Document of
The World Bank

Report No: ICR00004026

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF-14026)

ON A

GRANT

IN THE AMOUNT OF US$33.8 MILLION

TO THE

PEOPLE'S REPUBLIC OF BANGLADESH

FOR A

CLIMATE RESILIENT PARTICIPATORY AFFORESTATION AND REFORESTATION
PROJECT

UNDER THE BANGLADESH CLIMATE CHANGE RESILIENCE FUND (BCCRF)

June 30, 2017

Environment and Natural Resources Global Practice
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective May 17, 2017)

Currency Unit = Bangladesh Taka (BDT)
BDT 1.00 = US$0.01
US$1.00 = BDT 82.52

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ADP	Annual Development Program
AF	Arannayk Foundation
AIGA	Alternative Income Generating Activity
B/C	Benefit-Cost
BCCRF	Bangladesh Climate Change Resilience Fund
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BFD	Bangladesh Forest Department
CAS	Country Assistance Strategy
CBA	Cost-Benefit Analysis
CPG	Community Patrol Group
CPS	Country Partnership Framework
CRPARP	Climate Resilient Participatory Afforestation and Reforestation Project
DPP	Development Project Performa
DMRD	Disaster Management and Relief Division
EADS	Environment Agriculture and Development Services
ECNEC	Empowered Committee of the National Economic Council
EMF	Environmental Management Framework
ERD	Economic Relation Division
FDG	Forest-dependent Group
FMP	Forest Master Plan
GA	Grant Agreement
GIS	Geographic Information System
GoB	Government of Bangladesh
GPS	Global Positioning System
GRC	Grievance Redressal Committee
ICR	Implementation Completion and Results Report
ICS	Improved Cooking Stoves
ISR	Implementation Status and Results Report
IUCN	International Union for Conservation of Nature
LSP	Local Service Provider
M&E	Monitoring and Evaluation
MIS	Management Information System
MoEF	Ministry of Environment and Forests

MRSLF	Mutual Rotating Savings and Loan Funds
MTR	Midterm Review
NGO	Nongovernmental Organization
NPV	Net Present Value
NWFP	Non-Wood Forest Product
PAD	Project Appraisal Document
PBSA	Participatory Benefit Sharing Agreement
PDO	Project Development Objective
PV	Present Value
PIU	Project Implementation Unit
REDD+	Reducing Emissions from Deforestation and Forest Degradation Plus
RIMS	Resource Information Management System
RS	Remote Sensing
SF	Social Forestry
SMF	Social Management Framework
VSL	Value of Statistical Life

BANGLADESH
Climate Resilient Participatory Afforestation and Reforestation Project

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BANGLADESH
Climate Resilient Participatory Afforestation and Reforestation Project

Data Sheet

A. Basic Information

Country:	Bangladesh	Project Name:	Climate Resilient Participatory Afforestation and Reforestation Project
Project ID:	P127015	L/C/TF Number(s):	TF-14026
ICR Date:	10/26/2016	ICR Type:	Core ICR
Lending Instrument:	Specific Investment Loan	Grantee:	Ministry of Environment and Forests
Original Total Commitment:	US$33.80 million	Disbursed Amount:	US$32.68 million
Revised Amount:	US$33.80 million		

Environmental Category: B - Partial Assessment

Implementing Agencies:
 Bangladesh Forest Department
 Arannayk Foundation (AF)

Cofinanciers and Other External Partners:

B. Key Dates

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	10/31/2011	Effectiveness:	07/26/2013	07/02/2013
Appraisal:	06/14/2012	Restructuring(s):		01/08/2015 11/16/2016
Approval:	02/08/2013	Mid-term Review:	06/15/2015	08/12/2015
		Closing:	12/31/2016	12/31/2016

C. Ratings Summary

C.1 Performance Rating by ICR

Outcomes:	Satisfactory
Risk to Development Outcome:	Moderate
Bank Performance:	Satisfactory
Grantee Performance:	Satisfactory

C.2 Detailed Ratings of Bank and Grantee Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Satisfactory
Overall Bank Performance:	Satisfactory	**Overall Grantee Performance:**	Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators

Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes

	Original	Actual
Major Sector/Sector		
Agriculture, Fishing and Forestry		
Forestry	50	61
Public Administration		
Public administration - Agriculture, fishing and forestry	30	23
(Historic)Health and other social services		
Other social services	20	14
Major Theme/Theme/Sub Theme		
Environment and Natural Resource Management		
Climate change	28	28
Mitigation	28	28
Environmental policies and institutions	25	25
Renewable Natural Resources Asset Management	20	20
Biodiversity	20	20
Water Resource Management	20	20
Water Institutions, Policies and Reform	20	20
Social Development and Protection		
Social Inclusion	2	2
Indigenous People and Ethnic Minorities	2	2

Other Excluded Groups	2	2
Participation and Civic Engagement	2	2

E. Bank Staff

Positions	At ICR	At Approval
Vice President:	Annette Dixon	Isabel M. Guerrero
Country Director:	Qimiao Fan	Salman Zaheer
Practice Manager/Manager:	Kseniya Lvovsky	Herbert Acquay
Project Team Leader:	Tapas Paul	Shakil Ahmed Ferdausi
ICR Team Leader:	Darshani De Silva	
ICR Primary Author:	Darshani De Silva	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

The project development objective is to reduce forest degradation and increase forest coverage through participatory planning/monitoring and to contribute in building the long-term resilience of selected communities in coastal and hilly areas to climate change.

Revised Project Development Objectives (as approved by original approving authority)

Not applicable.

