
	3.2.2. Support for operation and maintenance of water management*
	3.2.3. Support the development of irrigation schemes (drought-prone areas)*
3.3: Mitigation and low carbon development	3.3.1. Support climate smart technologies for industry and power generation
	3.3.2. Promotion of low cost transport and low emission vehicles
	3.3.3. Promote low emission from agriculture*
3.4. Increased resilience at community level*	3.4.1. Develop community adaptation through CBA and EBA*
	3.4.2. Scaling-up local innovations on adaptation*
Pillar 4: Environmental Governance, Gender and Human and Institutional Capacity Development	
Programmes	Sub-programs (priority areas of intervention)
4.1. Improved legislative, regulatory and policy framework for the EFCC	4.1.1. Strengthening the regulatory framework for EFCC (including pollution prevention & control)*
	4.1.2. Improving Enforcement and Application of Regulatory Frameworks*
	4.1.3. Support to rational arbitration among users of ecosystems services
	4.1.4. Improved formulation, coordination and implementation of policies in the EFCC sectors*
4.2. Improved stakeholder participation and Gender Equity in EFCC *	4.2.1. Development and Strengthening of mechanisms for stakeholder participation in EFCC policy development and implementation*
	4.2.2. Gender equity, empowerment and inclusiveness of minorities in EFCC sectors*
	4.2.3. Support to producers organization, rural communities, groups, etc.*
4.3. Improved transparency, organizational processes and knowledge for evidence based decision making*	4.3.1. Support to information management systems for data collection, use and dissemination for improved budget planning, implementation, monitoring and evaluation*
	4.3.2. Support to implementation of the EFCC Research Master Plan and Training Plan*
	4.3.3. Establishment of a centre for knowledge management and training on environment, forestry and climate change*
	4.3.4. Support to Knowledge Systems, including Research Organizations, Extension and Education, NGOs in EFCC*

(*) Gender is in description and results framework

Chapter 6. The Bangladesh EFCC Investment Plan

6.1 Pillar 1: Sustainable Development and Management of Natural Resources

Pillar objective

The majority of the population of Bangladesh is dependent to some extent on natural resources for their livelihoods; hence sustainable utilisation of such resources is very important for the country. The overall objective of Pillar 1 is the sustainable management and use of natural resources including land, surface and groundwater, forests and biodiversity which produce the ecosystem services from which people benefit. The expected outcome is the enhanced provision of ecosystem services from natural ecosystems.

By improving the management of natural resources, the pillar will enhance the quantity and quality of forests, biodiversity, wetlands and other resources available; the resilience of communities; and will increase employment and income generation activities to the benefit of rural communities and in particular vulnerable groups. In addition, communities would benefit from improved (better) co-management of biodiversity and conservation areas as well as the sustainable management of natural and man-made wetlands and adoption of sustainable land management practices. Communities would also benefit from up-scaling of specific practices such as agro-forestry, small enterprise development and ecotourism, supported by improved access to financial services.

The Pillar comprises four inter-related programmes:

Programme 1.1. Sustainable management of and socio-economic benefits from forests enhanced

Programme 1.2. Biodiversity conservation

Programme 1.3. Sustainable management of wetlands and rivers

Programme 1.4. Other sustainable land and water management

Programme 1.1. Sustainable management of and socio-economic benefits from forests enhanced

During consultations, stakeholders agreed that forests provide important socioeconomic benefits to the rural populations that live in their vicinity. Such benefits can be improved with better information about the resource base and the services it provides, improving the enabling environment for the development of forest enterprises, and better forest management. Stakeholders agreed that support is required to strengthen human capacities of key stakeholders, such as the Forest Department, other key agencies, and communities involved in social forestry and co-management arrangements. Research and extension activities also need to be supported.

The main objective of this programme is to improve forest management and increase the socio-economic benefits from forests through employment creation, income generation, and the enhanced provision of carbon sequestration, water, soil -and biodiversity conservation.

The programme consists of four sub programmes:

<i>1.1.1. Social forestry, reforestation, afforestation, coastal green belt development, landscape restoration, and other agro-forestry practices*</i>
<i>1.1.2. Improve forest monitoring (to include both bio-physical and socio-economic aspects) - GIS & RS Based Forest Management)*</i>
<i>1.1.3. Small and medium forest enterprise and value chains development for socio-economic benefits, food security and employment creation (e.g., promotion of ecotourism and environmental services, financial services, certification, marketing of forest products and services) *</i>
<i>1.1.4. Improve security of land tenure, stakeholder awareness and capacity</i>

Sub-programme 1.1.1. Social forestry, reforestation, afforestation, coastal green belt development, landscape restoration, and other agro-forestry practices

Activities like afforestation/reforestation, reduction of deforestation and forest degradation, and sustainable forest management provide not only climate change mitigation and adaptation benefits but also substantial co-benefits in terms of employment and income generation opportunities, biodiversity and watershed conservation, provision of timber and fibre as well as recreational services. Social forestry is an important means to manage, protect and conserve forest resources. It also provides important livelihoods opportunities for local communities and offers good entry points for women’s empowerment. Bangladesh has a long tradition in social forestry. This participatory approach to forestry can be enhanced by supporting communities improved site selection and zoning, improved nurseries, and better resource extraction planning. Coastal green belt development is an important intervention to stabilize coastal areas and increase their protection from storms and cyclones.

This sub-programme will support initiatives on: (i) Enhancement of the Forest Department’s planting capacity (including supply of genetically improved nursery stock, maintenance and supervision); (ii) co-management of forests, participatory afforestation (social forestry, including plantation in marginalized lands), livelihood support (including homestead forestry) for forest dependent communities; (iii) afforestation/reforestation in the hills and plain land forest areas; (iv) coastal afforestation and creation and maintenance of coastal green belt (e.g. mangrove plantations); (v) increase declaration of coastal afforested areas (by different stakeholders) as “reserve forest” and (vi) improve social forestry guidelines by highlighting genetic improvement of seedling production, land and species suitability and maintenance operations.

Implementation: Forest Department (Coastal Forest Divisions, Social Forestry Divisions), Ministry of Environment and Forest, Ministry of Agriculture, Ministry of Land, Deputy Commissioner’s Offices.

Sub-programme 1.1.2. Improve forest monitoring (to include both bio-physical and socio-economic aspects) - GIS & remote sensing-based forest management

Forest area change monitoring and remote sensing capacities need to be improved considerably to improve forest governance, protection, conservation, and management. Estimates of the socio-economic benefits from forests are also lacking, leading to a sub-optimal use and conservation of forests.

Initiatives under this sub-programme include support to (i) a national forestry inventory and satellite forest monitoring system that includes both bio-physical and socio-economic (including gender) aspects, (ii) capacity development to implement satellite based monitoring system, (iii) updating the land record and demarcated forest area; and (iv) improve linkages between monitoring data to national statistics, rural development and enforcement initiatives.

Implementation: Ministry of Environment and Forest, Ministry of Land, Statistics and Information Division, Forest Department, Bangladesh Bureau of Statistics (BBS), Land Survey Directorate, Bangladesh Space Research and Remote Sensing Organization (SPARSO), IMED.

Sub-programme 1.1.3. Small and medium forest enterprise and value chains development for socio-economic benefits, food security and employment creation

Ecotourism is a growing industry in Bangladesh and considered as a potential instrument for rural economic development and natural heritage conservation. Ecotourism could be a source of revenue and employment as well as a way to promote historical and cultural education. Care has to be taken that fragile sites of ecological or cultural significance are not exposed to the threat of degradation by unregulated tourism development and over-visitation. In addition, there are many non-timber opportunities to generate revenue from forests. Non-Timber Forest Products (NTFP) such as Bamboo, cane, murta, medicinal plants, honey, wax, golpata etc. appear to hold promise for forestry enterprise development in Bangladesh, especially for women. NTFPs have potential to contribute to poverty reduction, food security and livelihoods improvement. Value chains can also be further developed, for example through improved coordination and more organized marketing of agro-forestry products.

Activities under this sub-programme may include: (i) ecotourism infrastructure and site development; (ii) enterprise/business development (e.g., agar plantations); (iii) support financial services and credit programs for forest/conservation-based enterprise development, with special attention to vulnerable groups including women, (iv) value chain development; (v) Marketing analysis and development; and (vi) Promoting certification and labelling for products that meet established legal, economic, social, and environmental standards.

Implementation: Ministry of Food, Ministry of Civil aviation and Tourism, Ministry of Commerce, BFIDC, Bangladesh Small and Cottage Industries Corporation (BSCIC), Bangladesh Parjatan Corporation, Bangladesh Tourism Board, Bangladesh Standard and Testing Institutions (BSTI), Bangladesh Chemical Industries Corporation (BCIC), NGOs and other private sector organization.

Sub-program 1.1.4. Improve security of land tenure, stakeholder awareness and capacity

Secure tenure represents a significant challenge in Bangladesh (GED 2015a). The existence of multiple claims of khas lands, political patronage, weak enforcement, and complex involvement of multiple public stakeholders (e.g., Ministry of Land, District Administrations, Forest Department, Chittagong Hill Tracts Authority etc.) all contribute to a situation of tenure insecurity that enables encroachment and illegal logging, and provide disincentives for the sustainable management of trees and land. Consultations also pointed to the inadequacy of the existing leasing policies, with their limited attention to environmental aspects, to promote long-term investments in better forest management. Effectively addressing tenure issues of land and trees is a complex task that requires long term attention and political will.

The subprogram may include the following activities: (i) Updating and archiving (digitally and in hardcopies) all the land records of the Forest Department¹⁵, (ii) Analysis of tenure issues (highlighting stakeholder involvement/engagement, land use change, impacts on resources like lands and trees, encroachment and logging) and recommendation for time bound action plans, (iii) Demarcation of forest areas to prevent encroachments, and (iv) Awareness raising programs and capacity strengthening for people and other institutional stakeholders.

Implementation: Ministry of Land, Ministry of Chittagong Hill Tracts Affairs, Chittagong Hill Tracts Development Board, Hill District councils (Rangamati, Bandarban, Khagrachori), Deputy Commissioner’s Offices, Upazila Nirbahi Officer’s Offices, Upazila land Offices

Programme 1.2. Biodiversity conservation

The root causes of biodiversity loss range from natural processes to man-made interventions like climate change, unsustainable use and over exploitation of resources. Threats to biodiversity arise from loss of habitat, deforestation, inappropriate water and agricultural management and natural disasters.

The main objective of this programme is to conserve, and restore the biodiversity of the country through the maintenance and enhancement of ecosystems service benefits with active community participation. The expected outcome is that biodiversity is conserved and maintained.

The programme consists of four sub-programmes:

<i>1.2.1. Develop and enhance conservation of protected areas through joint government-community co-management*</i>
<i>1.2.2. Improve biodiversity monitoring (including strengthen monitoring capacities of institutions)*</i>
<i>1.2.3. Endangered species conservation and management (e.g. Implementation of Tiger Action Plan)</i>
<i>1.2.4. Support implementation and scaling up of the Integrated Resources Management plan for the Sundarbans 2010 - 2020</i>

Sub-programme: 1.2.1. Develop and enhance conservation of protected areas through joint government-community co-management

The protected area will be increased to 5% of the country during the Seventh Five Year Plan period. Bangladesh has continued to expand its conservation areas, creating 9 protected areas in the last 5 years (MoEF 2015). A notable success in tackling some of these issues has been to strengthen co-management with communities. Funding is an important obstacle to strengthening conservation, with very high dependence on limited government allocations and international projects, and little realistic financial planning. Two positive developments have been the Government establishing a recurring budget line for co-management committees in Protected Areas, and, secondly, sharing revenue earnings from non-timber

¹⁵ Land tenure is a very complex issue. The challenges are more than technical. However, updating and archiving land records are important steps to bring more transparency.

forest produce as a financing source for the Sundarbans (MoEF 2012d). However, consultations highlighted the importance to assess existing co-management mechanisms to identify lessons in what has been working and what needs correction.

Under this sub-programme, interventions will be developed to enhance the management of conservation and protected areas including: (i) National Parks, to protect scenery, flora, and fauna in natural states which can be accessed for recreation, education and research; (ii) Ecologically Critical Areas, declared under the 2005 Environment Conservation Act, to protect ecosystems that are threatened or in critical state due to environmental degradation, which the Environment Department has legal authority to do by notification in the Official Gazette; and (iii) Community Conserved Areas as these are under pressure (Islam et al. 2010; Roy 2000).

Specific interventions may include: (i) Improve management of National Biodiversity Conservation Areas, Protected Areas (PAs) and biodiversity hot spots to promote environmental sustainability; (ii) Develop PA/ECA specific protection/ restoration management plan in consultation with local community and implement the plan in a time bound manner. Such plans exist already for nine Protected Areas, but should be developed for other areas too; (iii) Develop management plans for each water body, typically involving fish sanctuaries, closed seasons and bans on destructive fishing methods; (iv) Support Resource Management Organisations (RMOs) and Co-Management Committees (CMCs); (v) Set up Regional botanical garden for uniform biodiversity conservation in the country, and (vi) Restoration of Sal Forest and continuation of reed land planting.

Implementation: Department of Environment, Department of Forest, Divisional Forest Office (Sundarban West), Divisional Forest Office (Sundarban East).

1.2.2. Improve biodiversity monitoring (including strengthen monitoring capacities of institutions)

In terms of both flora and fauna, ecosystems of Bangladesh house a very rich biodiversity. Plant species are composed of 3 Gymnosperms, 1700 Pteridophytes, and 5700 Angiosperms. Among animals, 53 Amphibians, 158 Reptiles, 690 Birds and 121 species of mammals are recorded to exist (Rahman and Rakhimov, 2015). However, this rich biodiversity is at an alarming declining trend and some quick actions with specific result in focus need to be taken. Although a red list of endangered species is maintained by IUCN-Bangladesh, however such a list for plant species is currently absent. Thus a comprehensive biodiversity assessment (with identified hotspots) in the form of a baseline data could be very useful for the country to ensure proper monitoring of biodiversity.

Important Biodiversity monitoring commitments under the CBD include: **<to be completed>**

- identifying and monitoring the components of biodiversity that need to be conserved and used sustainably;
- establishing protected areas to conserve biodiversity while promoting environmentally sound development around these areas;
- rehabilitating and restoring degraded ecosystems and promoting the recovery of threatened species in collaboration with local communities;
- Attention to biodiversity conservation in livestock and fisheries.

Specific interventions under this subprogram may include:

(i) Carry out a biodiversity assessment (with identified components, communities and hotspots) for the country highlighting both flora and fauna; (ii) Set up a well-designed participatory monitoring system (including development of tools and periodic reporting) to evaluate changes in ecosystem and biodiversity, covering all important and sensitive ecosystems (specifically, in the context of REDD+), and (iii) Strengthen institutional and human capacity for monitoring. Additional investments may be needed to implement activities included in the National Biodiversity Strategy and Action Plan (DoE 2016, currently under preparation).

Implementation: Department of Environment

1.2.3. Endangered species conservation and management (e.g. Implementation of Tiger Action Plan)

The 2010 National Biodiversity Assessment Report assessed wild mammals as the most threatened faunal group, and amongst them tigers as highly threatened. The Government prepared the 2009 Bangladesh Tiger Action Plan to address tiger conservation in the Sundarbans.