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1	**Area restored or re/afforested (ha) including area re-afforested**			
Value (Quantitative or qualitative)	0 Area re/afforested - 0	17,000 Area re/afforested - 17,000	—	17,519 Area re/afforested - 17,519
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (104%).** This contributes to the PDO sub-objective of increased forest coverage. The project established multispecies plantations with diverse species carefully selected based on their resilience and specific area being re-afforested and changed the general practices of mono species plantations. The survival rates of FY14 and FY15 plantations on average were 85 to 95 percent. On average, the survival percentage was found within the range of 66-100% for project plantations and 72-99% for plantations outside project area. This indicator included project-financed forest restoration activities.			
Indicator 2	**Forest users trained (including females and ethnic minority/indigenous people) (number)**			
Value (Quantitative or qualitative)	0 Females - 0 Ethnic minority - 0	15,000 Females - 7,500 Ethnic minority - 1,500	—	33,676 Females - 13,710 Ethnic minority - 1,605
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (including % achievement)	**Fully Achieved (225%; Females - 183%; Ethnic minority - 107%).** This contributes to the PDO sub-objectives of reduced forest degradation and participatory planning/monitoring. The achievements include 17,003 (including 4,960 women) trained under 5-day training organized by the Bangladesh Forest Department (BFD) and 16,673 (including 5,160 women members of the Forest Dependent Groups) and 3,600 women who received training on value chain improvement) for specific training conducted over a period by Arannayk Foundation (AF). These figures exclude 21,300 community members who had directly participated in short-term awareness creation events. This included all forest users identified under 200 targeted villages.			
Indicator 3	**Increased household income of beneficiaries participating in alternative income generating activities (percentage)**			
Value (Quantitative or qualitative)	0	70	—	88
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (126%).** This contributes to the PDO sub-objective of long-term resilience of selected communities built. This included income and asset levels measured through a census of the targeted 6,000 households selected from the poor forest dependent communities in 200 targeted villages for alternative income generating activities. These income generating activities included vegetable cultivation, poultry rearing, fruit plan establishment and value chain improvement in beef, cattle, milch cow and fish farming. This included the households that had increased their income by at least 30 percent as a result of project-financed alternative income generating activities.			
Indicator 4	**Reforms in forest policy, legislation or other regulations supported (Yes/No)**			
Value (Quantitative or qualitative)	No	Yes	—	Yes
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (100%).** This contributes to the PDO sub-objectives of increased forest coverage, reduced forest degradation and participatory planning/monitoring. National Forest Policy was updated. This included the process involved in updating, quality of the policy and current status.			
Indicator 5	**Government institutions provided with capacity building to improve management of forest resources (Number)**			
Value (Quantitative or qualitative)	0	2	—	2
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (100%).** This contributes to the PDO sub-objectives of increased forest coverage, reduced forest degradation and participatory planning/monitoring. Several capacity building programs and trainings, from short 2-day trainings to post-graduate programs for the BFD and Ministry of Environment and Forests (MoEF), were supported. These trainings helped improve their capacity to undertake their responsibilities more effectively, as well as to take a lead in setting up of improved forest assessment and monitoring systems and updating the Forest Master Plan of the BFD. This included total number of staff trained and qualitative improvements reported on post-training staff performance.			
Indicator 6	**Direct project beneficiaries (Number) including females (percentage)**			
Value (Quantitative or qualitative)	0 Females - 0	46,000 Females - 30	—	60,587 Females - 37.47

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (132%; females – 125%).** This contributes to the PDO sub-objective of long-term resilience of selected communities built. These figures included people whose income increased by at least 30%, 34,000 beneficiaries of value chain development and 187 local service providers. This excluded community members who received wages from daily labor in re/afforestation program and rehabilitation/reconstruction of field offices.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 7	**Increase in forest coverage (km) for strip plantation in target areas**			
Value (Quantitative or qualitative)	0	1,672	—	2,083
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (125%).** Links to PDO indicator 1. The survival of strip plantation ranged between 87-100%.			
Indicator 8	**Community jobs created through afforestation/reforestation program (million days)**			
Value (Quantitative or qualitative)	0	3	—	3.61
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (120%).** Employment as labor was generated for 72,803 male workers (78%) and 20,588 female workers (22%). It measures number of man-days of work generated for poor vulnerable people as daily labor in re/afforestation program and rehabilitation/reconstruction of field offices. This has no direct linkages to PDO indicators.			
Indicator 9	**At least 200 community groups have been targeted by the project through capacity building program and small grant funding, with at least 80% of their members being poor and a least 50% women (Number)**			
Value (Quantitative or qualitative)	0	200	—	200
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Target fully achieved (100%).** 200 community groups identified that meet the indicator criteria. Links to PDO indicator 2 and 3.			
Indicator 10	**Guidelines for program monitoring developed (Yes/No)**			
Value (Quantitative or qualitative)	No	Yes	—	Yes
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Target fully achieved (100%).** Links to PDO indicator 4.			
Indicator 11	**Forest Master Plan revised (Yes/No)**			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Value (Quantitative or qualitative)	No	Yes	—	Yes
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Target fully achieved (100%).** At the time of project appraisal, there was a Forest Master Plan (FMP) covering the period from 1994 to 2015 Links to PDO indicator 4.			
Indicator 12	**Forest Department officials and MoF trained on participatory processes, co-management, climate change impacts on forest and biodiversity (Number)**			
Value (Quantitative or qualitative)	0	397	—	436
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (110%).** Please see the details in annex 2. Links to PDO indicator 5.			
Indicator 13	**The number of cases of non-sustainable and illegal use of forest resources has been reduced by 30% in and around the project area through project interventions (%)**			
Value (Quantitative or qualitative)	10	30	—	57
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (190%).** This achievement was a result of (a) communities refraining from harvesting forest resources to meet livelihood and income needs, (b) surveillance of the forests around the villages by community inspection groups, and (c) ownership of the community groups in the plantations established in the buffer zone. Baseline 10% is what is generally expected as reduction in forest offences from social forestry projects in Bangladesh.			
Indicator 14	**Number of forest field offices rehabilitated/reconstructed (Number)**			
Value (Quantitative or qualitative)	0	43	—	76
Date achieved	June 30, 2012	December 31, 2016	—	December 31, 2016
Comments (including % achievement)	**Fully Achieved (177%).** The field-level forest offices were rehabilitated or reconstructed to provide better facilities to field-level staff for forest management. Links to PDO indicator 5.			

G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (US$, millions)
1	05/31/2013	Satisfactory	Moderately Satisfactory	0.00
2	09/15/2013	Satisfactory	Moderately Satisfactory	2.57
3	03/17/2014	Moderately Satisfactory	Moderately Satisfactory	3.48
4	09/29/2014	Satisfactory	Moderately Satisfactory	6.68
5	03/15/2015	Satisfactory	Moderately Satisfactory	9.19
6	10/03/2015	Satisfactory	Moderately Satisfactory	15.15

| 7	05/03/2016	Satisfactory	Satisfactory	19.98
8	09/06/2016	Satisfactory	Satisfactory	25.84
9	12/30/2016	Satisfactory	Satisfactory	29.24

H. Restructuring (if any)

Two level 2 restructurings were done in January 8, 2015, and November 16, 2016, which were approved by the Country Director.

The first level 2 restructuring was approved by the Country Director on January 8, 2015. This restructuring was done to make changes to (a) include training in the cost category, in the GA, consistent with other sections of the GA and PAD and (b) revise the definition of the operating cost to take into account (i) repair and maintenance of office building, including furniture to be used exclusively by the project and (ii) repair and maintenance of project equipment. US$ 26.08 million was disbursed at the time of restructuring. The PDO was rated as satisfactory and implementation progress was rated moderately satisfactory.

The second level 2 restructuring was approved by the Country Director in November 16, 2016. This restructuring was done in response to a recommendation made during the midterm review (MTR) in August 2015 to reallocate finances from the savings of Components 1, 3, and 4 to Component 2. This included US$1 million reallocation of funds to expenditure category '1b' of Component 2 and related change to share of expenditure under '1b' of Component 2 to be increased from 93.8 percent to 95.3 percent. US$ 27.8 million was disbursed at the time of restructuring and the PDO and implementation progress were rated satisfactory.

I. Disbursement Profile
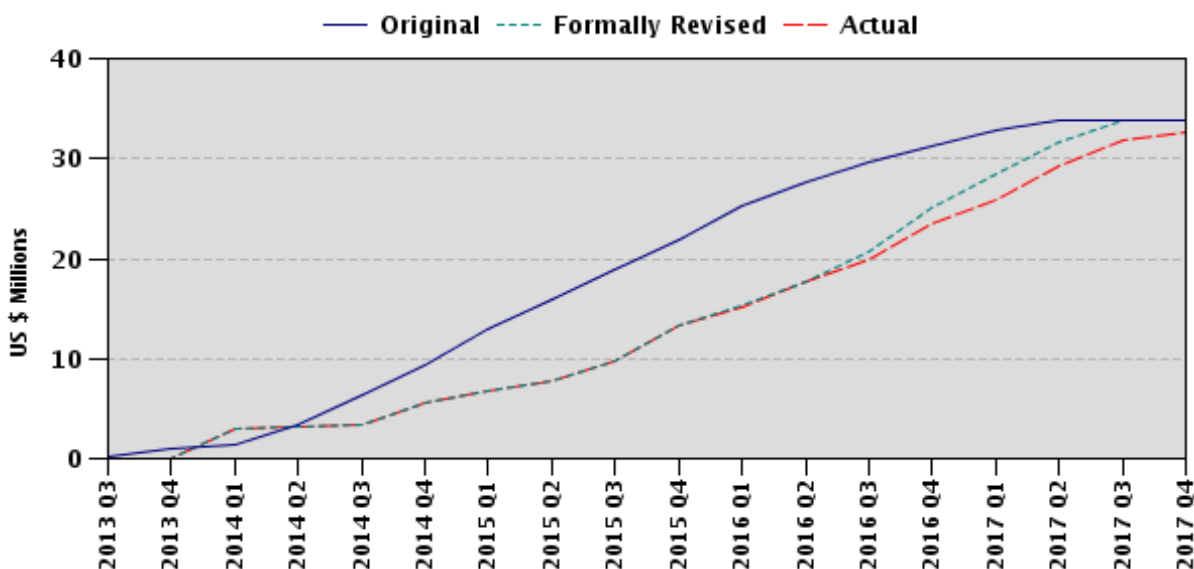
1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1.   *Country context.* Bangladesh is a low-lying, riparian country with highly fertile alluvial floodplains that drain into the Bay of Bengal through a constantly changing network of estuaries, tidal creeks, and an active deltaic coastline. The lower part of the country adjoining the Bay of Bengal is known as the 'coastal zone' and is characterized by a delicately balanced natural morphology of an evolving delta. Tropical cyclones, storms, and surges are major features of the coastal zone's climate. These storms have a significant negative impact on the area and its growing population of about 16 million people. Forest ecosystems and biodiversity are also vulnerable to current climate risks and future climate change. Bangladesh is among the most densely populated countries in the world. The pressure on natural resources in Bangladesh is very high. Two-thirds of the land area is under crops and cropping intensity has increased by 25 percent over the last 30 years with an imbalanced use of agricultural inputs and nutrient depletion. The share of land under forest cover is the second lowest in the region, with natural forest cover accounting for only half of that in the 1960s. Moreover, degraded forests and ecosystems are more vulnerable to climate change. In this context, participatory afforestation and reforestation in coastal and hilly areas will be a key contributor in meeting the challenge of climate change vulnerability and depleting forest resources.

2.   *Sector context.* Forests are very important renewable resources in Bangladesh and play a crucial role for the livelihoods of communities. It is estimated that at least 400,000 people are involved in the trade of forest products. Non-wood forest products contribute significantly in supporting the economic activities of at least 600,000 people. In addition, forests provide valuable ecosystem services and harbor tremendous biological diversity of flora and fauna. The past several centuries witnessed significant deforestation in Bangladesh, largely driven by illegal and unsustainable logging and harvesting, slash and burn agriculture, conversion of forested areas into non-forest land, including settlements, pastures, croplands, wastelands, or land used for recreational or industrial purposes. As a result, it is estimated that Bangladesh's forest cover has been declining by 2.1 percent annually in the last three decades alone. In 2013, the forest cover was estimated to be around 2.56 million ha, or 17.8 percent of Bangladesh's total land area. Since 1960, the Bangladesh Forest Department (BFD) has implemented afforestation programs on the coastal embankments, newly accreted coastal char lands and offshore islands, along the 710 km of coastline. Afforestation of foreshore and tidal areas outside the embankments proved to be a cost-effective method to dissipate wave energy and reduce embankment flooding during storm surges. The major challenge of afforestation and reforestation is in ensuring proper management and monitoring of existing forest resources. The improvement of forest resources management requires sector reforms such as revision of the forestry sector plan, establishment of forestry inventory and monitoring, ensuring of local communities' participation, and institutional strengthening for better planning and management.