Under this sub-programme activities will be developed in support of (i) Management of Wildlife Sanctuary and Protected Areas to protect wildlife inclusive of all natural resources, such as vegetation, soil and water, etc.; (ii) Support rehabilitation of the rare, threatened and endangered native, wild and domesticated species, and (iii) Support implementation of the Bangladesh Tiger Action Plan, (iv) Establish a germplasm center for forest and associated species; (v) Management of Game Reserves to protect and increase the wildlife populations.

Implementation: Ministry of Fisheries and Livestock, Department of Environment, Forest Department, Divisional Forest Office (Sundarban West), Divisional Forest Office (Sudarban East), Various Wildlife and Nature Conservation Divisions of the Forest Department.

Sub-programme 1.2.4: Implemented the Integrated Resources Management Plans for the Sundarbans 2010-2020

Bangladesh's most important saline wetland is the Sundarban Reserved Forest. This status means some forms of resource extraction are allowed, but it is illegal for anyone to live, cultivate land, or graze livestock in the forest. To ensure additional protection, three areas within the forest have been designated as Wildlife Sanctuaries and UNESCO World Heritage Sites, totalling 1400 km-square, where all extraction is prohibited.

Securing the future of the Sundarbans will also secure that essential ecological services such as trapping of sediment and land formation, protection of human lives and habitation from cyclones, fish, oxygen production, carbon cycling, carbon sink. Coastal habitats, such as mangroves, sea grasses and salt marshes, can sequester some 50 times the carbon per hectare as tropical forest (USAID 2010).

Under this sub-programme support will be provided to implement and scale-up the Integrated Resources Management Plans for the Sundarbans 2010-2020 in order to improve coordination and contribute to the main outcomes such as maintained health, productivity, diversity and resilience of forests, terrestrial resources, wetlands and aquatic resources. Engagement of local communities and creation of alternative livelihoods is critical.

Implementation: Forest Department, Divisional Forest Office (Sundarban West), Divisional Forest Office (Sundarban East), Department of Environment, Ministry of Home Affairs, Bangladesh Coast Guard.

Programme 1.3. Sustainable management of wetlands and rivers

The main objective of this programme is to ensure sustainable management of all natural wetlands and other water bodies in Bangladesh. The expected outcome is that aquatic biodiversity is conserved and maintained, that wetlands play an improved role in flood prevention, and that these areas provide sustainable livelihoods for the people living in them..

The programme consists of three sub-programmes:

<i>1.3.1. Support implementation and scaling up of the Master plan for Haor and flood prone areas*</i>
<i>1.3.2. Support implementation and scaling up of the Aquaculture development strategy and action plan</i>
<i>1.3.3. River water quality improvement</i>

Sub-programme 1.3.1: Support Implementation and scaling up of the Master Plan for Haor and Flood Prone Areas

The central and north-central Haor region of Bangladesh has long been lagging behind mainstream national development. The GoB has taken many initiatives including the preparation of national and regional strategies to enhance economic growth and has prepared plans to boost the country's development. The 7th Five Year Plan includes reference to lagging regions and leaving no-one behind.

This sub-programme aims to (i) support selected activities in the first phase of the Haor Master Plan and (ii) support the Bangladesh Haor and Wetland Development Board (BHWDB). However, the Haor plans tend to emphasise mainly economic development opportunities. In addition, attention will need to be given to sustainable and equitable development.

Implementation: Bangladesh Water Development Board, Water Resource Planning Organization (WARPO), Bangladesh Haor and Wetland Development Board

Sub-programme 1.3.2: Implemented the National Aquaculture Development Strategy and Action Plan 2013-2020

The National Aquaculture Development Strategy and Action Plan produced by the Department of Fisheries (2013) aims to: “improve the welfare of the resource-poor people depending on the aquatic resources for livelihood, reduce poverty by stimulating employment and improving income, conserve if not enhance the natural resources on which livelihoods are based, promote the sustainable development of rural communities, increase export earnings, and contribute to the creation of wealth for the nation and improvement in the welfare of the people.”

The plan consists of 16 outputs under four strategic objectives: social, economic, ecological and institutional. In particular outputs linked to the ecological objective will contribute to the conservation of the land, water and genetic/biological resources on which aquaculture depends, and will seek to make aquaculture contribute to the conservation of natural resources, in particular fishery resources. One important aspect is to reduce the dependency of aquaculture on wild species as inputs (which are often harvested unsustainably)

Under this sub-programme support will be provided to further implement and scale-up the Aquaculture Development and Action Plan.

Implementation: Ministry of Fisheries and Livestock, Department of Fisheries, Ministry of land, Deputy Commissioner's offices, Upazila Fisheries Officer's office

Sub Programme 1.3.4. River water quality improvement

Partially treated and untreated liquid waste disposal from a series of industries situated along a single river often exceed the assimilative capacity of the river. For example, it is estimated that 22000 cubic meters of untreated effluent, including chromium, is dumped daily into the Buriganga River (GED 2015a). Thus, it is imperative that investment plans to improve the river water quality are adopted considering the assimilative capacity of the same. In addition, surface water source protection should be also be ensured through Waste Load Allocation. A pilot investment programme should be developed for the Buriganga-Balu-Shitalakhya channel that is considered as the most polluted river channel in the country.

The sub-programme may include the following activities: (i) assessing the Total Maximum Daily Load the river can receive given its morphological, hydrodynamic and environmental status, (ii) removing accumulated waste in the river beds, (iii) waste load allocation of the rivers and restricting Industries, POTWs along riverbanks, (iv) strengthening data generation and analysis capacities to help negotiations on trans-boundary river issues.

Implementation: [to be added]

Programme 1.4. Other Sustainable Land and Water Management

During consultations, divisional stakeholders have mentioned the importance to address degradation of natural resources in a wide range of other contexts (outside of the main forests and wetlands). This occurs when the resilience and adaptive capacity of the natural resource base is compromised. It can be seen in loss of soil fertility, soil erosion, as well as in siltation in water courses, salinization and water logging¹⁶.

The main objective of this programme is to ensure that land and water resources are effectively managed, leading to an increased capacity to conserve biodiversity, regulate water and nutrient cycles, sequester carbon, and provide livelihoods.

¹⁶ Under current hydrological and water use conditions, the recharge period is shorter compared to discharge (flow from aquifer to river) except Jamuna (Bangladesh Integrated Water Resources Assessment Supplementary report, Surface and Groundwater Interaction, March 2014, IWM)

[Add something on the importance to improve management of river bank erosion, mentioning the need for institutional innovation for better coordination among service giving agencies and participation of local stakeholders]

This programme consist of 3 sub-programmes:

<i>1.4.1. Improved soil fertility and groundwater management in North-North West Bangladesh</i>
<i>1.4.2. Managing soil erosion in hilly areas</i>
<i>1.4.3. Managing coastal land, preventing and coping with waterlogging and salinity</i>

Sub-programme 1.4.1 Improved soil fertility and groundwater management in North - North West Bangladesh

The North and North West region of Bangladesh is an area which has been the source of Bangladesh's Green Revolution over the past 30 years. Driven by tubewell irrigation, and adoption high yielding varieties, greater use of fertiliser and pesticides, given added impetus by mechanisation, yields have increased spectacularly, such that the irrigated winter crop is now the main source of food production nationally. However, although rainfall is generally abundant, and aquifers recharge, some areas have seen over-extraction of ground water, and falling levels of accessible water. At the same time, some of the key indicators of soil fertility (such as soil organic matter percentage) are falling, and suggestions that fertiliser response is reduced. Neighbouring countries who adopted such technologies earlier than Bangladesh are experiencing major problems due to unsustainable natural resource use in the agro-ecosystem. Government response in Bangladesh has been to pilot schemes for water pricing, and to encourage a diversification of cropping away from rice, to maize and "less water-loving" crops.

This sub-programme will include actions such as: (i) inventory of ground water resources and development of guidelines for their efficient use; (ii) surface water augmentation; (iii) development and implementation of new water conservation technologies and practices; (iv) programmes for enhanced soil fertility management, including conservation agriculture and (v) conduct an assessment to the opportunities of artificial and natural groundwater recharge.

Implementation: Bangladesh Water Development Board, Department of Public Health Engineering (DPHE), Department of Agriculture Extension (DAE), Bangladesh Rural Development Board (BRDB)

Sub-programme 1.4.2 Managing Soil Erosion in Hilly Areas

The Chittagong Hill Tracts covers approximately 10 per cent of the land mass of Bangladesh. The terrain is hilly, rising to over 1000 m above sea level. The area is characterised by forest and shifting cultivation on the slopes, and conventional agriculture in the valley bottoms. The area receives abundant rainfall during the monsoon, but the winter months are dry. The physical geography of CHT is dominated by lake Kaptai which was flooded in the early 1960s. The resultant population displacement caused added population pressure on land used for shifting cultivation, with fallow periods shortened from 12-15 years, down to 2-3 years. This – along with large scale illegal and/or unregulated timber extraction - has led to soil erosion becoming a major problem, reducing areas which can be cultivated on the slopes, and leading to siltation in water bodies.

This sub-programme would include actions such as: (i) Promotion of multi-layered perennial crops and afforestation with indigenous species in hilly areas; (ii) land zoning in hilly areas (for establishment of fast growing crops, fruit orchard, native forest species) to arrest soil erosion, (iii) strengthened monitoring and prevention of hill cutting and enforcement of environmental impact assessment regulations; (iv) promotion of improved practices in the shifting cultivation systems.

Implementation: Ministry of Chittagong Hill Tracts Affairs, Forest Department, Department of Environment, Department of Agriculture Extension, Divisional Commissioner's office, Chittagong, Deputy Commissioner's Offices and law and order agencies in all hill districts.

Sub-programme 1.4.3 Managing Coastal Land, preventing and coping with waterlogging and salinity

The coastal area of Bangladesh is the most active part of a delta system where three major river systems (Padma, Jamuna and Meghna) meet the Bay of Bengal. The coastal zone was subject to flooding and storm surges from cyclones; a major infrastructure programme was undertaken from the 1960s to build coastal embankments/polders to protect communities from storm surges and salinity, and effectively reclaim land. One major environmental issue to have emerged in the last twenty years is that an unwanted side effect of the infrastructure and development work in the south has been to create problems with drainage and waterlogging. Parts of the river system are silting up, not helped by the reduced flows due to upstream water extraction in India. The result is that previously productive land is permanently marshy. Reduced flows, particularly in the dry season, also contribute to seasonal problems of salinization due to increased intrusion of tidal salt water. In addition, the popularity of brackish -water shrimp cultivation has led to conflicts over natural resources between shrimp and rice farmers.

This sub-programme would include actions such as: (i) improve drainage through re-excavation and maintenance of rivers, canals, and other enhanced water control infrastructures (GED 2015a); (ii) raise embankments; (iii) Tidal River Management (TRM) schemes¹⁷; (iv) development of mixed farming/aquaculture systems in waterlogged areas; (v) development and promotion of innovative techniques suitable to the coastal region; (vi) implementation and enforcement of (salt water) shrimp culture zone (see national shrimp policy of 2014).

Implementation: Ministry of water resources, Ministry of Fisheries and Livestock, Bangladesh Water Development Board (BRDB), Local Government Engineering Department (LGED), Department of Environment.

6.2 Pillar 2: Environmental Pollution Reduction and Control

Pillar objective

The overall objective of pillar 2 is to reduce pollution to improve ecosystem and human health, and specifically to restore polluted or degraded ecosystems so that they can produce the needed ecosystem services.

¹⁷ TRM can be controversial where competing land use options are involved – such as cropping or aquaculture.

The pillar will contribute to reducing environmental pollution through supporting investments targeting on improving the industrial sector, on sustained solid waste collection and treatment, on better management of hazardous chemicals and enhanced drinking water and sanitary facilities.

The Pillar comprises of three programmes:

2.1. Reduce industrial pollution (including ship-dismantling sector)

2.2. Reduce municipal and household pollution

2.3. Reduce pollution from agriculture and other sources

Programme 2.1: Reduce industrial pollution (including ship-dismantling sector)

The main objective of this programme is to reduce water and air pollution from industrial sources (including the ship-dismantling sector) through adoption of improved technology, sustainable management practices and consistent implementation of regulations.

The top-5 polluting industries in Bangladesh include tannery, pulp & paper, fertilizer production, textile and cement industries (Hoque and Clarke, 2013). However, a large variety of other industrial activities can also contribute to pollution, such as brick making. Industrial activities in Bangladesh are responsible for deteriorating the quality of water, land and air. Rapid and largely unregulated industrial developments can affect aquatic ecosystems, and with them the livelihood systems of local people.

Another serious concern is air pollution (particulate matter, sulphur oxide, volatile organic compounds and other pollutants). The World Health Organization (2014), revealed that Bangladesh has the 4th worst air quality among 91 studied countries. Moreover, Dhaka city belongs to the top-ten list of cities with the worst air quality world-wide. It is estimated that poor air quality in Dhaka costs around 15,000 lives per year.

The marine environment is under pressure from oil spills, littering and the results of ship dismantling activities. Also, offshore drilling and sea bed mining have the potential to place additional pressures on the environment. The pollution involved – including persistent organic pollutants, metals and oil – has a negative effect on marine organisms and biodiversity. This will be given added impetus following the settlement of the maritime boundary dispute with India and Myanmar, which largely adjudicated in favour of the claims of Bangladesh. The government is now adoption an enthusiastic strategy promoting the benefits of the “Blue Economy”.

In order to address these issues, two sub-programmes have been developed to:

<i>2.1.1. Support adoption of cleaner production and end-of-pipe technologies in industrial processes like brick kilns, textile, leather industry, etc.</i>

<i>2.1.2. Prevent, reduce, and mitigate damages to natural ecosystems from oil spills and drilling</i>
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Sub-programme 2.1.1: Support adoption of cleaner production and end-of-pipe technologies in industrial processes like brick kilns, textile, leather industry, etc..

Current levels of inland water pollution **as monitored by the Department of Environment <source>** are at worrying levels; likewise air pollution in Dhaka from factories, and brick making in nearby districts, lead to serious problems of particulate emissions and smog during the winter months. Regulations exist to control emissions and effluent, but the implementation of these appears to be inconsistent.

Under this sub-programme, the main investment priorities may include: (i) Establishment of treatment units for spent toxic, hazardous chemicals and sludge generated in industrial sectors under PPP programme; (ii) Develop industrial parks with centralized treatment plants for the textile sector, preferably by PPP (see the proposal to relocate existing tanneries from Hazaribagh to Savar, building a Tannery Estate in the process, mentioned in the 7TH FYP); (iii) Improve production processes and technologies in the brick kiln sector (involving, small scale entrepreneurs, SMEs as well as big manufacturers); (iv) Develop incentive/benefit packages for encouraging industries to adopt zero discharge policy; (v) Reduction of indoor air pollution in rural areas through innovation/use of improved cooking stoves; (vi) Initiating “pay for pollution” (cost of resources, imposing of tax etc.) scheme, or adopting policy and fiscal measures that discourage polluting and encourage clean technology usage; (vii) Real time online monitoring and/or stack monitoring facilities to monitor pollution by the industries.

Implementation: Ministry of Environment and Forests, Ministry of industries, Ministry of Shipping, Ministry of Science and Technology, Local Government Division (LGD), Ministry of textiles and Jutes, Ministry of Commerce, Department of Environment, City Corporations, Public Private Partnership Authority, SME Foundations, National Board of Revenue (NBR), Bangladesh Small and Cottage Industries Corporation (BSCIC), Deputy Commissioner’s offices and Law and Order Enforcement agencies

Sub-programme 2.1.2: Prevent, reduce, and mitigate damages to natural ecosystems from oil spills, ship breaking and drilling

Despite popular perceptions, the marine resources of the Bay of Bengal are not infinite. Significant damage has been caused in inshore coastal waters from marine activities. An oil spill from a ship near the port of Mongla affected an area of the Sundarbans in December 2014; ship breaking activities in and around the *Karnafuly* estuary at Chittagong inevitably release toxic chemicals to the environment.