3.   Forest legislation in Bangladesh dates back to 1865, when the first Indian Forest Act was enacted by the British Raj, followed by a comprehensive Indian Forest Act in 1927. Following Bangladesh's independence in 1971, an amendment of the Forest Act of 1927 was drafted in 1987 and approved in 1989. The Forest Act was further amended in 2000 and some major changes have been brought in. In addition, Bangladesh adopted the first National Forest Policy in 1979 with the objective of providing greater protection to forests and placing more emphasis on conservation of the country's forests while developing its rural and industrial economies. However, this policy had largely remained unenforced, resulting in little changes from the traditional colonial-industrial approach. In 1994, the BFD, under the Ministry of Environment and Forests (MoEF), introduced a new policy that represented a marked shift in the approach to forest management. Its stated objectives are to contribute to sustainable development and poverty alleviation through people's participation in forest protection and management and support for forestry development from a broader sector of society. Social Forestry (SF), a unique benefit-sharing mechanism for the community was introduced to share forest-based resources (for both non-wood forest products and

major forest products) through Forest (Amendment) Act 2000 and the Social Forestry Rules (approved in 2004 and amended in 2010 and 2011). In addition to the income and employment generation, SF introduced temporary community rights which are essential for sustaining local community interest to protect the forest and optimize the multiple use values as standing forests rather than clearing it for other land uses. However, the guiding principles and policies on forest management and overall forest sector planning existing at the time of the project preparation are not in harmony with the new incentive mechanisms that are being adopted in SF around the world for securing local community participation in sustainable forest management.

4.   In the broader context, forest management in Bangladesh has lacked a consistent plan or framework demonstrated by poor adoption of the Forest Master Plan (FMP) and subsequent Forest Management Plans. The Master Plan for 1995–2015 has not gained substantive traction as a guidance tool for managing the forest sector and it has not been reviewed or updated routinely to reflect the new and emerging dimensions of forest management. As a result, the plan does not cover new and changing paradigms for social and participatory forestry, climate change impacts, water resource management, biodiversity and wildlife conservation, institutional and capacity needs, and new financing for forest management. Also the absence of a systematic and routine inventory and monitoring of forest resources weakens the baselines data for proper forest sector planning. Data, when available, were often scanty, outdated, or unreliable. Forest inventory and assessments have been undertaken on an ad hoc basis with no formal and regular resource monitoring and assessment capability within the BFD. The existing data on forest growth rate, forest area, rate of forest loss, and forest density were inconsistent or had significant margins of error. Hence, obtaining reliable information on the country's progress with slowing deforestation and forest degradation was severely impaired. Considering that coastal and hilly areas are ecologically sensitive and extremely vulnerable with climate change already manifesting, adhering to a structured approach to development planning and disaster management was essential. Uncoordinated and disparate development interventions for afforestation could potentially lead to net degradation of coastal natural resources with the risk of excluding poor and vulnerable sections of local communities from accessing natural resources to support their livelihoods.

5.   ***Rationale for World Bank assistance.*** The World Bank actively worked with donors in a number of countries to support forestry and climate change initiatives. The Bank's comparative advantage as trustee to donor financing stemmed from its long-standing partnership with Bangladesh, its experience in community-driven and participatory approaches, addressing challenges identified above and its ability to leverage funding for long-term sustainability. The project was also relevant to the World Bank as it was in line with the second pillar of its Country Assistance Strategy (CAS) 2011–2014: Reduce Environmental Degradation and Vulnerability to Climate Change and Natural Disasters. The project was identified under the grant funding from the Bangladesh Climate Change Resilience Fund (BCCRF), which was established in 2010 to implement programs in line with the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) of 2009.

1.2 Original Project Development Objectives (PDO) and Key Indicators (*as approved***)**

6.   The PDO in the Grant Agreement (GA) is to reduce forest degradation and increase forest coverage through participatory planning/monitoring and to contribute in building the long-term resilience of selected communities in coastal and hilly areas of the Recipient's territory to climate change.[1]

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[1] The Project Appraisal Document (PAD) does not include the reference to 'of the Recipient's territory' but the GA has this and the PDO in the GA will be used for this assessment.

7.   The key indicators for achievement of the PDO originally approved and consistent with annex 1 on Results Framework were

    a. Area restored or re/afforested (hectare) including area re-afforested;

    b. Forest users trained (including females and ethnic minority/indigenous people) (number);

    c. Increased household income of beneficiaries participating in alternative income generating activities (percentage);

    d. Reforms in forest policy, legislation, or other regulations supported (Yes/No);

    e. Government institutions provided with capacity building to improve management of forest resources (number); and

    f. Direct project beneficiaries (number), including female (percentage).

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and Reasons/Justification

8.   There were no revisions made to the PDO or key indicators after project approval.

1.4 Main Beneficiaries

9.   The primary beneficiaries of the project were the communities living close to the target areas, as the afforestation and reforestation work was expected, in the long term, to provide a natural green belt (windbreaker) against cyclones and contribute in stabilizing denuded land. The project planned to directly support the communities by (a) creating around 3.18 million workdays in the afforestation/reforestation program and rehabilitation/reconstruction of office infrastructure; (b) providing alternative livelihoods support to around 6,000 poor and forest-dependent households in 200 communities to reduce their dependence on forest resources; and (c) training around 15,000 forest-dependent people on participatory forest management, climate change risks, and potential benefits. The project planned to ensure that women-headed households and other vulnerable people were given priority and communities close to the buffer zone and strip plantation benefited through their direct participation in the SF program. The project also expected to develop the capacity of the BFD for better planning and managing the forest resources with 397 staff to receive direct capacity-building support.

1.5 Original Components (*as approved*)

10.   The project was designed to support enhancing the resilience of forest ecosystem and communities in nine coastal and hilly districts through four components, as described in the following paragraphs.

11.   ***Component 1: Afforestation and Reforestation Program (BCCRF: US$20.90 million at appraisal; US$21.26 million at completion)***. The objective of this component was to increase the afforested/reforested areas through participatory forestry and co-management approach in the degraded forestland, marginal, fallow, and newly accreted land in coastal and hilly areas. In achieving the target of participatory afforestation and reforestation, the component also supported the rehabilitation/reconstruction of the existing field offices of the BFD. This component included two subcomponents.

(i) **Participatory Afforestation and Reforestation.** This subcomponent was designed to contribute to afforestation and reforestation of total 17,000 ha of land and 1,672 km of roadside plantation and included two types of forestry technologies (a) treatment and reclamation of coastal mangrove land and (b) treatment of the undulating terrain within 20 km radius of the coastal zone.

(ii) **Rehabilitation/Reconstruction of Forest Department Field Infrastructure.** The objective of the subcomponent was to rehabilitate and/or reconstruct 43 existing field-level offices in the project area to ensure proper operation of the BFD with an anticipation to generate local employment of about 3.18 million workdays.

12. ***Component 2: Alternative Livelihoods to Support Forest Communities (BCCRF: US$3.80 million & AF: US$0.19 million at appraisal; BCCRF: US$5.00 million & AF: US$0.19 million at completion).*** The objective of this component was to improve and diversify non-forest-based livelihood opportunities of poor forest-dependent households in selected forest communities. In the project areas, 200 community-based groups were planned to be formed to demonstrate alternative livelihoods options that not only conserve the newly planted areas but also help demonstrate reducing the dependency on forest resources. This component targeted 6,000 households comprising no less than 25,000 people in 200 forest communities in 9 project districts with a clear and sound selection method. The component also proposed to improve links with the BFD through mobilizing the targeted communities into forest-dependent groups (FDGs) that were expected to benefit from alterative income generating activities (AIGAs) and participate in SF and afforestation works. The component management, monitoring and evaluation (M&E), and reporting was to be done by the Arannayk Foundation (AF).

13. ***Component 3: Capacity Development for Forest Resource Planning and Management (BCCRF: US$5.23 million at appraisal; US$5.77 million at completion).*** The objective of the component was to improve the technical knowledge base on forest resource assessment, program monitoring, and long-term planning for the sustainable development of the forest sector. This component was aimed to improve forest management practices through three specific interventions: (a) improving the current management practices backed by technological interventions with the use of remote sensing (RS) and Geographic Information System (GIS) technologies; (b) building the capacity of the department where selected BFD officials and staff were to receive long-term and short-term trainings on the impacts of climate change on biodiversity and forests, community mobilization and participatory process, land use planning, methods to design and implement policy, programs, and projects in coastal and hilly areas; and (c) reviewing and revising the existing FMP (1995–2015).

14. ***Component 4: Project Management (BCCRF: US$3.37 million; Grantee: US$1.00 million at appraisal; US$2.97 million & US$ 1.2 million).*** This component was to support the establishment of a Project Implementation Unit (PIU) in the BFD for implementation of Components 1 and 3 and provide the necessary support for financial management, social and environmental safeguards, communication, and procurement to the AF.

1.6 Revised Components

15. The project components were not revised during the lifetime of the project after project approval.

1.7 Other Significant Changes

16. The project was restructured twice.

17. The first level 2 restructuring was approved by the Country Director on January 8, 2015. This restructuring was done to make changes to (a) include training in the cost category, in the GA, consistent with other sections of the GA and PAD and (b) revise the definition of the operating cost to take into account (i) repair and maintenance of office building, including furniture to be used exclusively by the project and (ii) repair and maintenance of project equipment. US$ 26.08 million was disbursed at the time of restructuring. The PDO was rated as satisfactory and implementation progress was rated moderately satisfactory.

18.   The second level 2 restructuring was approved by the Country Director in November 16, 2016. This restructuring was done in response to a recommendation made during the midterm review (MTR) in August 2015 to reallocate finances from the savings of Components 1, 3, and 4 to Component 2. This included US$1 million reallocation of funds to expenditure category '1b' of Component 2 and related change to share of expenditure under '1b' of Component 2 to be increased from 93.8 percent to 95.3 percent. US$ 27.8 million was disbursed at the time of restructuring and the PDO and implementation progress were rated satisfactory.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

19.   ***Soundness of background analysis.*** The project was aligned with the World Bank's CAS and the Government's strategy on responding and building resilience to climate change impacts. The project was clearly linked to the CAS of 2011–2014 under Strategic Objective 2—Reduce Environmental Degradation and Vulnerability to Climate Change and Natural Disasters. The project was aligned with the Bangladesh Sixth Five Year Plan (FY11–15) with the specific task of conducting climate-resilient afforestation and reforestation of hill forest land, coastal areas, and plain land forest and creating the Coastal Green Belt and enhancing access to input materials, including seeds and seedlings to prevent the extent of damage by cyclones and tidal surges. In addition, funds from the BCCRF were mobilized to support the BCCSAP of 2009, which integrates climate constraints and opportunities for economic and social development of the country. The BCCRF was set up aiming at building a climate-resilient economy and society in Bangladesh through adaptation to climate change, as well as mitigation for low carbon development path.

20.   The project design was influenced by the World Bank's past experience in Bangladesh's forestry sector, including three forestry projects between 1980 and 2001.[2] One of the significant lessons taken into consideration was the importance of involving forest-dependent communities in the plantation activities. In this regard, the project involved the forest community of the targeted project areas in the planning process[3] and included a component to support alternative livelihood to reduce their dependency on forest resources,[4] as well as to ensure benefit sharing. Specifically, past experience, as well as consultations with stakeholders, including community representatives identified the importance of (a) engaging communities and inclusion for conservation (including forest dependency by developing partnership with the BFD and livelihood improvement), (b) viability and sustainability of AIGAs through training and skill development in business development and value addition, and (c) financing arrangements through group savings (mutual rotating savings and loan funds [MRSLF]).

21.   ***Assessment of the project design.*** Project conceptualization (October 2011) to effectiveness (July 2013) took about one year and eight months. At the project concept stage, it was envisaged that the project will commence implementation by July 2012. However, it took about nine months to get the project approved after the decision to appraise and another five months to become effective and commence implementation because of challenges faced due to issues in getting the project captured in the Development Project Performa (DPP) and Annual Development Program (ADP) (refer to section 2.2 for further details).

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[2] Mangrove Afforestation Project (Cr. 1042-BD; Credit Amount US$11 million, implemented between 1980 and 1986); Second Forestry Project (Cr. 1634-BD; Credit Amount US$28.0 million, implemented between1986 and1992; and Forest Resources Management Project (Cr. 2397-BD; Credit Amount US$53.23 million, implemented between 1992 and 2001).
[3] Specifically consulting the communities ensuring that the proposed overall design was acceptable to the forest community needs and expectations.
[4] Forest-dependent communities mostly depend on illegal and informal extraction of forest resources for subsistence and limited surplus trade.