Under this sub-programme, interventions are required to reduce emissions of oil and other pollutants to the marine ecosystem via: (i) Development a policy to define authorized zones for ship breaking, recycling, waste management, etc.; (ii) Provision and application of technologies for environmental protection (impermeable surfaces, storage facilities); (iii) Establishment of waste reception facilities at ports to prevent littering of waste into the sea; (iv) Development of an action plan to prevent pollution from off-shore gas/oil drilling (v) Strengthening of capacities of recycling, ship-breaking management, (vi) Strengthening DoE capacity to monitor pollution caused by oil drilling.

Implementation: Ministry of Industries, Ministry of Environment and Forest, Department of Environment.

Program 2.2: Reduce municipal and household pollution

The main objective of this programme is to reduce pollution generated from municipal and household sources. Municipal and household pollution is not only an environmental problem but also an economic one as it affects health and economic productivity. The problems associated with waste should be addressed by activities that lead to preventing and/or minimising waste generation, and improved handling of waste.

This programme is made up of four sub-programmes:

<i>2.2.1. Improve collection, management and treatment of solid waste (e.g. household, medical waste at municipal and cross-municipal level)</i>
<i>2.2.2. Improve supply of safe drinking water to urban and rural communities</i>
<i>2.2.3. Increase collection and treatment of sewage water and drainage water</i>
<i>2.2.4. Improve sanitation at community level</i>

Sub-programme 2.2.1: Improve collection, management and treatment of solid waste (e.g. household, medical waste at municipal and cross-municipal level)

Solid waste includes the garbage that is produced in households, businesses, medical facilities and industries. This waste may contain toxic compounds like heavy metals, or organic compounds, but taking a more positive line, much can be recycled to extract valuable products. The collection and handling of the tons of produced waste per day <estimate> is not sustainably managed and waste pits are usually uncontrolled. In addition, clogging garbage on streets and drains hampers rainwater drainage.

Health risks also arise from poorly managed waste. Infectious diseases can flourish in conditions where waste is dumped into the environment in an uncontrolled fashion. In addition, uncontrolled and poorly managed waste disposal is also causing pollution to rivers, lakes, natural areas and soils – with toxic chemicals which may eventually end-up in the food chain also affecting human health. Another problem associated with solid waste is its burning, even within cities, resulting in severely (local) deteriorated air quality causing serious respiratory concerns for its inhabitants.

This sub-programme will strengthen sustainable collection and handling practices of the different waste flows, through investments to: (i) Develop infectious waste treatment centres (related to medical waste, etc); (ii) Provide training to medical staff on medical waste management in their facilities; (iii) Assess and improve collection systems of household solid waste (including separation of waste at household level); (iv) Establish lead recovery & recycling plants for used batteries via PPP; (v) Design and implement plans on solid waste management in accordance with the 4R policy; (vi) Remove illegal dumping sites in cities; (vii) Judicious selection of land filling sites through undertaking and Environmental Impact Assessment; (viii) Establish facilities for handling electronic waste via PPP; (ix) Develop composting and biogas facilities of organic waste flows via PPP; (x) Set-up a national awareness raising campaign on littering, risks associated with dumping and burning of waste; and (xi) Provide training on enforcement related to collection & disposal of waste flows. (xii) Institutionalization of e-waste management practices with proper monitoring of management activities as well as health and safety of waste handlers. (xiii) awareness raising programme to involve community and relevant stakeholders to work as watchdog to prevent pollution.

Implementation: Local Government Division, Ministry of Health and Family Welfare, Ministry of Industries, Ministry of Social Welfare, Information and Communication

Technology Division Department of Environment, City Corporations, Public Private Partnership Authority.

Sub-programme 2.2.2. Improve supply of safe drinking water to urban and rural communities

The proportion of the population of Bangladesh with access to improved drinking water is around 90% <check and source>. However, drinking water quality is variable, and specific localised problems, such as arsenic contamination, salinity, iron manganese create significant public health risks¹⁸.

Suggested investments under this sub-programme include: (i) Monitor and maintenance of drinking water quality in urban and rural areas (ii) Increasing the supply of the Saidabad water treatment plant (from the Meghna River) (iii) Conduct a study to options of rainwater harvesting in Bangladesh, particularly in cities and municipal areas (might be included in the building code) (iv) Increase piped-water coverage in rural areas of Bangladesh including water treatment plant (v) Enhance availability to other improved water sources in remote areas, particularly in salinity prone areas in Bangladesh. (vi) enhancing grey water treatment and reuse capacities in municipalities. (vii) Develop surface and groundwater quality monitoring system with involving local community people/ school childrens/ or local government industries (LGI). (viii) conduct a study to identify appropriate sustainable safe water options (instead of pipe water) for different geo-physical regions of Bangladesh.

Implementation: Local Government Division, Ministry of Agriculture, Ministry of Water Resources Management, Local Government Engineering Division (LGED), City Corporations, Upazila Nirbhahi Officer's Office, Department of Public Health Engineering (DPHE), Water Supply and Sewerage Authority (WASA), Local government institutions at district, Upazila and Union level, NGOs.

Sub-programme 2.2.3. Increase collection and treatment of sewage and drainage water

There is a need to enhance sewage water collection systems and treatment facilities in both rural and areas. Separate sewer systems for domestic sewage and storm water should be constructed to prevent pollution of water bodies through direct discharge of sewage mixed runoff water. Investment in construction of separate sewer systems will reduce the waterborne diseases, thus, reduce the economic burden. In areas where building sewers have been already been connected to storm water drainage systems, diversion of domestic sewage after separation of household connections from storm water drainage system would prove beneficial in protecting river and surface water bodies.

Investments under this sub-programme should include: (i) Develop sewage water treatment plants in Tongi, Gazipur and Narayangonj (ii) Design and implement sewerage collection systems & treatment systems per district town and paurashavas (iii) Maintain and clean existing sewage systems in Dhaka and Chittagong (iv) Rehabilitation of existing sewers in urban areas (v) Rehabilitation of storm water drainage canals in urban areas (vi) Installing pumping stations for storm water drainage. (vi) Establishment of Fecal Sludge Management (FSM) infrastructure including fecal sludge treatment plant in all city areas and secondary towns/pourashavas served by on- site system (septic tank system and pit latrines).

¹⁸ Bangladesh National Drinking Water Survey (2009); UNICEF and BBS.

Implementation: Ministry of Water Resources, Local Government Division, Ministry of Housing and Public Works, City Corporations, Upazila Nirbhahi Officer's offices, Water Supply and Sewerage Authority (WASA).

Sub-programme 2.2.4. Improve sanitation at community level

The main objective of this programme will be to reduce water-related diseases by improved Water, Sanitary and Hygienic standards. Water, Sanitation and Hygiene are key public health issues in Bangladesh. In total, 60% of the population has to endure unsafe drinking water sources and 40% of the population lack improved sanitation facilities (WASH Alliance, 2015). Poor drinking water quality, insufficient sanitary facilities and the lack of hygienic perceptions cause various water-related diseases like cholera, diarrhea, dysentery, typhoid causing over 100,000 deaths per year (ICDDR,B, 2015). Moreover, drinking water (within particular groundwater sources) are contaminated with arsenic and other heavy metals which may cause severe health risks. The high prevalence of water-related diseases significantly affects the quality of livelihoods and hampers economic growth (GDP) of Bangladesh. Given these effects on human-health and the economy, investments related to Water, Sanitation and Hygiene are required.

Suggested investments under this sub-programme include: (i) Establish public toilets in urbanized areas (ii) Set-up a nation-wide campaign for awareness building on hand-washing and other hygienic perceptions (iii) Conduct studies towards the hygienic perceptions of communities (iv) Develop sanitary facilities via low cost technologies for remote households.

Implementation: City Corporations, Local Government Division, Ministry of Health and Family Welfare, Ministry of Information, Department of Public Health Engineering (DPHE), ICDDR,B.

Program 2.3: Reduce pollution from agriculture and other sources

As many other countries, Bangladesh uses a wide range of chemicals in agriculture and in many industrial production processes. The agriculture sector uses mainly agro-chemicals such as pesticides and fertilizers. Some of the more highly hazardous products have been phased out of production and are no longer commercially available in Bangladesh. However, despite this, traces are still found. In addition, there is also a large (500 MT) stockpile of obsolete DDT at the Central Medical Supplies Division in Chittagong, originally imported for insect vector control during the 1980s. This is now scheduled for disposal in 2016-17, under the Stockholm Convention on Persistent Organic Pollutants (POPs). On the other hand, Bangladesh has already made good progress in reducing emissions of Ozone Depleting Substances under the Montreal Protocol.

This programme is made up of two sub programmes:

<i>2.3.1. Minimize pollution from fertilizers and pesticides</i>
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<i>2.3.2. Support to the Bangladesh National Implementation Plan for Management of Persistent Organic Pollutants (POPs).</i>
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Sub-programme 2.3.1: Minimize pollution from fertilizers and pesticides

Bangladesh pesticide use is estimated at around 30,000 MT <check> of pesticide per year¹⁹. The quantity has reduced significantly as more modern, more specific products are adopted. Levels of mineral fertiliser use in certain districts have the potential to contribute to problems of nitrate run off and eutrophication (although this may be difficult to detect in already-polluted waters).

This sub-programme includes investments on activities to minimise pollution from the use of fertilizers and pesticides, whether in rice production or in high value horticulture crops, specifically: (i) supporting and strengthening Farmer Field Schools on integrated crop management practices; (ii) strengthening capacities of agricultural extension officers in the context of rationalization of agrochemicals use; (iii) enhance fertilizer use efficiency; (iv) Support development of organic farming techniques and organizations; (v) making soil testing facilities more available for farmers by increasing numbers of mobile soil testing van of DAE.

Investments under this particular sub-programme should build upon the Country Investment Plan on Food Security and Nutrition (2011) and its successor, specifically Programme 3 which includes investments on efficient fertilizer use

Implementation: Ministry of Agriculture, Ministry of Industries, Department of Agriculture Extensions (DAE), Bangladesh Agriculture Development Corporation (BADC), Field level offices of the Agriculture department up to union level.

Sub-programme 2.3.2: Support to the Bangladesh National Implementation Plan for Management of Persistent Organic Pollutants (POPs).

Bangladesh prepared a national action plan for management of POPs (date)

This sub-programme is based on investments related to the effective and adequate execution of objectives mentioned under this Bangladesh National Implementation Plan specifically: (i) Develop laboratory facilities of DDT analysis and build capacity for staff on laboratory skills (ii) Awareness raising programme via national workshops, seminars, published materials, Radio/TV programmes and engagement of mass media (iii) Elimination of DDT stockpiles, destruction of DDT including shipping out of the country and training on import officers to prevent illegal trading of DDT (iv) Management and Implementation of PCB Phase out by conducting analysis of PCB contamination and start with clean-up & Transformer Decontamination (v) Identification & Remediation of POPs contaminated Sites (vi) Environmental monitoring of POPs and minimization of U-POPs through technology ; (vii) Up-scale the implementation and monitoring of the National Action Plan for Short-Lived Climate Pollutant (NAP-SLCP).

Implementation: Department of Environment (DoE), Ministry of Science and Technology, Ministry of Commerce, National Board of revenue (all Custom Houses), Ministry of Information, Bangladesh Council for Scientific and Industrial Research (BCSIR).

6.3 Pillar 3: Adaptation, Mitigation and Resilience to Climate Change

Pillar objective

¹⁹ Check with Plan protection wing of DAE

Even with improved natural resource management (pillar 1) and pollution reduction and control (pillar 2), the benefits people derive from ecosystem services can be severely endangered by climate change. Consultations supported the idea of a separate “Climate Change” pillar in the CIP – even if all envisioned investments should be “climate smart.” A separate pillar allows addressing investment needs that are cross-sectoral, that is to say beyond sectoral interventions. It also aligns with existing climate change plans and programmes in the country. In addition, several development partners have specific strategic objectives related to climate change.

Pillar 3 contributes to the CIP investment goal by helping to ensure that ecosystem services necessary for social and economic development are sustainable in the face of mounting climate change threats.

The pillar consists of four inter-related sub-programmes:

- 3.1. *Disaster risk reduction*
- 3.2. *Sustainable infrastructure development*
- 3.3. *Mitigation and low carbon development*
- 3.4. *Increased resilience at community level*

Programme 3.1. Disaster Risk Reduction

Disaster risk reduction is a key theme in the BCCSAP (2009). The main objective of this programme is to promote disaster risk reduction related to climate change, focusing on reducing risks to livelihoods by natural disaster (cyclones, floods, storm surges, etc.). Disaster risk reduction in Bangladesh is a significant economic issue and has many gender implications e.g. early warning systems need to be accessible to women as well as men. According to the Roads Master Plan, the 1998 and 2004 floods caused damage to the road sector worth hundreds of millions of USD <actual estimate?>; thousands of public buildings such as health centres and hospitals were reported to be damaged in these same floods.

Improved DRR can be achieved through better management of land, environment and infrastructure, as well as having improved early warning of possible disaster. All systems, buildings and guidelines will respond to the needs of women as well as men.

This programme consists of three sub-programmes.

<i>3.1.1. Support the development of early warning systems</i>
<i>3.1.2. Strengthening climate change resilient buildings, roads and storage facilities</i>
<i>3.1.3. Risk management against loss on income and property</i>

Sub-programme 3.1.1 Support the development of early warning systems

Early Warning Systems (EWSs) on flood surges, cyclones and storm surges are required to support climate change related decision making and improve resilience of communities²⁰.

²⁰ BWDB has Flood Forecasting and Warning Centre with its river level, rainfall data and satellite images. Today it is not possible to forecast the flood level in Bangladesh more than 3 days ahead and upstream data would be required to further predict flood. Also agro-climatic advisory service is absent.

This sub-programme includes investments in EWS focusing on the following: (i) support institutional strengthening through support of operation and maintenance of early warning systems; (ii) develop **long range** water forecasting system, (iv) Development of a training course for disaster management and development of management rules and a policy on disaster management and (v) awareness raising campaigns in every district to increase resilience of local communities towards natural disasters (e.g. via school programmes), (v) Promotion and awareness raising about existing drought adaptation technologies.

Implementation: Ministry of Disaster Management and Relief, Ministry of Water resources, Ministry of Education, Ministry of Primary and Mass Education, Bangladesh Metrological Department, Deputy Commissioners office, UNO offices, Field level offices of disaster management and education department.

Sub-programme 3.1.2 Strengthening climate change resilient buildings, roads and storage facilities

One element to increase resilience towards natural disasters is to develop and strengthen infrastructure to better withstand natural shocks.

This sub-programme should include interventions to focus on: (i) development, repair and maintenance of cyclone shelters; (ii) strengthening and maintenance of existing buildings (like hospitals and medical centres) and houses in disaster-prone areas to increase resistance against extreme weather events; (iii) raise and repair (connecting) flood-damaged roads aligned with Bangladesh Roads Master Plan (2007); (iv) increase household storage facilities to sustainable store economical goods and basic primary products like water, seeds and other sensitive items via e.g. household silos; and (v) set-up community based storage facilities like silos for storage of food and other primary basic needs.

Regarding investment priorities iv) and v), interventions should be aligned with the Food Security and Nutrition Country Investment Plan program 8, sub-activity 8.3 on “Increase and modernize public storage and handling facilities, including in disaster prone areas” which include investments in warehouses for storage of food (grain).

Implementation: Ministry of Disaster Management and Relief, Ministry of Education, Ministry of Primary and Mass Education, Ministry of Health and family Welfare, Rural Development and Cooperative Division, Ministry of Water resources, Road Transport and Highways Division, Ministry of Food, Local Government Engineering Division.

Sub-programme 3.1.3 Risk management against loss of income and property

Extreme weather events, exacerbated by climate change, will cause damage to households, buildings, enterprises and agricultural activities. To increase resilience of communities towards these extreme weather events and stimulate fast recovery, risk management practices should be established.

Interventions should focus on: (i) develop/adapt models to predict regional weather events in the scope of climate change and (ii) facilitating the development of insurance schemes via public-private-NGO cooperation for losses in property due to climate change impacts (loss of

income, damage to buildings and enterprises) by supporting need assessments and provide technical assistance.

Implementation: Ministry of Disaster Management and Relief, Bangladesh Metrological Department, Bank and Financial Institutions Divisions.

Programme 3.2 Sustainable infrastructure development

[More clear linkages should be made with the Delta Plan here]. Climate change significantly impacts on the environment in Bangladesh. With rising sea levels and changes in rainfall events, the risks of flooding will increase. In addition, the growing population density results in even stronger pressures on water resources. Another concern is the fact that floodplains are inhabited as well and trees are cut which further increases the risks of damage caused by floods. There is therefore a strong call for sustainable maintenance and development of infrastructure. Since water is for everybody, its management should be done by the government in relationship with all its beneficiaries. Under the participatory water management rule (provision of BWDB act 2000), a is also WMO being organized. Depending on location and preference of the Government, various mitigation and adaptation measures can be taken to cope with the effects of climate change on water resources. Since flooding of large parts of land is unacceptable with respect to sustainable livelihoods and economic development protection measures such as embankments, barrages etc. need to be developed and maintained. It is estimated that in 2025, around 3000 km of embankments will require maintenance which will take significant investment. Moreover, drainage capacity of land should be increased. On the other hand, some locations in Bangladesh may become too difficult/costly to protect from effects of climate change in the medium term. Adaptation measures such as changes in land-use, development of flood and saline resistant crops, etc. are required. Another effect of climate change with respect to water resources is the likely increased length of drought periods. This calls for investments in adapted cropping systems, and water use efficiency for farmers to cope during drought periods. Three sub-programs are developed which encompasses the issues mentioned above.

This programme includes three sub-programmes:

<i>3.2.1. Strengthening coastal and inland embankments and improve drainage capacity</i>
<i>3.2.2. Support for operation and maintenance of water management by local stakeholders*</i>
<i>3.2.3. Support the development of irrigation schemes (drought-prone areas) using surface water*</i>

Sub-programme 3.2.1. Strengthening coastal and inland embankments and improve drainage capacity

Interventions under this sub-programme should be built upon and complement the Food Security and Nutrition Country Investment Plan program 2, sub-activity 2 on “Improve & increase efficiency of surface water irrigation, in particular in the South” and sub-activity 3 on “Reduce impact of saline water intrusion in the South and enhance river water flow” as it mentions activities related to flood control mechanisms, on excavation/dredging of canals and rivers/water bodies and on improving drainage conditions.

Since these interventions are mainly focussed on the South of Bangladesh, this sub-programme should complement the Food Security and Nutrition CIP in similar investments in other flood prone areas of Bangladesh. The World Bank is also supporting a Coastal

Embankment Improvement Project (400 million USD). The project is expected to rehabilitate the old embankments to address the impact of climate change in the coastal districts.

Investments are required to support the government and rural communities to (i) developing, strengthening and maintenance of climate proof embankments/dykes including erosion preventing measures, (ii) adoption and maintenance of advanced flood control mechanisms such as dams and sluices, (iii) feasibility study to assess the need for additional climate-related barrages to control and manage the water flows and (iv) excavation and dredging of rivers, canals and other waterways in both rural and urban areas to combat flooding.

Implementation: Ministry of Agriculture, Ministry of Water Resources, Ministry of Food, Ministry of Disaster Management and Relief, Local Government Engineering Department

Sub-programme 3.2.2 Support for operation and maintenance of water management by local stakeholders

It is important to enhance management of coastal areas in southern Bangladesh with respect to effects of climate change like storm surges, cyclones and floods. Investments should include (i) adaptation and implementation of Integrated Water Resources Management (IWRM) by the development of a water allocation plan, development of one hydrological and one environmental prediction model to support decision making and the monitoring of water quantity, (ii) support the preparation, planning and design of other required water management plans such as mentioned in the BCCSAP (iii) strengthen capacities of policies makers on effects of climate change by facilitating training and sensitization on flood levels, salinization and waterlogging and its adaptation measures and (iv) capacity strengthening of farmers for sustainable water management in polders by giving training to extension officers on sustainable water management. (v) assess future water supply operations to the industries, in the face of rapid ground water depletion These investments are complementary to the Food Security and Nutrition CIP in program 2, sub-output 1 on “Improve water resource management in water distribution systems and at farm level”.

Particularly in the southern region there have been changes in land use from crop based to aquaculture based livelihood in response of market. The water management institutions (LGI & WMOs) and associated infrastructure should focus those and address conflicts among various land uses.

Implementation: Ministry of Water Resources, Ministry of Agriculture, Planning Commission (Agriculture, Energy and Water Resources Division), Ministry of Industry, Bangladesh Water Development Board (BWDB), Local Government Engineering Division (LGED), Department of Agriculture Extension (DAE), Barind Multipurpose Development Authority (BMDA).

Sub-programme 3.2.3 Support the development of irrigation schemes (drought-prone areas) using surface water

Another effect of climate change is extreme and increased length of dry periods. In order to address the negative impact of these changes, investments in the development of irrigation schemes (e.g., Flood Control and Drainage, or FCD) should be encouraged. Public-private partnerships should be explored, following a similar approach mentioned under the Agriculture Food Security and Nutrition CIP in program 2, sub-output 1. The government is

encouraging the reduction of dry season boro rice in the drought prone areas, the increasing of boro in favoured areas, and the introduction of water saving techniques. BADC and BMDA already introduced prepaid card for pumped irrigation to limit water use.

Under this Sub-programme, interventions should focus on: (i) Conduct feasibility studies and assessments for water accounting, water productivity gaps and data collection systems (ii) develop a database with satellite data to support monitoring crop water productivity in selected drought-prone areas (to assess affectivity of irrigation by calculating water productivity gaps), (iii) provide equipment for monitoring water flow in main irrigation canals / groundwater wells and develop a database to monitor irrigation water use and (iv) provide technical assistance by trainings on water accounting and monitoring. (iv) carry out alternate wet and dry irrigation and low irrigation system, (v) development of water-efficient crops and cropping systems as well as shifts in cropping patterns in order to make most usage of rain water and less dependency on ground water extraction.

Implementation: Ministry of Water Resources, Ministry of Agriculture, Planning Commission (Agriculture, Energy and Water Resources Division), Ministry of Industry, Department of Agriculture Extension (DAE), Barind Multipurpose Development Authority (BMDA), Bangladesh Water Development Board (BWDB), Local Government Engineering Division (LGED), Public Private Partnership Authority.

Programme 3.3 Mitigation and low carbon development

Bangladesh has signed the Paris Agreement on climate change in December 2015 and committed itself to reduce green-house gas emissions with 5% compared to business as usual by 2030. The Intended Nationally Determined Contributions (INDC) mentions that investments in the power, transport and industry sectors are required to contribute to mitigate global climate change. A conditional 15% reduction in greenhouse gases emission from Business As Usual levels by 2030 should be reached in the form of finance, investments, technology development and transfer and capacity building. In order to reach these targets a package of several mitigation actions should be put in place. Besides the power, transport and industry sectors, suggested investments also include energy conservation at household levels; REDD+, sustainable forest management and enhancement of forest carbon stocks; and reducing agricultural green-house gas emissions. Suggested investments to reduce GHG emissions in the forestry and agricultural sector are included in program 1.1 of this CIP.

The proposed investment areas are in line with the INDC and the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), and are made up of three sub-programmes:

<i>3.3.1. Support climate smart technologies for industry and power generation*</i>

<i>3.3.2. Promotion of low cost transport and low emission vehicles</i>

<i>3.3.3. Promote low emission from agriculture*</i>
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Sub-programme 3.3.1 Support climate smart technologies for industry and power generation

In moving to a low carbon future, there is significant scope for Bangladesh to adopt new clean technologies.

Interventions under this sub-programme relate to technologies and measures in industries, communities and households that contribute to reduction of GHG emissions (air pollution, within particular from industries, is covered separately in early sub-programme 2.1.1 above). Activities under this sub-programme include supporting and promoting: (i) Develop a market system (subsidy scheme) to stimulate market developments in climate friendly products including improved cooking stoves, solar lanterns, small wind mills, etc. – building Bangladesh’s progress in this area, women will be specifically targeted so as to reduce their workload, increase health benefits and stimulate income generation; (ii) conduct a study on techniques to achieve energy and water neutral building in Bangladesh; (iii) provide solar panels to rural households that are disconnected from electricity grids with a total capacity of 14 MW; (iv) review and update existing tax and tariff system to develop incentives for energy saving in the power, cement, steel and dairy sectors; (v) conduct feasibility studies and plan of actions for developing a wind-power park, tidal and wave energy biomass gas plants; (vi) provide support to a study on future energy needs of Bangladesh, including for smallholders, and provide options for least cost energy path; (vii) encourage energy saving operations in the dairy sector of the country (viii) assess possibility and options for introducing carbon tax to the significant emitters; (ix) promote piloting of solar powered groundwater extraction; (x) promote usage of low emitter electronic equipment (e.g., using LED TV instead of CRT TV).

Implementation: Ministry of Environment and Forest, Power Division, Energy and Mineral Resources Division, Planning Commission, Finance Division, ERD, Ministry of Industries, Ministry of Commerce, Ministry of Women and Children Affairs, Ministry of Housing and Public Works, National Board of Revenue, Ministry of Information, Department of Environment, Department of Public Health Engineering, Rural Development and Cooperatives Division, Bangladesh Rural Development Board (BRDB).

Sub-programme 3.3.2 Promotion of low cost public transport models and low emission vehicles

Bangladesh can make significant improvements in the transport sector that will help the country towards achieving its climate change mitigation targets, better environmental quality (reduced air pollution) and economic growth.

Investments under this sub-programme should focus on: (i) develop and implement cleaner fuel & transport standards; (ii) study to a tax and tariff system to discourage use of cars within cities; (iii) develop a first line of an underground metro system in Dhaka city via public-private partnership; (iv) feasibility study to bus transfer system in Dhaka and Chittagong cities to reduce cars in cities; (v) develop additional railways to reduce transport of people and goods over roads.

Implementation: Road Transport and Highway Division, Ministry of Railways, National Board of Revenue (NBR), Department of Environment (DoE), Public Private Partnership Authority.

Sub-programme 3.3.3 Promote low emission from agriculture

Agricultural activities contribute to emissions of GHGs like methane and nitrous oxides (approximately 30% of Bangladesh emissions are due to either anaerobic decomposition in rice paddy, or to enteric fermentation from the livestock sector). Given the intensive

agricultural production in Bangladesh, low emission measures in this sector as part of climate change mitigation will be needed to meet INDCs. <insert FAO references; FAOSTAT>

The Government encourages a balanced use of fertilizer through supporting non urea fertilizers. Experts suggest that future endeavour should focus on increasing nutrient use efficiency through fertilizer deep placement (FDP), vermi-compost, organic manure and conservation agriculture (CA). Enhancing capacity of the extension departments to monitor and surveillance agro-inputs.

Investments from this sub-programme should focus on: (i) provide training to governmental staff on agricultural data collection, analysis and monitoring techniques; (ii) supporting, deploying and adapting low emission measures by awareness raising programs to local communities; (iii) strengthen capacities of extension agents and farmers to adopt low emission practices and monitor use of agro-inputs; (iv) supporting the co-development/enhancement of effective low-emission agricultural techniques; and (v) implementing mechanisms to upscale low emission practices via the development of a finance incentives system by private/public partnerships. <check CSA sourcebook and WB latest publications>

Implementation: Ministry of Agriculture, Department of Agriculture Extension (DAE), Bangladesh Agricultural Development Authority (BADDC), Bangladesh Agricultural Research Institute (BARI), Bangladesh Agricultural Research Council (BARC), Department of Livestock Services (DLS), Statistics and Information Division, Bangladesh Bureau of Statistics (BBS), Local government institutions in the field level, Public Private Partnership Authority.

Programme 3.4. Increased Resilience at Community Level

Improving the resilience of local communities towards climate change will help to rebuild livelihoods faster after a natural disaster like cyclones and floods occur. Investments in this area are required since agricultural and other economic activities should start-up as soon as possible after a natural disaster occurs to sustain livelihoods of millions of people who live in disaster prone regions.

This programme consists of two sub programmes:

<i>3.4.1. Develop community adaptation through community based adaptation (CBA) and ecosystem based adaptation (EBA)*</i>

<i>3.4.2. Scaling-up local innovations on adaptation*</i>

Sub-programme 3.4.1 Develop community adaptation through community based adaptation (CBA) and ecosystem based adaptation (EBA)

Community- and ecosystem based adaptation investments are important to increase resilience of communities towards effects of climate change.

This sub-programme will consist of activities to: (i) support and maintain action research to continuously improve adaptation of communities (including different members within them, such as women/ men, young/ old, marginalized) to floods, drought, cyclones and raising sea level; (ii) support and build capacities of communities and extension officers focussing on

good ecosystem management to prevent ecosystem loss and degradation and enhancing carbon sequestration via conferences, workshops, etc; (iii) support integration of ecosystem based management practices into national and regional strategies and action plans such as the disaster management plan; (iv) develop a gender sensitive mechanism/plan for people's participation in all forest development activities.

Implementation: Department of Agricultural Extension, Forest Department, Department of Environment (DoE), Ministry of Social Welfare, Ministry of Children and Family Welfare, Ministry of Disaster Management and Relief.

Sub-programme 3.4.2 Scaling-up local innovations on adaptation

Local practices – particularly in the agriculture sector – undergo constant processes of innovation and adaptation as new ideas are introduced by extension, the private sector, research or NGOs.

Investments under this sub-programme should focus on (i) support and build capacities on political leadership, vision and sustained commitment through political cycles to create an environment for innovation at national and local levels; (ii) strengthen national-local linkages both vertically and horizontally; (iii) support study on economic and climate change related effects of local innovations and possible contributions to national strategies and action plans; (iv) provision of financial resources (micro-credit system) for individuals to develop new ideas, with specific targeting of women/ the vulnerable/ marginalized for innovation development; and (v) create a platform for people to share ideas and (vi) review and update existing institutional arrangements for patents.

Implementation: Cabinet Division, Local Government Division (LGD), Planning Commission, Ministry of Industry (Department of Patent Design and Trademark), Bank and Financial Institutions Divisions, Department of Agricultural Extension.