This was a consequence of complex design discussions with the donors of the BCCRF and the World Bank team did not foresee possible conflicts with the BCCRF conditions and the country approval system.

22.   Based on prior experience, at the time of the project design, the country was using the principle of keeping 50 percent of forest accreted land under forest cover in reserve forest status even after a 20-year forestation and soil stabilization cycle and returning the remaining 50 percent to the Ministry of Lands to be demarcated for other land use, ensuring that the protective attributes of the forest shelterbelt system and the land stability in the coastal area are not compromised after 20 years. Therefore, the project was designed to undertake afforestation and reforestation only in areas belonging to the BFD. As a pilot project that allowed testing of methodologies, the project also adopted a flexible approach to the forest rotation period. The project design explicitly recognized the challenge of a three-year implementation period for afforestation/reforestation and therefore, obtained prior agreement with the BFD to ensure maintenance and monitoring beyond the project period.

23.   The project was designed to be mainly implemented by the BFD through a PIU. The AF was identified for implementing the livelihood component because of its experience and the BFD's limited expertise, staffing, and experience in mobilizing communities for the proposed types of work and implementation modality. Lessons on the need to develop a long-term sustainable plan for staffing and institutional mechanism that would sustain project outcomes were also integrated into the design. In the absence of a legal mandate for the BFD to create community grant funds under the department, as a pilot project, the use of the experienced AF, which was better positioned to lead the livelihood component, was assessed as the best available option.

24.   The project's quality at entry, specifically its realism and the degree of complexity, indicates that many of the implementation challenges were identified adequately and incorporated into the design as described earlier. The project preparation period, although relatively lengthy and limited the project to a three-year period, was well used to ensure implementation readiness, which was demonstrated by its ability to achieve all its identified results indicators. The project was unable to identify a suitable set of indicators to demonstrate the achievement of the PDO (refer to section 2.3 on Monitoring and Evaluation for details).

25.   ***Adequacy of the Government's commitment.*** The preparation entailed a participatory and inclusive process of direct and systematic engagement with beneficiary communities in the planning, selection, and implementation of activities. Most of these was done during the design stage as part of the safeguard requirements. The Government of Bangladesh's (GoB's) commitment to address climate-resilient, participatory re/afforestation was demonstrated by (a) the existing BCCSAP which provided the climate change actions prioritized for the sector and (b) the request to provide assistance to update the Forest Sector Policy and FMP to make them implementable and to capture the emerging aspects such as climate change. The BFD also provided a team of officials to work closely with the World Bank to undertake preparation activities. Finally, as its contribution, the GoB committed US$1.2 million for project implementation.

26.   ***Assessment of risks.*** The project design identified several potential risks associated with country and sector governance, stakeholder involvement, implementation agency capacity and governance, and project operating environment and related mitigation measures. The overall risk of the project was rated Substantial. The rating proved to be appropriate for the type and scale of the proposed interventions as well as the level of capacity, commitment, and governance within which the project was to be implemented. The project design also included a Governance and Accountability Actions Plan focused on strengthening transparency mechanisms, ensuring meaningful participation of all eligible beneficiaries in all stages of the project cycle, and enhancing accountability through continuous monitoring.

2.2 Implementation

27.   Project implementation was completed satisfactorily within the originally proposed completion date, meeting all outcome/output targets and with 96.7 percent grant funds projected to be disbursed by financial closure (reported as of April 2017). Implementation progress was reported, in Aide Memoires and Implementation Status and Results Reports (ISRs), to be Moderately Satisfactory throughout the first two years of the project period because of delays in implementing Component 3 and some fiduciary and safeguard weaknesses. It became Satisfactory during the last year of implementation, acknowledging the efforts made by the implementing agencies to address delayed procurement activities and improvements made on social safeguards, such as satisfactory completion of safeguard screening, robust and well-implemented consultation and communication strategy, and the BFD's agreement to prepare site-specific Social Management Plans to mitigate any disruption in livelihoods with the AF's assistance.

28.   The project did suffer from early implementation delays. The two main causal factors are the following:

(a)   Delay in the project effective date affecting especially the implementation of Components 1 and 2 because there was a need of a 12-month cycle to select participants, collect seeds, produce seedlings, and prepare planting sites, reducing the project to two full planting seasons. The reason for this delay was noted in the first Implementation Support Mission (ISM) where it states that as the first stand-alone project under the BCCRF,[5] the project required a DPP and ADP, which were delayed as the new procedures required clarity of the concerned ministries and Planning Commission.

(b)   Inability of the Government to provide retroactive financing and partial allotment of first year funds, which affected the planting activities, as the project was not included in the ADP.

29.   As mentioned earlier, there was delay in approving the revised DPP for the project, owing to the continued confusion about the procedure for approval and the overall governance structure of the BCCRF, thus impeding the work between mid-2015 and early-2016. The project recovered the lost time due to accelerated implementation during 2016. The Component 3 studies were delayed because of the perceived security risk issues in Bangladesh during mid-2016 as reported in the last ISM. Even with these challenges, the project progressed well with strong commitments from the MoEF and BFD. Few operational challenges in fiduciary and safeguard compliance were present in the PIU until the latter part of the second year of project implementation. These were corrected subsequent to the MTR (refer to section 2.4 for details).

30.   During ISMs, the World Bank team met with the BCCRF's contributing partners to present the progress of the project and discuss issues and challenges pertaining to climate resilience activities in the forestry sector. Challenges in matching the operational differences between the BCCRF and the grantee systems, as well as the complexity of the operating principles of the BCCRF that were less adaptive to changes and needs identified during implementation, continued to be present throughout the implementation period. Within these challenges, during the MTR, the project design was reconfirmed that no change was needed in design and institutional arrangement for project implementation. The design of

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[5] This was the only stand-alone project; all the rest were additional funds to existing projects and one was managed through a nongovernmental organization (NGO) that did not require DPPs. The project processing initially followed a new governance system specifically designed for the BCCRF, described in the Operations Manual for the fund designed by a U.K. Department for International Development consultant with World Bank inputs. The Planning Commission only includes projects in the ADP which are approved by the Empowered Committee of the National Economic Council (ECNEC) (presided over by the Prime Minister at the Planning Commission). Although the manual refers to inclusion of the ADP, it was not clear how to include the ADP because it was not approved by the ECNEC. The World Bank team had a series of meetings with different government ministries, including the MoEF, Planning Commission, Economic Relation Division (ERD), and Finance Ministry to resolve the issue.

the project was also assessed to be adequate during the MTR in demonstrating climate resilience through increasing the afforested/reforested areas with adequate native and multiple species, diversifying community livelihoods, and strengthening institutional capacity.