6.4 Pillar 4: Environmental Governance, Gender & Human and Institutional Capacity Development

Pillar objective

In the chapter dedicated to the environment and climate change sector, the 7th Five Year Plan names a number of issues that relate to the need to improve environmental governance. In particular, it highlights that *“Policies to combat pollution are largely ineffective because of loose regulatory practices. Governance elements such as information access, transparency, accountable decision-making, management tools all need improvement. The GoB realizes that environmental policies need to instil market-based incentives to firms to encourage good environmental performance. Access to information and knowledge about risks could greatly reduce the harmful impacts of environmental factors.”*

This pillar aims to improve environmental governance through improvements in the legal and regulatory frameworks, updating them where necessary and making greater use of market-based instruments and incentives. It also aims at strengthening the GOB capacity to implement and enforce such frameworks through better tools and technologies, information management, collaboration with multiple stakeholders, and monitoring.

In Bangladesh responsibilities for the management of the EFCC lie within the mandates of a large number of ministries, divisions/departments and organisations. Effective environmental management requires a concerted effort as the performance of one Ministry also depends on what other Ministries and agencies do. This pillar aims to improve environmental governance through strengthening of mechanisms for coordination and collaboration.

This pillar also aims to enhance gender equity and knowledge management to ensure that natural resources, environmental and climate change measures enhance ecosystems services. Institutional capacities will also be strengthened to improve education, research, and extension services. The latter are important to ensure greater effectiveness, improved coordination and management, better coordination in service delivery, and reduction in duplication of efforts. Cross cutting issues like gender and ethnic minorities with a bearing on governance and stewardship are also included in this pillar.

The pillar consists of three inter-related programmes:

4.1. Improving the legislative, regulatory and policy framework for the EFCC;

4.2. Ensuring stakeholder participation and mainstreaming gender equity in EFCC Sectors

4.3 Improved transparency, organizational processes and knowledge for evidence based decision making

Programme 4.1. Improving the legislative, regulatory and policy framework for the EFCC sectors

In Bangladesh, there are around 200 laws that have bearing on EFCC. These laws provide for measures relevant for environment and forest conservation, offer protection against various environmental offences and by prescribing or prohibiting certain activities, lay down rights and duties. Much of this environmental legislation has been in place for decades although it is not widely enforced. Moreover, lack of awareness amongst the implementers and the general public as to the very existence and scope of these laws makes them functionally ineffective.

More recently, measures have been taken to strengthen the judiciary system for dealing with the environmental and forestry related issues: These include the adoption of the Environment Court Act (ECA), 2000 (amended in 2010) which is a milestone in the journey of environmental protection/ conservation in Bangladesh. But the Act fails to ensure speedy and effective environmental protection due to some latent defects. Releasing the environmental court from the workloads of civil suits and criminal cases, entrusting it with the sole function of trying environmental cause, empowering it with suo moto and judicial review power, extending its scope of application and jurisdiction, and removing all loopholes can make the court competent for the coherent dispensation of environmental justice in Bangladesh.

Apart from the adjudication issue, other problems are there, notably difficulties in the management of land and other natural resources. Environmental issues are closely connected to the land management practices of the country. The Offices of the Deputy Commissioners administer revenue collections, and approve settlement of government owned land (commonly known as the *khas* lands), make changes in land classification and acquisition of land for development. Although the Department of Fisheries has responsibility over fish and the Forest Department over forest resources, the Ministry of Land and Deputy

Commissioners control much of the water bodies, forests and land, which they lease in order to collect revenue. The revenue collected is small in the national budget, but the system creates significant perverse incentives, **corruption**, and difficulties and disputes in the management of natural resources.

As far as pollution is concerned, responsibility for its control and abatement (air, water and soil) is with the DoE. DoE has the mandate to set standards, defining EIA and its procedure, issuing clearance certificate for all forms of pollution as well as declaring and protecting degraded ecosystems. There are overlapping mandates in this area as well. Especially in the case of water management related policy-planning and regulation, the Ministry of Water Resources and its departments (Water Resources Planning Organization (WARPO) and Bangladesh Water Development Board (BWDB)) hold the primary responsibilities. The BWDB is principally responsible for implementation, operation and maintenance of water related projects, whilst WARPO is mandated to provide advice on policy, planning and regulation of water resources beyond the Ministry of Water Resources. Under the provision of Water Policy (1999) implementation of all major surface water development projects and other FCDI projects with command area above 1000 ha falls under BWDB while area under 1000 ha falls under LGED. BADC is also responsible for water sector development in creating minor irrigation facilities using both surface and groundwater. BMDA in Barind supplies buried pipe irrigation. [**This may fits better under 4.1.2**]

Regarding policy framework, Bangladesh has been able to create an enabling policy regime for better management of its environment and natural resources including forests. The policies have adopted in principle the concept of sustainable development and recognized the importance of environmental pollution control and ecological balance in economic development strategies. Nevertheless, national polices although fairly rich in content, are not supported by necessary actions of implementation. Although Bangladesh's Gender Action Plan for the BCCSAP by MoEF has been cited as a global example of good practice, uptake in Bangladesh is modest. However, gender dimensions and priorities need to be more systematically mainstreamed into sector policies e.g. forestry, environment. Investments may be designed to target the poor marginalised and vulnerable households who depend heavily on natural resources. The vulnerability to climate change is different for women as their access and control over resources and decision making is lower than those of men. Hence, the CIP includes gender as a programme and emphasises the mainstreaming of gender within the other programmes.

This programme is designed for providing support to the government in building a cohesive and congenial legislative and policy environment appropriate for conservation and protection of natural resources (protected areas, ecologically critical areas, wetland sites) with a view to bringing the country closer to the national and international targets.

Considering the existing legislative and policy environment of the country this programme undertakes the following four sub programmes:

<i>4.1.1. Strengthening the regulatory framework for EFCC (including pollution prevention & control)*</i>
<i>4.1.2. Improving Enforcement and Application of Regulatory Frameworks*</i>
<i>4.1.3. Support to rational arbitration among users of ecosystems services</i>

Sub-programme 4.1.1. Strengthening the regulatory framework for EFCC

[Some text could be added on the issue of land tenure, licensing. Currently what is mentioned is the digitization and archiving of land records, as mentioned in the 7FYP.]

This sub-programme will focus on streamlining EFCC related laws and bylaws and harmonizing them with relevant international conventions and treaties as well as capacity strengthening of line ministries and departments, lawmakers and law enforcers.

Suggested interventions are: (i) Develop and implement instruments that can provide economic incentives for better environmental management. Examples may include: licensing and fee collection system for (ground) water use by industrial production processes; economic incentive system to reduce industrial pollution via e.g. "polluter pays principle"; publicly "shaming" worst polluters by publicizing environmental performance information; "green labelling" for environmental friendly products and production processes; enforcement action plan on phasing out traditional brick kiln factories, (ii) Review EFCC related laws and update/harmonize them with relevant international convention and treaties; (iii) Set up capacity building programmes to enhance legislators' capacity to effectively deal with EFCC issues; (iv) Develop regulatory *frameworks, action plans and systems* for example on, ground water monitoring and charging to help enforce the Bangladesh Water Act; (v) Develop a monitoring and information system of industrial activities to identify and better manage polluting industries; (vi) Establish biodiversity cell, chemical management cell and 3R cell in DoE [double check that they have not been established already]; (vii) Pilot the promotion of ISO 14000 environmental management principles in selected industrial companies.

Implementation: Ministry of Environment and Forest, Legislative and Parliamentary Affairs Division, Parliament Secretariat, Ministry of Water Resources, Department of Environment, Ministry of Industry, NBR, Ministry of Shipping, Ministry of Disaster Management and Relief, BSTI.

Sub-programme 4.1.2. Improving Enforcement and Application of Regulatory Framework

While regulations exist to manage resources and control pollution, implementation of these regulations is lacking. There is a considerable need to strengthen the capacity of the relevant institutions at national and local (upazilla) level, supported by sufficient legal powers. Inconsistent and unequal enforcement/ application of regulatory frameworks was a persistent concern during all consultations held during the period June-November 2015. Inconsistent application of the rule of law acts as a disincentive for law compliance and promotes distrust in the state. Ineffective coordination between line Ministries/Departments was also mentioned as an issue.

Since many environmental issues of the country are partly due to non-enforcement of existing laws, the legal system would need to be strengthened along with its fair application. Institutional capacity for implementing the various action measures identified by the EFCC related legislations and policies are still inadequate. Coordination between line ministries/departments is limited. Most of the concerned ministries and departments including the MOEFs lack institutional capacities in terms of human resources, technological

and financial resources, needed for proper implementation of the exiting legal provisions and policies. It lacks essential baseline data on resources and areas of environmental concern.

This sub-programme will focus on strengthening enforcement and application of existing laws, bylaws and implementation of sectoral policies, especially by investing in an environmental justice system. A study will be commissioned to determine the main issues in enforcement and make proposal for further improvement including staffing and capacity development, and investment proposals developed accordingly. Gender dimensions will be considered e.g. whether/ how women and men are differently able to make use of an environmental justice system.

Under this sub-programme, support will also be provided for institutional capacity strengthening for industrial and marine-related pollution management and control. These include:

(i) Identify main concerns related to the enforcement of EFCC sector laws, rules and regulations and make proposal for further improvement of environmental justice system including staffing and capacity development; (ii) Pilot community-based pollution control enforcement at 7 demonstration sites (one in each division); (iii) Initiate measures to strengthen application of EIA (e.g., engage independent panel of experts to review EIA for large projects) (iv) support measures to enhance enforcement, monitoring and surveillance capacity of forest department and DoE; (v) Establish criteria for assessing loss and damage by effluent discharge and air pollution; (vi) support the implementation of the vehicular emission enforcement programme; (vii) support to organization of public hearings on EFCC issues.

Implementation: Ministry of Environment and Forest, Department of Environment, Law and Justice Division, Environmental Courts, Forest Department, Law Enforcing Agencies

4.1.3. Support to rational arbitration among users of ecosystems services

Public, at large, is the beneficiary of natural resources and ecosystem services including seashore, watercourses, air, forests, and ecologically fragile lands, and the state is under legal obligation to protect the natural resources meant for public use and enjoyment as well as for ensuring fairness in terms of access. As it is difficult to regulate the property rights over the ecosystem services, conflicts may arise between parties over the distribution of benefits. Nevertheless, environmental disputes are different from other individual and social disputes. Its impact goes beyond the disputant parties, often creating concerns for restoration of ecosystem and human existence. Decision being made and the policies enforced can have far reaching impact beyond the interest of the parties involved. Therefore, regulating relationships among the users of ecosystem services being it individual or groups is another area that demands attention for the sake of environmental governance.

This sub-programme may include following activities:

(i) Establish integrated framework to protect common property resources (ponds, beels, etc.) in rural areas and ensure access of poor communities to these resources; (ii) Formulate a long term strategy for rationalize supply of water to new development areas and consumers; (iii) Develop an action plan for completing the land zoning and land use plan for the entire

country; and (iv) Review environmental court's performance with regard to arbitration among users of ecosystem services.

Implementation: Local Government Division, Rural Development and Cooperative Divisions, Ministry of Water Resources, Ministry of Land, Law and Justice Division, Environmental Courts, Department of Public Health Engineering, Water Supply and Sewerage Authority (WASA), Village Courts.

Sub-programme 4.1.4. Improving formulation, coordination and implementation of EFCC related policies

Despite having many top-level coordination councils for dealing with environmental policies there exists 'log-jam' in environmental decision making and there is no effective 'go to' problem solving body.

Inter-sectoral coordination in dealing with cross-cutting issues like environment and climate change is a major issue in Bangladesh, as in many countries, and the natural resource sectors suffer particularly in this regard. Policies are thus often criticized for their lack of direction, cooperation, coherence and coordination among interested parties/stakeholders. The management responsibilities of different EFCC components are spread across different sectors and ministries; whilst it is positive that these issues are integrated into all sectoral policy and organizations, it makes the smooth implementation of sustainable management a challenge.

This sub-programme emphasizes rendering environment related policy bodies functional and promoting effective stakeholder collaboration with a view to improving EFCC policy formulation, coherence, coordination, implementation, with a focus on public agencies. Activities will relate to (i) the organization of knowledge sharing events on issues related to the organizational development of EFCC relevant institutions (ii) analytical studies at national/sub-national level that identify strengths and weaknesses of EFCC relevant institutions and provide necessary technical support for enhanced capacity building and institutional adaptation; (iii) systematic analysis of critical EFCC issues (e.g., EFCC policy development/conflict management in participatory forestry, EFCC financing) (iv); development of tools, guidelines, and methodologies or approaches on selected management issues (e.g. inter-sectoral collaboration, and improved stakeholder participation, indicators for effective governance).

Implementation: To be added.

Program 4.2. Ensuring stakeholder participation and gender equity in EFCC Sectors

Stakeholder participation (including women) helps to identify problems, understand different perspectives, customize activities, increase ownership, build the level of support and ensure sustainable implementation. Therefore, this programme encourages gender equity, and wider participation in ecosystem governance to ensure that all sections of the population can access ecosystem service benefits, and be well-informed to ensure sustainable natural resource management.

This programme is made up of three sub programmes:

<i>4.2.1. Development and Strengthening of mechanisms for stakeholder participation in EFCC policy development and implementation*</i>
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<i>4.2.2. Gender equity, empowerment and inclusiveness of minorities in EFCC sectors*</i>

<i>4.2.3. Support to producers organization, rural communities, groups, etc.*</i>

Sub-programme 4.2.1: Development and Strengthening of mechanisms for stakeholder participation in EFCC policy development and implementation

This sub-programme aims at supporting government agencies, national/local NGOs, women's and other associations, development partners and private sector to increase their impact on ecosystem development.

This will be achieved through (i) supporting existing networks and platforms in the EFCC sector for conducting studies and implement policy advocacy works; (ii) arranging training on facilitation skill, participation plan, negotiation, and communication strategy; (iii) facilitating dialogue to help reflect stakeholder's view in the design of future CIP projects, policies, programme preparation and implementation process; (iv) developing process to help public participation in different environmental hot spot areas; (v) improving MoEF/ DoE's websites for presenting information; (vi) developing partnership with NGOs/CBOs to create wider awareness on environmental issues.

Implementation: Ministry of Women and Children Affairs, Ministry of Information, Ministry of Social Welfare, Department of Environment (DoE), Local government institutions and filed levels, UNO offices.

Sub-programme: 4.2.2: Gender equity, empowerment and inclusiveness of minorities in EFCC sectors

The aim of this sub-programme is to stimulate gender equity and increase the inclusion of marginalised groups in environmental management. The focus of this sub-programme is increasing capacities, participation and influence of women and the marginalised in environmental decision making.

This will be done by: (i) strengthening capacities of rural women including in women's organizations/ mixed sex rural organizations to better engage in environmental management activities through awareness raising on their rights in an EFCC context, training in leadership, lobbying and negotiation; (ii) promoting participation of women at all levels, as well as the marginalised, in decision making processes for EFCC related issues; (iii) supporting capacities in gender sensitive policy and programming in MoEF and its agencies including promoting women's advancement in these agencies. This sub-programme complements the focus on gender in selected programmes and gender as a design principle – see Annex 3 for 'EFCC gender action plan', which presents these dimensions together.

Implementation: Ministry of Women and Children Affairs, Ministry of Social Welfare, Department of Environment (DoE), Ministry of Chittagong Hill Tracts, Local government institutions and filed levels, Rural Development and Cooperative Division.

Sub-programme 4.2.3. Supporting CSOs, NGOs, producers' organizations, rural communities and groups

Stakeholder participation is an enshrined principle of good governance. At the same time, stakeholder participation contributes to better governance not only to the extent that suitable mechanisms exist to share their voice and concern but also to the degree that they are capable and prepared to contribute to policy dialogues. CSOs, NGOs, local producers, forest organizations and rural communities need to be strengthened in their capacities for better management of the environment.

Planned actions under this sub-programme include: (i) Assess specific need of the EFCC related rural organizations; (ii) Provide support for establishing and strengthening EFCC related grassroots groups, communities, CBOs; (iii) Arrange training on advocacy, negotiation techniques, business development, and other related issues; and (iv) set up financial schemes e.g. micro credit for producers' organization, rural communities, forest groups etc.

Implementation: Ministry of Social Welfare, Rural Development and Cooperative Division, Bangladesh Rural Development Board (BRDB), Bank and Financial Institutions, Bangladesh Bank, Bangladesh Small and Cottage Industries Corporation (BSCIC), NGOs.

Programme 4.3: Improved transparency, organizational processes and knowledge for evidence based decision making

The MoEF and its agencies have limited established mechanisms in place for systematic monitoring, analysis and exchange of environmental information and regular documentation. Basic data is missing or not readily available to make informed decisions and learn from the past. Mapping, databases, inventories are still needed on topics ranging from different ecosystems and species to industries and pollutants.

The objective of this programme is to develop and institutionalize a comprehensive data base and information management system, and to enhance knowledge and operational capacities of the human resources within the relevant organizations. It is envisioned that this will help stakeholders to make informed decision which in turn will contribute to the conservation and development of the ecosystem services

This programme is made up of four sub-programmes:

<i>4.3.1. Support to information management systems for data collection, use and dissemination for improved budget planning, implementation, monitoring and evaluation*</i>
<i>4.3.2. Support to implementation of the EFCC Research Master Plan and Training Plan*</i>
<i>4.3.3. Establishment of a centre for knowledge management and training on environment, forestry and climate change*</i>
<i>4.3.4. Support to Knowledge Systems, including Research Organizations, Extension and Education, NGOs in EFCC*</i>

Sub-programme 4.3.1. Support to information management systems for data collection, use and dissemination for improved budget planning, implementation, monitoring and evaluation

Information plays a vital role in public awareness of environmental problems, and in governmental interventions. Therefore, proper environmental information management is essential for planning, monitoring, learning and resource mobilization. This sub-programme is designed to help build a coherent and comprehensive information management and monitoring arrangement suitable for inter-agency collaboration and cooperation, and assessing impact of investment in EFCC sector.

This subprogram will include the following activities: (i) set up air quality monitoring system in major cities; (ii) Develop comprehensive database for all textile developing firms; (iii) Establish National Drought Monitoring system; (iv) Develop baseline data on key environment and forest indicators utilizing BBS for future interventions; (v) Develop/ Strengthen EIA system as environment management tool; and (vi) Strengthen ambient environment monitoring network. Sex disaggregated data and GoB gender budgeting approaches will be integrated into all systems.

Implementation: Ministry Environment and Forest, Department of Environment (DoE), Forest Department, Ministry of Textiles and Jutes, Ministry of Commerce, Bangladesh Metrology Department, Disaster Management Bureau (DMB), Bangladesh Bureau of Statistics (BBS), Finance Division.

Sub-programme 4.3.2. Support to development and implementation of the EFCC Research Master Plan and Training Plan

Under this sub-programme support will be provided to the development and implementation of the Research Master Plan to reinforce/ restructure current research infrastructure in BFRI as well as in different Departments/ Universities/ NGOs. It is expected that private sector entities and banks may be interested in supporting investments in innovative technologies in the EFCC sectors that, while contributing to economic growth will provide significant environmental co-benefits. Additionally, under this sub-programme the training programme of the MoEF will be supported and scaled up.

The subprogram will include the following activities: (i) support research (e.g. by Universities, NGO,s) on new technologies, like, bio-remediation, innovative and eco-friendly strategy, research on medicinal plants for traditional health care, multi layered fruit garden, restoration of degraded ecosystems; (ii) support research/ studies for assessing impact of climate change on major sectors such as agriculture, industry, poverty and people living in vulnerable areas, out-migration, tourism, health, transport and financial services; (iii) support and scale up EFCC related training programmes, (iv) Translate research outcomes into appropriate policy recommendations (v) Commission research by universities and NGOs (vii) Campaign for mobilizing support from the private sector/banks in terms of financing for research and innovation (CSR); (vi) Conduct periodic updates of training need (TNA) and impact assessment.

Implementation: DoE, Forest Department, BFRI, Ministry of Science and Technology, Bangladesh Bank, Relevant departments/institutes of public and private universities, Planning Commission, NGOs.

Sub-programme 4.3.3. Establishment of a centre for knowledge management and training on environment, forestry and climate change

In Bangladesh significant knowledge/information on climate change has been gathered or generated by a wide range of organizations including the government, research and academic institutions, civil society organizations (CSOs), NGOs and private sectors. Yet, most of them lack a standardized method of organizing, refining, sharing and disseminating their knowledge capital. This limits widespread access to and use of this knowledge base. It is therefore necessary to have a common centralized institutional framework for ensuring formal integration and optimal sharing of climate change information and knowledge across the government, private sector, CSOs, research institutions and individual researchers. This sub-programme aims at supporting the establishment (or upgrading of an existing one) of a centralized knowledge management centre meant for knowledge management and training on climate change and other environmental and forestry issues.

Implementation: Ministry of Environment and Forest, Ministry of Public Administration (MoPA), Planning Division, CBOs, NGOs, individual researchers.

Sub-programme 4.3.4. Support to Knowledge Systems, including Research Organizations, Extension and Education, NGOs in EFCC

Research and extension is the basis for the transformation of functional EFCC sectors but is largely underfinanced in Bangladesh. The priority of the Government is to enhance the capacity of research institutes and so that they can provide innovative solutions to the challenge of climate change. In particular, the focus is to develop human and technical capacities and improve national and international cooperation of Agencies involved. (Bangladesh Forestry Research Institute, Institute of Environmental Science (IES) Centre for Climate Change and Environmental Research, International Centre for Climate Change & Development (ICCCAD), agro-forestry programs of BARI, and other universities.

Investments may include (i) support the rehabilitation and re-equipment of relevant training centres; (ii) Establish a competitive research grant fund financed by the government, development partners, and the private sector; (iii) Arrange training and other capacity building programme for research staff (e.g. climate change), extension workers, nursery managers and high and mid-level government officers (including those from the Agencies such as the National Herbarium) (iv) support the investment in research facilities, vehicles and equipment; (v) Form and maintain international and regional research partnerships; (vi) support to create an effective and functional extension system responsive to stakeholders' need and global changes and development; (vii) Arrange diploma level training for new extension workers; (viii) Support partnership development among regulatory institutions for strengthening the environmental watch programme to monitor the nation-wide environmental quality (publication of newsletters, organizing debates, competitions, seminars, publishing environmental outlooks, conduct behavioural change campaigns etc.).

Implementation: BRRI, Institute of Environmental Science (IES), ICCAD, Finance Division, DAE, NGOs, Public and Private Research Organizations.

Chapter 7. Results Framework

The results framework defines what the country wants to achieve through the CIP in terms of improved development and management of the environment, forestry and climate change. It is an essential component of the plan as it enables monitoring not only of investment flows but also of the impacts of such investments²¹.

The CIP results framework is made up of a three-level results chain that links the contributions of sub-programs (outputs) to program level outcomes and pillar level impacts. The identified results are consistent with key national strategic documents, the GoB own targets (as defined in each Ministry annual performance agreements or APAs), the recently approved Sustainable Development Goals (SDGs) and other commitments made by the GoB towards international conventions such the NDC submitted to the UNFCCC. Indicators should be relevant (measure progress on the specific program/sub-program); available at least on an annual basis; measurable with a relatively sound methodology; coming from credible sources; SMART and, whenever possible, disaggregated by age, sex, rural/urban areas. The proposed CIP and pillar level indicators are in the following table. Annex [X] contains the full set of indicators for the program and sub-program level.

The first cycle of monitoring will refine the type and sources of indicators for baselines, targets, and for monitoring CIP implementation.

²¹ A focus on results has grown significantly since the mid-1990s, with the endorsement of the Millennium Development Goals. More recently, at the Rio+20 Summit in June 2012 member states agreed to create a set of universal and integrated Sustainable Development Goals (SDGs) which have been adopted by the UN in 2015.

CIP DRAFT RESULTS FRAMEWORK

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EFCC-CIP OVERALL GOAL						
		No	Indicators (proxies)	Baseline	End Target (by 2021)	Information Sources
Sustainable management of environmental and natural resources and climate change mitigation contribute to sustainable development		a	Environmental Performance Index (EPI)	41.77	By end of 2021 the Environment Performance has improved	http://epi.yale.edu (Yale University data on Bangladesh)
		b	Gross Domestic Product (GDP) loss due to natural disasters (SDG 1.5.2)	0.86% (annual 1995-2014 average)	GDP losses decrease by xx % by 2021) Project identified	GoB, http://germanwatch.org/fr/download/13503.pdf
		c	Number of deaths, missing persons due to natural disasters (SDG 13.1.2; SDG 1.5.1)	725 (annual 1995-2014 average)	Reduction in number of deaths, missing persons (project identified)	GoB, Germanwatch Report and SDG
		d	Total GHG emissions (MtCO2e)	Total: 190 (2012): Energy: 62 Industry: 3 Agriculture: 75 Waste: 18 LUCF: 31 Bunker fuels: 1	5%/15% below BAU by 2030 (unconditional/conditional)	GoB (INDC) FAO: http://faostat3.fao.org/browse/G1*/E ; (up to 2012); UNFCCC National communications; http://cait.wri.org/profile/Bangladesh
		e	Financial resources from Government and Development Partners (DPs) spent on investments in the EFCC sectors (SDG 13.a.1)	5.5 bn USD (to be revised with updated mapping)	More financial resources to be allocated to the EFCC sectors though GoB, DPs by the end of the CIP period (2021)	GoB (ADP and IMED, BCCT, DPs)
		EFCC-CIP EXPECTED OUTCOME/IMPACT				
Components	Expected Outcome/Impact Statements	No	Indicators (proxies)	Baseline	End Target (by 2020)	Information Sources
1. Sustainable Development and	Natural resources are sustainably	1.1	Area under forest coverage (SDG 15.1.1)	13.2%	Forest coverage is increased to 15% of total land by 2021 (7FYP has target of 20%)	MoEF

Management of Natural Resources	<i>managed</i>	1.2	Area extended as new protected areas [APA 1.9.1] OR Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type (SDG 15.1.2, Aichi Biodiversity target 11)	578 Hectares (in 2013-2014) 6.8% (terrestrial and inland water); 6% (coastal and marine)	3000 Hectares protected per year till 2021 17% (terrestrial and inland water); 10% (coastal and marine) by 2020; NBSAP sets 5% and 10% improvement targets over baseline by 2021	MoEF
2. Environmental Pollution Reduction and Control	<i>Environmental pollution growth is slowed down and maintained at lower rates</i>	2.1	Decreased probability of dying between the age of 30 and 70 from any of cardiovascular disease, cancer, diabetes, chronic respiratory disease (NCDs)	18% (2012)	16% (2020) based on extrapolation of current trend	SDG, measured by WHO http://www.who.int/nmh/counties/bgd_en.pdf
		2.2	Air Quality Index (AQI) for Dhaka City and other urbanized areas OR SDG 11.6.2: Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	TBD	150 in Dhaka / 100 other areas (maximum values; lower is better) Project identified indicator	SDG, measured by WHO http://www.who.int/nmh/counties/bgd_en.pdf
		2.3	National Water Security Index (household water security, economic water security, urban water security, environmental water security, resilience to water-related disasters)	1.4 (2013)	2.0 (2020) Project identified indicator	Asian Development Bank, http://adb.org/sites/default/files/pub/2013/asian-water-development-outlook-2013.pdf

3. Adaptation, Mitigation and Resilience to Climate Change	Climate change adaptation and mitigation measures are implemented and resilience increased	3.1	Total GHG emissions (MtCO ₂ e) SDG 9.4.1: CO ₂ emission per unit of value added	Total: 190 (2012): Energy: 62 Industry: 3 Agriculture: 75 Waste: 18 LUCF: 31 Bunker fuels: 1	5%/15% below BAU by 2030 (unconditional/conditional)	GoB (INDC) FAO: http://faostat3.fao.org/browse/G1/*E ; http://faostat3.fao.org/download/G1/GT/E (up to 2012); UNFCCC National communications; http://cait.wri.org/profile/Bangladesh
		3.2	Preparedness to reduce risks of natural disasters	0.275 (2014)	Index to increase 0.35 in 2021	Notre Dame ND-GAIN Country Index: http://Index.gain.org/country/Bangladesh
4. Environmental Governance, Gender and Human and Institutional Capacity Development	Human and institutional capacity are improved to enhance stewardship in the EFCC Sectors	4.1	Domestic revenues allocated to sustainable development of EFCC sectors	? Percentage (% of GDP per sector	?	
		4.2	Increased availability laws and legislation	100 Nos	5% increase (project identified)	
		4.3	Number of persons in EFCC sector related GoB trained	100 Nos	5% increase (project identified)	
		4.4	Capacity of Judiciary system developed (number trained)		400 (WB project)	
		4.5	Government effectiveness (percentile rank = % of countries that ranks lower)	21.6 (2014)	Improved	World Bank: http://info.worldbank.org/governance/wgi/index.aspx#countryReports

Chapter 8. Cost and Financing

The CIP may be considered a strategic communication tool addressed to government policy makers and development partners. Beside having a strong monitoring function, it can assist in attracting (additional) investments and leveraging funding. It provides information on priority areas for interventions and financing gaps and can be used strategically to inform policy changes and investments decisions. The costing of the CIP was a key stage in the CIP preparation process and should be considered as a “strategic-level” costing to differentiate it from project-level costing that takes place during the preparation of projects and programmes (FAO, 2015).

It is important to mention that the CIP includes only public investments i.e. investment channelled through the GoB as well as most of the investments from development partners (DP). The DPs were asked to provide information on their on-going and planned activities. Investments from development partners through NGOs and CSOs were not included in the CIP costing exercise at this stage. Also investments made through private sector channels in the EFCC sectors have not been taken into consideration as no reliable information is readily or systematically available²². It was also decided not to include recurrent cost (e.g. government salaries) price support, subsidies and other interventions covered by the revenue budget.

8.1 Method

The costs of the CIP were estimated by determining the CIP activities needed to reach established targets.

The prioritized activities are described in Chapter 6. Following an output based budgeting methodology (FAO, 2015), the budget for each intervention has been calculated by multiplying an intervention’s target by its unit cost to give a total result for each intervention, and by aggregation, for each programme and pillar. The identification of the base/unit costs have been derived based on strategic investments in the EFCC sectors in Bangladesh with specific targets set for each intervention which will be used as the monitoring indicators. Existing projects have been analysed and evaluated to determine the estimated unit costs (i.e. World Bank, Asian Development Bank, USAID, JICA, GIZ, CIDA, DFID etc.).

Following this simple methodology, the estimated amount needed to meet the established targets by 2021 is about USD 10 billion (see next Table). Further analysis will be carried out to refine this methodology.