31.   By the MTR, the physical activities under Components 1 and 2 exceeded the midterm targets and were on track to achieve the final targets. There were some delays in procuring some of the consultancy services under Component 3 (in particular to revise the FMP). Geocoding, supported by GIS-based geo-referenced mapping, was completed for all the afforested and reforested areas. The MTR identified two specific areas for further quantitative assessments (to provide additional evidence with respect to outcome indicators), including (a) assessing the impact of alternative livelihood interventions on reducing forest dependency and forest degradation and (b) assessing the resilience impact due to afforestation/reforestation activities and AIGAs.

32.   During the MTR, the MoEF and the BFD requested to include preparation of a high-resolution coastal zone land use map demarcating the potential sites for development of green belt that can help reduce the impact of cyclones backed by a GIS-based map covering the entire coastal zone of the country with real-time decision support system. Although this activity was not included in the original project implementation plan, it was assessed to be still within the scope of Component 3 and its inclusion would not require revision to the formal project description or project design. It was also noted that adequate funds were available within the project, and budget provision was made through reallocation during first restructuring.

33.   During the MTR, it was noted that the key risk to the project was sustainability of the interventions and assets created after closure of the project as the project duration was too short. Reassurance from the MoEF and BFD was obtained to ensure allocation of resources for maintenance of plantation. It was agreed that the AF will focus on community-level value-chain activities in the remaining period of the project and ensure institutional and financial sustainability of established groups. The AF also committed to support the FDGs with their own resources beyond the project period.

34.   Midcourse reallocation was made within the existing disbursement categories. As mentioned earlier, the project was restructured to capture this change, including utilization of a part of the savings made because of the U.S. dollar and Bangladesh taka exchange rate fluctuations.[6] However, currency savings in the post-MTR period was not used (as a late proposal for adding an activity to use the savings did not get support from the BCCRF Steering Committee).[7]

35.   Throughout the project implementation, the ISRs were timely and were reasonably well detailed about the project's progress and issues. The Aide Memoires systematically reported the physical and financial outputs.

2.3 Monitoring and Evaluation (M&E) Design, Implementation, and Utilization

36.   *M&E design.* A Results Framework and a participatory M&E mechanism were part of the PAD. The indicators of the Results Framework were overall inadequate to report on the objectives of the project. The indicators were designed mostly to respond to component-level objectives and less on the theory of change needed to achieve the PDO. Direct indicators to measure the reduction in forest degradation,

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[6] The plan proposed, at the MTR, was to maximize the project's benefits by diverting the savings to (a) strengthen AIGAs, including creating community assets, enhancing alternative and climate-resilient livelihoods, and promoting participatory forest planning systems); (b) create 3-D maps for the potential green belt in the coastal zone backed by a decision support system that can be used by all departments in reducing climate vulnerability; and (c) provide additional protective measures for reconstruction of field offices in saline areas.

[7] This issue was not reported in the ISM documentation but was shared as the reason during the review of the ICR.

participatory planning, and resilience of the selected communities to climate change were not included as part of the key results indicators. Instead, proxy indicators including capacitated Government institutions and supporting reforms to forest policy that could contribute to ensuring reduction in forest degradation and increased household income of community beneficiaries that could reduce the pressure on forest resources and improve their resilience to climate risks because of financial stability were included to demonstrate the achievement of these aspects. In addition, an intermediary indicator on reduction of forest offences was included in support of reduction in forest degradation. The indicator on 'Reforms in forest policy, legislation, and other regulations supported' was too broadly defined and could have been revised to a more targeted indicator, once it was clear that only updating of the forest policy will be supported by the project or the indicator could have been defined differently.

37.   The PAD specifically identified M&E for Component 2 on alternative livelihoods, which was to be based on a relevant and clear-cut strategy and plan developed by the AF. As part of this, the AF was to develop (a) M&E strategy and plan and train partner NGOs for implementation, starting from the baseline survey, (b) indicators for monitoring of implementation processes and progress, and (c) the methodology for evaluation of intermediate and final outcomes and impacts. The AF Secretariat was also responsible to carry out periodic monitoring of project implementation and review progress by undertaking field visits. The implementing partner NGOs were to submit quarterly and annual progress reports to the AF Secretariat.

38.   A third-party independent M&E of the project results was also included in the design.

39.   *M&E implementation.* The PIU and the AF were responsible for project M&E and tracked progress of the agreed indicators under the relevant components. M&E reporting was done through quarterly and annual progress reports that described the progress on physical outputs, site-specific activities and their progress, status of civil works, implementation of safeguard instruments, updated on technical studies and training, and significant issues, including those related to procurement and financial management. During ISMs, the progress of M&E was presented by the PIU and AF.

40.   The BFD developed a robust GIS and RS that allow the monitoring of all the plantations online beyond the project period. The AF undertook all the necessary actions to fulfill M&E requirements as described in the design, including developing and utilization of the methodology for surveys for reporting on alternative livelihoods and income. Timely completion of independent monitoring was assessed to be weak, because of complexity of the scope and inadequate understanding between the project and the consultant on the expectations. The data and information collected found to be of good quality, although the assessment was weak and because of the delay, the data could not be utilized for project implementation decision-making. The study conducted by the International Union for Conservation of Nature (IUCN) on boundary delineation and area assessment of afforested/reforested sites was useful as provided verification of field-based activities through mapping and monitoring of the survival of planted areas. IUCN's data produced on beneficiaries and safeguards were not fully verified, as the database was produced based on secondary data. These different methodologies adopted by different entities collecting the baseline and monitoring data resulted in differences in the results presented in different documents. For example, the independent monitoring consultancy firm developed a new set of baselines at the time it was contracted rather than verifying and making adjustments, if needed, to the baselines identified during the project design and what was developed by the AF for livelihood-related activities during implementation. Different sampling intensities under the different methodologies could have affected the data quality generated from the project. There was no indication that the reconciling of data generated by the project implementing agencies and independent monitoring consultant were done. This gave rise to challenges in identifying the correct set of data to be used during the project completion review.