*While costing should be accurate, it should be noted that the CIP provides estimate costing towards a realistic **order of magnitude**. Costing will then need to be further detailed and actualised when formulating projects and programmes (FAO, 2015). Additionally, it has been at times proven difficult to allocate existing projects funding to a specific CIP sub-programme/programme in a detailed manner. This is because project designs and their logframes include objectives that relate to different programs of the CIP.*

²² The CIP on agriculture, food security and nutrition similarly excluded investments from NGOs/CSOs and private sector.

An additional exercise consisted in estimating the amount of existing financing already available to advance the objectives of the CIP. Summary figures are shown in the next Table. About 130 projects were identified in the ADP 2015-2016 which are contributing to the CIP. The total value of these projects is about USD 7.3 billion. However, many of these open projects have been operational for some time. Deducting the amounts already spent, the remaining amount for the period 2016 – 2021 was estimated at about USD 4.7 billion. An additional USD 700 million are being financed by DPs while about USD 80 million is estimated to come from the BCCT. PRELIMINARY ESTIMATES.

<i>Bangladesh EFCC Country Investment Plan (CIP 2016-2021, ,000)</i>		<i>CIP</i>	<i>Existing</i>	<i>Gap</i>	<i>%</i>
Pillar 1: Sustainable Development and Management of Natural Resources					
<i>P 1.1.</i>	<i>Sustainable management of and socio-economic benefits from forests enhanced</i>	\$422,600,000	\$35,000,000	\$387,600,000	92%
<i>P 1.2.</i>	<i>Biodiversity conservation*</i>	\$487,000,000	\$36,000,000	\$451,000,000	93%
<i>P 1.3.</i>	<i>Sustainable management of wetlands</i>	\$365,500,000	\$267,000,000	\$98,500,000	27%
<i>P 1.4.</i>	<i>Other Sustainable Land and Water Management</i>	\$82,000,000	\$16,000,000	\$66,000,000	80%
	Total per Pillar	\$1,357,100,000	\$354,000,000	\$1,003,100,000	74%
Pillar 2: Environmental Pollution Reduction and Control					
<i>P 2.1.</i>	<i>Reduced industrial pollution (including shipwreck dismantling)</i>	\$599,000,000	\$93,000,000	\$506,000,000	84%
<i>P 2.2.</i>	<i>Reduced municipal and household pollution</i>	\$2,867,000,000	\$1,903,000,000	\$964,000,000	34%
<i>P 2.3.</i>	<i>Reduced pollution from agriculture and other sources</i>	\$187,000,000	\$560,000	\$186,440,000	100%
	Total per Pillar	\$3,653,000,000	\$1,996,560,000	\$1,656,440,000	45%
Pillar 3: Adaptation, mitigation and resilience to climate change					
<i>P 3.1.</i>	<i>Disaster risk reduction</i>	\$1,640,900,000	\$859,000,000	\$781,900,000	48%
<i>P 3.2.</i>	<i>Sustainable Infrastructure Development</i>	\$2,078,000,000	\$1,863,000,000	\$215,000,000	10%
<i>P 3.3.</i>	<i>Mitigation and low Carbon Development</i>	\$284,000,000	\$128,000,000	\$156,000,000	55%
<i>P 3.4.</i>	<i>Increased resilience at community level</i>	\$215,500,000	\$178,000,000	\$37,500,000	17%
	Total per Pillar	\$4,218,400,000	\$3,028,000,000	\$1,190,400,000	28%
Pillar 4: Environmental Governance, Gender, Human and Institutional Capacity Development					
<i>P 4.1.</i>	<i>Improved legislative and policy framework for the EFCC sectors</i>	\$148,000,000	\$62,000,000	\$86,000,000	58%
<i>P 4.2.</i>	<i>Improved Stakeholder Participation and Gender Equity in EFCC Sectors</i>	\$379,000,000	\$20,000,000	\$359,000,000	95%
<i>P 4.3.</i>	<i>Improved organizational processes and capacity for evidence based decision making</i>	\$99,000,000	\$61,000,000	\$38,000,000	38%
	Total per Pillar	\$626,000,000	\$143,000,000	\$483,000,000	77%
Total cost of CIP		\$9,854,500,000	\$5,521,560,000	\$4,332,940,000	44%

Overall, this analysis suggests a funding gap of around USD 4.3bn for the next five years, with the greatest funding gaps in the areas of pollution control, climate change adaptation and DRR.

Chapter 9. Institutional Arrangements

CIP implementation, coordination and monitoring involve regular and continuous communication with multiple stakeholders including around 10 to 12 ministries/divisions and 30 to 35 agencies. Therefore, while designing an institutional arrangement, emphasis has been given on defining a process and a mechanism that build on the existing institutional set up in the government. This would allow to institutionalize CIP coordination and monitoring. Moreover, attempt has been made to link the CIP to other multi-environmental agreements with a view to having a common platform for dealing with all the EFCC issues. Other key consideration in shaping up the institutional arrangement included ensuring acceptance and commitment from the key decision makers in the government, related country partners, CSOs and DPs; efficiency and precision in mobilization of resources, alignment to SDGs, FYPs and ownership of the stakeholders.

9.1 Institutional Arrangement for CIP monitoring, coordination and implementation

The organizational structure for CIP monitoring, coordination and implementation was the subject of an analysis carried out by a “Committee on CIP Monitoring Unit” established within the Ministry of Environment and Forests” on 31st December, 2015. On the basis of the analysis, the committee recommended that a “Policy Support and Investment Monitoring Unit (PSIMU)” will be established a unit directly under the Ministry of Environment and Forests²³. This institutional arrangement is like the one set up to monitor the country investment plan on agriculture, food security and nutrition²⁴.

Besides designing the organization structure for the PSIMU, the committee also recommended functions, working process, transition mechanism/ roadmap and other pertinent issues. The expected outcome of a functioning PSIMU is that the CIP will be effectively monitored and that the capacity to analyse and negotiate environmental policy issues will increase.

The approval of the PSIMU will require some time for the proposal to go through the needed government procedures. Therefore, an interim arrangement was recommended to ensure that monitoring and coordination will start as soon as the CIP is approved and continue until the PSIMU is established.

9.1.1 Functions of PSIMU

PSIMU will be designated and mandated to perform activities within following broad areas:

Policy advice, analysis, research

- Conduct EFCC related policy review, policy analysis and policy research;
- Assist relevant negotiation teams including COP;
- Prepare briefs, working paper as and when required for high level officials to be used in policy level discussions;

²³ Directly connected to the ministry/ division and proclaimed by the government as an attached department. Instruction No. 2(A) (34), page3. Departments are generally responsible for discharging executive functions while implementing the policy directions of the ministry/division. Attached departments will also function as data-base and provide ministry/divisions with suggestions/ advice on related technical issues- Instruction No. 6(2), page 4

Secretarial Instruction, 2014, Ministry of Public Administration (MoPA), The Government of People’s Republic of Bangladesh.

²⁴ See also: <http://fpmu.gov.bd/agridrupal/>.

- Provide inputs/ research findings to support formulation of national EFCC policy and programs.

CIP Coordination and Information Management

- Sensitize ministries/ divisions/ agencies associated with specific CIP related functions and coordinate among them for implementing specific programs/sub-programs;
- Help ministries/ divisions to align ADP portfolios with CIP and EFCC policy objectives;
- Act as EFCC data-hub and conduct information management activity;
- Coordinate EFCC data sharing/ exchange of information among the parties related to EFCC issues.

CIP Monitoring

- Collect and organize data on the basis of Result Based Monitoring (RBM) Framework from relevant ministries/ divisions/ agencies;
- Analyze data and prepare detailed annual monitoring report highlighting performance, progresses, challenges and recommendations for all the pillars/ programs/ sub-programs;
- Disseminate the report and monitor feedback. Process and analyze collected data and feedback, and suggest for reflections in future plans if found relevant.

Other National or International Negotiation/treaty-related Assistance

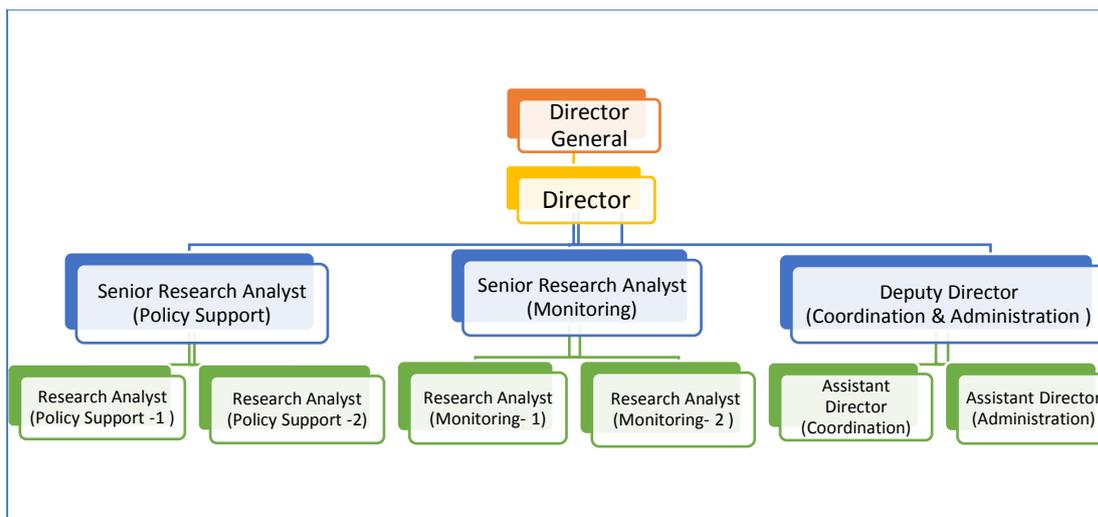
The proposed unit might be entrusted with other activities in order to make wide-ranging use of the information made available through the PSIMU, for example for other National and International purposes. This would also contribute to ensuring acceptance by the MoEF as well by the Ministry of Public Administration (MoPA) and Ministry of Finance (MoF). These activities may include-

- Assist in implementing NDC (Nationally Determined Contribution) and its road map;
- Assist in integrating NDC with CIP;
- Assist in observing MRV (Monitoring, Reporting and Verification) under REDD+ (Reducing Emissions from Deforestation and Forest Degradation) ;
- Help/support in conducting monitoring of implementation of Multi-Environmental Agreements in EFCC sectors including SDG (Sustainable Development Goals), COP (Conference of Parties), CFT (Climate Change Finance Tracking), BCCSAP (Bangladesh Climate Change Strategy and Action Plan, UNFCCC (United Nations Framework Convention on Climate Change, UNCCD (United Nations Convention to Combat Desertification), CBD (Convention on Biodiversity) and others.

9.1.2 Structure of the PSIMU

Under a sector-wide approach a number of other ministries and institutions will also be involved so it is important to have a well-structured coordination systems. The proposed PSIMU structure offers such a system. PSIMU will be headed by a Director General, and composed of 1 Director, 2 Senior Research Analysts, 1 Deputy Director, 4 Research Analysts, 2 Assistant Directors and other supporting staffs (fig 2). It is mostly in line with the units like FPMU under Ministry of Food or APSU under Ministry of Agriculture (for detail manpower structure and position-wise ToR see Annexure ... & ...). In addition to this there will be provision for hiring of 3 to 4 part-time experts (that will cover the technical areas of the CIP, namely environmental, forestry, climate change, and environmental stewardship issues) for conducting specialized research or policy analysis. During the period between the finalization of CIP and the establishment of the PSIMU, an interim arrangement will be in place. This will be composed of an Additional Secretary/ Joint Secretary (Development) performing supervisory role, and 1 Deputy Secretary/ Deputy Chief and 1/2 Senior Assistant Secretary/ Chief of the MoEF and a hired expert.

Figure 2: Structure of the PSIMU



9.1.3 Governance of the PSIMU

For the sake of better synchronization (coordination and communication) the CIP monitoring process is set in a unified framework which uses existing institutions like National Environmental Council, Executive Committee of National Economic Council and customized entities like CIP coordination Committee or Thematic Teams and others (fig ..). It is also noteworthy that for getting the best of them, the existing institutions need to be strengthened and make fully functional.

National Environmental Committee is a high level committee with the Prime Minister as chairperson. Members of the committee include Ministers and Secretaries of the concerned ministries/divisions. Secretary, Ministry of Environment and Forest is the member secretary of the committee. It has been set up to ensure an effective top level management of the environment and to integrate development and environment at the national level planning. Terms of references of the committee include- analysis of implementation status of the

National Environmental Policy and environmental programmes, considering the implementation of decision taken in United Nations conference on environment and development, identification of inter-ministerial conflicts and providing necessary direction in the case of implementation of the government environment related policies. This committee meets once a year and generally provides high level guidance to CIP implementation, policies and financing arrangements. It will be helpful to ensure political coordination of the CIP at the highest level.

Executive Committee of the National Environment Committee

This committee is chaired by the Minister for Ministry of Environment and Forest and represented by ministers of the Ministry of Agriculture, Ministry of Water Resources, Ministry of Shipping, Ministry of Disaster Management and Relief, Executive Chairman Board of Investment, secretaries of the concerned ministries/divisions, CCF, and others. This committee is responsible for analyzing and monitoring of implementation of the National Environmental Policy and the decision of the National Environment Committee, recommending for necessary amendment of the National Environment Policy, and other important environment related issues. This committee is to meet twice a year.

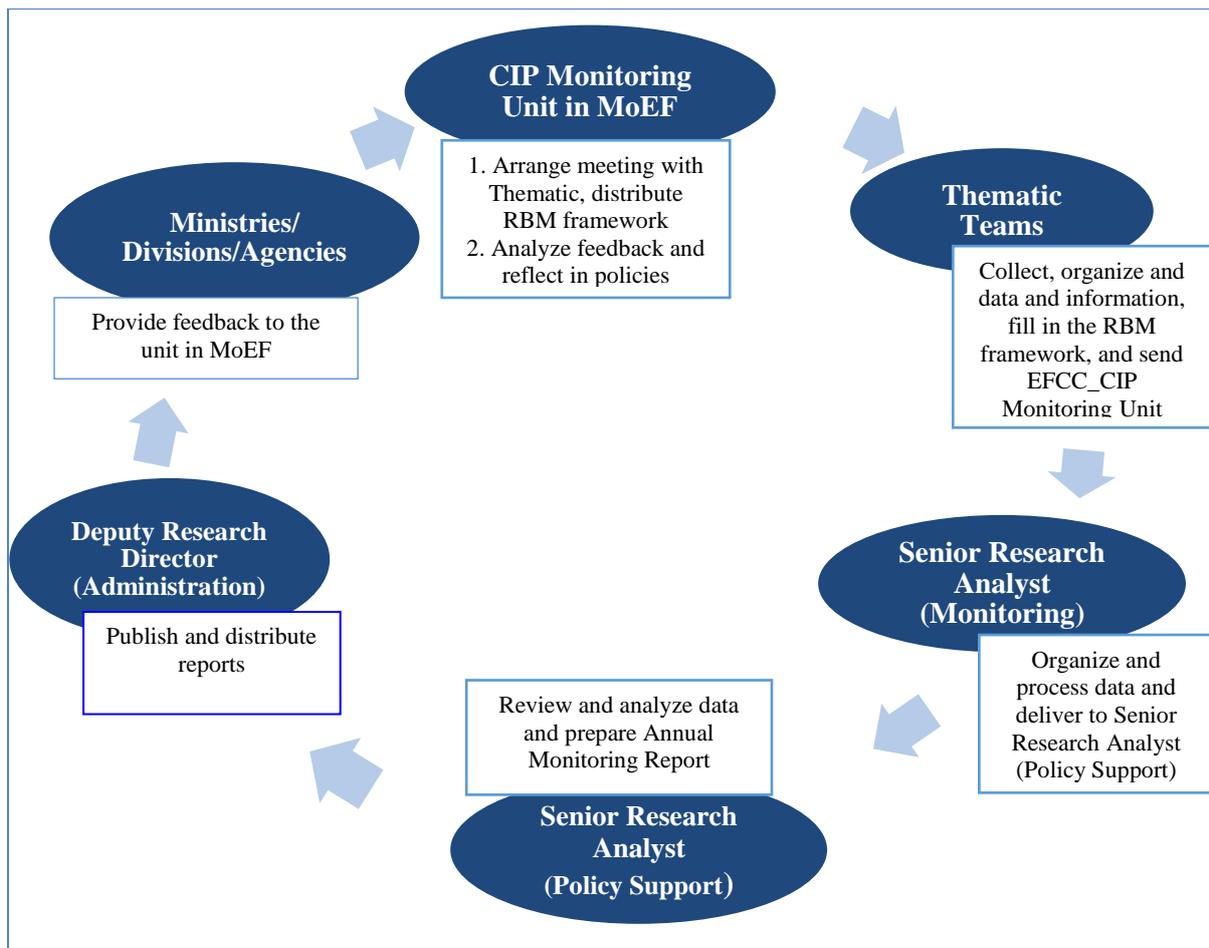
Thematic Teams

Pillar-based thematic teams will be formulated to facilitate the coordination and information sharing with other relevant ministries/ divisions/ agencies. These teams will comprise representatives from relevant ministries/ divisions/ agencies, preferably the focal points and officials who deal with EFCC issues. They will work as linking points in the process of collecting and exchanging information/ data from ministries/ divisions. Capacity building programmes on CIP implementation and monitoring with special focus on Result Based Monitoring (RBM) framework will be arranged for the members of the teams. Responsibility for overseeing gender and equity goals will be in the thematic team under pillar no.4.

9.2 Monitoring Cycle

The overall CIP implementation, coordination and monitoring activity will be synchronized by the Director of the unit. Senior Research Analyst (Policy Support), Senior Research Analyst (Monitoring) and other Research Analysts will be responsible for organizing, processing and analyzing the collected data/ information. ***An important output will be an (high quality) Annual Monitoring Report that would be widely distributed.*** Deputy Director (Coordination and Administration) along with the officials under his control will work for publishing and distributing the Annual Monitoring Report. But it will be the discretion of the Director General to reallocate/ redistribute the responsibilities among the officials of the unit as and when required.

Ministries/ Divisions will send their feedback on the Annual Monitoring Report. These feedbacks, if relevant, will be reflected; and the RBM framework will be modified accordingly. Monitoring process will continue following this cycle (Chart -3). Similar process can be followed in the case of providing assistance to monitoring of other EFCC related issues.



9.3 Conducting Policy Analysis and Research

Depending upon their own requirement or on request from other ministries/ agencies Senior Research Analysts/ Research Analysts with the help of the hired experts (if necessary) can undertake policy analysis and research, support negotiation teams or prepare policy brief, working papers and other documents.

Monitoring Dimensions

The CIP RBM framework involves regular review of progress made in implementing CIP actions, programmes, combined with monitoring of progress against achieving outputs, outcome/impacts. It also focuses on tacking strategies and actions being taken by the partners and stakeholders, and identifying new strategies and actions. CIP monitoring dimensions are

(Need discussion)

Chapter 10. Implementation challenges and way forward

The CIP is a strategic tool for the Government of Bangladesh that identifies areas for investment and provides a framework for dialogue and for collaboration between the different actors (Government, Development partners, NGO's, Private sector etc.) under the leadership of the Government.

The major risks associated with the implementation of the CIP, their possible mitigation measures and the ratings associated with them are presented in the table below. Given the *ambition and the complexity* of the CIP, most of the risks are rated moderately-high despite the risk mitigation measures taken at the design stage of the CIP.

Table 2. Risk mitigation

Risks	Risk mitigation measure	Rating
<i>Insufficient political commitment and ownership from Government and Partners may lead to continued development of “ad-hoc” and un-coordinated projects</i>	Keep a high political profile and the strategic focus. Have the CIP (at least) endorsed by key Government and LCG (DPs). Strengthen the dialogue with other partners in the EFCC sectors. Specify roles and responsibilities of various actors and stakeholders. Adopt principle of ‘constant improvement’	High
<i>Weak coordination: MoEF must play a critical role in facilitating coherence and monitoring of the CIP. However, the MoEF capacity needs to be enhanced. Capacity development should focus on strengthening the capacities for M&E (e.g., start with setting up the M&E systems (PSIMU))</i>	Put in place the Institutional settings and M&E systems as soon as possible. Implementation arrangements need to be further developed and additional resources mobilise to develop the countries capacities to coordinate effectively the investments. Adopt “constant improvement”	Very High
<i>Resources mobilised (from GoB and/or donors) are not enough to finance the CIP activities and thus may lead to limited results</i>	CIP needs to be mainstreamed into the GoBs planning and financial systems. Mainstreaming CIP into ERD’s outreach communications to motivate new/additional funds from development partners. CIP M&E may include monitoring of resource mobilization.	Moderate
<i>Insufficient gender mainstreaming and inclusion of youth and minority groups in programme activities</i>	Use of proactive targeting; gender-disaggregated M&E indicators: awareness raising by DPs and implementing partners; incorporation of gender and youth issues in all projects and trainings.	Moderately
<i>Although the environment affects many aspects of the social and economic life of BD, the capacity of the MoEF to support improved environmental management is limited.</i>	Strategic support needs to be ensured to strengthen the MoEF. This cannot be solved with one project. Continued support is needed.	High

Obviously, additional work needs to be done on a number of fronts to manage these risks while putting the CIP to work. This includes the development of an implementation approach/plan based on the institutional and monitoring arrangements (see chapter 9). There may also be scope for a public-private partnership (PPP) between the MoEF and the private sector where robust evidence is gathered and used to provide transparency and improve accountability.

Based on the Results Framework, the plan will define the coordination mechanisms between the partners by investment programme, clarify responsibilities and budgeting arrangements.

Way forward

The policy, economic, social and environmental situation of Bangladesh is very dynamic. The environment policy of 1992 and the forest policy of 1994 are being revised. So is the BCCSAP which runs till 2018. A Delta Plan is under preparation that will run till 2100. A Forest Sector Master Plan will be prepared in 2016 and a Forest Investment Plan is also being discussed. The GED is planning to develop an environmental sector plan to help operationalize the environmental objectives in the 7FYP. Climate finance continues to be a very dynamic area. Implementation of the Paris agreement will provide new opportunities and challenges. Climate change concerns such as “loss and damage” are likely to further shape national needs and opportunities. These developments are taking place while pressure on the environment will continue to increase and the threat of climate change grows larger.

In this context, the CIP must be considered a “living document” where evolving issues and emerging investment priorities can be adequately analysed and accommodated. An organizational entity that will facilitate policy analysis and investment monitoring is critical. In order to keep the CIP “alive” and to continuously learn from its performance the following considerations must be given attention:

- *Regular consultations and dialogue with main stakeholders (including the Development Partners) on the mobilization and use of funds (to be organised through the newly established Policy Support and Investment Monitoring Unit (PSIMU) see chapter 9;*
- *The PSIMU unit will be a critical M&E instrument in supporting the achievements of the CIP expected results and will **review and adapt the RF** based on their initial findings and learning experiences;*
- ***Pursue a strong engagement with the General Economics Division, Planning Commission, so that the CIP and 7th FYP fully align and integrate, and that other relevant planning and strategic documents are aligned with such as the Delta Plan, FSMP, NBSAP, NAP etc.***
- *Further **involve the Ministry of Finance** in order to increase financial resources in support of the priority programmes and activities of the CIP;*
- *Both the Government and the DPs will use the **financing gap identification and prioritization exercise** of the CIP as the base to allocate additional resources for investment under the programmes and priority areas of the CIP;*
- ***Active DPs should continue** to play a facilitation role to strengthen support from the DP community.*
- *As soon as specific projects and programmes have been jointly identified by the Government and the DPs a **more detailed project design** phase should be undertaken that includes, amongst others, (i) technical design and assessment of the proposals (ii) careful costing and financial plan (iii) clear implementation plan and procedures.*

Chapter 11. List of annexes

- List of consulted references
- List of consulted people and main consultation events
- Complete results framework
- Main linkages/synergies between BCCSAP and CIP
- Main linkages/synergies between 7FYP and CIP
- Main linkages/synergies between SDGs and CIP
- CIP Gender action Plan

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Annex 2: Main linkages/synergies between the Bangladesh Climate Change Strategy and Action Plan (BCCSAP, 2009) and the Bangladesh Environment, Forestry and Climate Change Investment Plan

Bangladesh Climate Change Strategy and Action Plan (BCCSAP, 2009)	Bangladesh Environment, Forestry and Climate Change Investment Plan (BEFCCCIP, 2015).
Theme 1: Food security, social protection & health security	
P1. Institutional capacity and research towards climate resilient cultivars and their dissemination	3.4.4. Support agricultural research programs to develop climate resilient cultivars. 4.3.3. Support to research and training.
P2. Development of climate resilient cropping systems and production technologies	3.4.4. Support agricultural research programs to develop climate resilient cultivars. 4.3.3. Support to research and training. Agro-forestry covered under sub-programme 1.1.1
P3. Adaptation against drought, salinity,	3.4. Increase resilience at community level
P4. Adaptation in fisheries sector	1.3. Sustainable management of Natural & man made wetlands including Marine Ecosystems 1.3.2. scaling up of aquaculture development
P5. Adaptation in livestock sector	In the Food Security CIP
P6. Adaptation in health sector	2: Environmental Pollution Prevention and Ecosystems restoration 2.2.1 household waste collection 2.2.2 Strengthen communities
P7. Water and sanitation in climate vulnerable areas	2.4. Enhanced Water, Sanitation and Hygiene
P8. Livelihood protection in ecologically fragile areas	1.1. Sustainable Management of Natural Resources and programme 1.2. Biodiversity conservation enhanced, more specifically 1.2.1. Co-management of protected area and 3.4. Increase resilience at community level (3.4.1. Community Adaptation)
P9. Livelihood protection of vulnerable socio-economic groups (including women)	Gender is mainstreamed throughout the CIP. However, specific attention in program 4.1.2. Gender Mainstreaming and inclusiveness of minorities in the EFCC sectors and Implementation of the Gender Action Plan

Theme 2: Comprehensive Disaster Management	Pillars/programs/sub-programs CIP
P1. Improvement of flood forecasting and early warning	3.1. Disaster risk reduction and mitigation. 3.1.1. support to the development of early warning systems
P2. Improvement of cyclone and storm surge warning	3.1. Disaster risk reduction and mitigation. 3.1.1. support to the development of early warning systems
P3. Awareness raising and public education towards climate resilience	3.4. Increased resilience at community level, 3.4.1. Community Based Adaptation. 4.3. Increased capacity for evidence based decision making 4.3.4. support to extension and education
P4. Risk management against loss of income and property	Not covered
Theme 3: Infrastructure development	Pillars/programs/sub-programs
P1. Repair and maintenance of existing flood embankments	3.2. Sustainable Infrastructure Development, 3.2.1. Support Sustainable management of Flood Control Mechanisms

P2. Repair and maintenance of cyclone shelters	3.1. Disaster Risk reduction and mitigation, 3.2.1. Support to development of cyclone shelters and storage facilities
P3. Repair and maintenance of existing coastal polders	3.2. Sustainable Infrastructure Development
P4. Improvement of urban drainage	2.2. Ecosystems restoration through waste management 2.2.1. Improve collection, management and treatment of solid waste and sewage water
P5. Adaptation against floods	3.1. Disaster risk reduction and mitigation 3.2. Sustainable Infrastructure development
P6. Adaptation against cyclones and storm surges	3.1. Disaster risk reduction and mitigation 3.2. Sustainable Infrastructure development
P7. Planning, design and construction of river training works to control river bank erosion	Not addressed (?)
P8. Planning, design and implementation of resuscitation of rivers and khals by dredging and desiltation	3.2. Sustainable Infrastructure Development

Theme 4: Research and knowledge management	Pillars/programs/sub-programs CIP
P1. Establish centre for research, knowledge management & training on climate change	4.3. Increased capacity for evidence based decision making 4.3.3. support to development and implementation of research and training plans
P2. Climate change modelling at national and sub-national levels	4.3. Increased capacity for evidence based decision making
P3. Preparatory studies for adaptation against sea level rise	4.3. (Note: P2 and P3 are part of ToR of Centre for Research, P1)
P4. Monitoring of ecosystem and biodiversity changes and their impacts	1.1. Sustainable management and 1.2. Biodiversity conservation enhanced
P5. Macroeconomic and sectoral economic impacts of climate change	3: adaptation, mitigation and resilience to climate change
P6. Monitoring of internal and external migration of adversely impacted population	Not addressed
P7. Monitoring of impact of various issues related to management of tourism	1.1.3. Small and medium forest enterprise development (promotion of ecotourism, etc) for food security and employment creation

Theme 5: Mitigation and low carbon development	Pillars/programs/sub-programs
P1. Improved energy efficiency in production & consumption of energy	2: Environmental Pollution prevention and ecosystems restoration
P2. Gas exploration & reservoir management	Not addressed (? 2.1.2. Prevent, reduce, and mitigate damages to natural ecosystems from oil spills and drilling)
P3. Development of coal mines and coal fired power stations	Not addressed
P4. Renewable energy development	3.3. development of low emission technology, 3.3.1 promote renewable energy sources
P5. Lower emission from agricultural land	Addressed in the Food Security CIP
P6. Management of urban waste	2.2. Ecosystem restoration through waste management 2.1.1. improve collection and treatment of waste and sewage water (e.g. household, medical waste) and sub-program 2.4.2 increase collection and treatment of sewage water in urban and rural communities
P7. Afforestation & reforestation programme	1.1. Sustainable Management of and socio economic benefits from forests enhanced esp. 1.1.1. Improve, reforestation, afforestation, landscape restoration and other agro-forestry practices
P8. Expansion of energy saving devices	3.3.1. promote renewable energy sources (e.g. solar energy systems, biogas systems, improved wood stoves,

	<i>modern wood energy systems)</i>
P9. Energy and water efficiency in built environment	<i>2.4. Enhanced Water Sanitation and Hygiene</i>
P10. Improvement in energy consumption pattern in transport sector and options for mitigation	<i>3.3.2. Support clean technology and low –emission vehicles</i>

Theme 6: Capacity building – institutional and human	Pillars/programs/sub-programs in CIP
P1. Revision of sectoral policies for climate resilience	<i>4: Human and Institutional Capacity for Environmental Stewardship</i>
P2. Mainstreaming climate change in national, sectoral and spatial development plans	<i>4: Human and Institutional Capacity for Environmental Stewardship</i>
P3. Strengthening human resource capacity	<i>4: Human and Institutional Capacity for Environmental Stewardship</i>
P4. Strengthening gender considerations in climate change management	<i>Mainstreamed in CIP. Addressed under sub-program 4.1.2. gender mainstreaming and inclusiveness of minorities Gender Action Plan</i>
P5. Strengthening institutional capacity for climate change management	<i>4: Human and Institutional Capacity for Environmental Stewardship</i>
P6. Mainstreaming climate change in the media	Not specifically addressed