41.   There was no reporting or data available on participatory monitoring. There were anecdotal evidence of AF using participatory monitoring of activities under Component 2 and community patrolling of afforested/reforested areas under the project.

42.   During the MTR, the World Bank team, together with the MoEF, BFD, and AF, revisited the PDO and results indicators to ensure their relevance to the project. Eight options to make the PDO more focused and result oriented were looked into and reported in the MTR Aide Memoire. Based on the discussions on the issue of modifying/revising the PDO, as well as the PDO indicators to avoid any potential negative assessment at the completion of implementation, it was concluded that none of the options provided a substantial improvement over the current PDO and that the PDO remained valid. In addition, two specific areas were identified for further quantitative assessment without adding any indicators: (a) assessing the impact of alternative livelihood interventions on reducing forest dependency and (b) assessing the resilience impact due to afforestation/reforestation activities. While these assessments were undertaken by the independent monitoring consultant, the data types used were inadequate to directly attribute the impact of these indicators. It was specifically noted that these additional quantitative assessments were not intended to replace any of the indicators nor were additional indicators (that may be construed as 'not included in the original Results Framework') intended to provide additional evidences with respect to the original PDO indicators only.

43.   *M&E utilization.* The monitoring responsibilities were carried out by the PMU, the AF and the BFD. Data collection at all levels was adequate, except the independent monitoring group where delays in reporting were noted. The BFD staff and the AF's two partner organizations that supported component 2 received training in data collection. Consolidated M&E reports were prepared and submitted bi-annually by the PMU. The data collected were evaluated and used for decision-making on project implementation. Success demonstrated by high achievement of outputs ensured government commitment to obtain additional future investments on participatory forest management and climate change risk management.

2.4 Safeguard and Fiduciary Compliance

44.   *Environmental and social safeguards.* During project preparation, the World Bank's safeguard policies were complied with. The project was designated as an Environmental Assessment Category 'B' considering the risk associated with the site clearance of plantations, species selection, use of fertilizer/pesticides/herbicides in the plantation program, minor construction-related disturbances, and community-level livelihood options. The project triggered safeguard policies on Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Forests (OP/BP 4.36), Indigenous Peoples (OP/BP 4.10), and Involuntary Resettlement (OP/BP 4.12). Although, the project was to use pesticides in the plantation program, Pest Management (OP/BP 4.09) was not triggered but relevant processes to address potential negative impacts were included in the environmental safeguard instrument.

45.   An Environmental Management Framework (EMF) and Social Management Framework (SMF), which also included an Indigenous Peoples Planning Framework, were prepared as safeguard instruments, as the detailed activities had not been identified. The frameworks were prepared in consultation with stakeholders and described the general baseline condition and typical safeguard impacts from different types of activities during preparation, design, construction, and operation; guidelines to comply with national legislation; and World Bank safeguards policies, defining the environmental requirements needed for reconstruction/rehabilitation of infrastructure in the forest, laying out the procedures for simple screening of the cooperative-level AIGAs and environmental code of practice for various project activities. The EMF and SMF were disclosed both in country (May 17, 2012) and at the World Bank's InfoShop (June 29, 2012).

46.   Overall, the project implementation had not induced any significant safeguard issues. There were no involuntary resettlements and no recorded negative impacts toward indigenous communities. However, it was noted during the Implementation Completion and Results Report (ICR) mission that the two different participant selection processes adopted by the BFD and AF had created some conflicts within the communities, which were not fully resolved. Both the selection processes had merits as they were based on sound principles. Conflicts appear to be because of the inconsistency in following the processes and inadequate awareness among the communities on the two processes as joint awareness by the BFD and AF seems to have not taken place. During the first half of project implementation, the safeguards were rated Moderately Satisfactory. The reasons for this included delay in setting up the Grievance Redressal Committees (GRCs) at the range level before commencing afforestation/reforestation activities and inadequacies in timely submission of reports. It was also reported that only 30 complaints were received during the lifetime of the project, which was only about 0.1 percent of the targeted community. The safeguards rating was upgraded to Satisfactory during the second half of the project, with an assessment that all required actions according to the EMF and SMF were fulfilled.

47.   ***Fiduciary.*** During preparation, the World Bank team undertook a fiduciary assessment and identified potential risks, including inadequate capacity to manage fiduciary activities and necessary mitigation measures. The fiduciary risks were identified as substantial. The Project Operations Manual provided an overview of fiduciary arrangements and delineated the roles and responsibilities of the various implementing agencies.

48.   During the first two years of the project, the fiduciary performance was rated Moderately Satisfactory, particularly related to procurement management. As reported in the Aide Memoires, this rating was due to delays in getting procurement staffing and challenges in retaining them and some gaps identified in internal control at the field level. The rating was upgraded to Satisfactory during the last year of project implementation This upgrade was based on the actions taken by the implementing agencies, including the filling up of key consultant and staff positions and the project following the approved financial management manual to ensure an effective internal control system. Through this project, the BFD launched the e-procurement process and completed all necessary training for its staff. There were no issues related to the submission of interim unaudited financial reports and annual audit reports and no reported misprocurement of activities.

2.5 Post-completion Operation/Next Phase

49.   The project financed capacity building of the BFD staff both centrally and at the field level to improve the internal accountability and integrity mechanisms. A continued partnership with the AF is also necessary to sustain the project outcomes, until (a) the communities become independent in associating with the BFD field offices and (b) changes are made to the BFD's legal mandate to formally partner with communities in managing plantations and supporting the improvement of their livelihoods and benefit sharing. There were also suggestions regarding the BFD moving out from plantation management and giving this responsibility to the communities through the local government system, if the communities and local governments are assessed to be ready to take up such responsibility.

50.   The project was designed and implemented as a pilot effort and confirmed by the selection of the project sites. To ensure maintenance of plantations created particularly during the last round of planting, additional financial support will be needed. It was argued that even if the GoB would be able to provide some financing for the maintenance and monitoring of some of the established plantations, it may require external funding for maintenance and monitoring, as well as extending the efforts on a wider geographical scale. The BFD and MoEF have decided to provide for maintenance of the plantation beyond the project

period (2017 and 2018)[8] from the revenue budget to bridge the gap until additional external resources are secured. BDT 8,627,359 has been released in 2017 to the 10 forest divisions that participated in the project for (a) second year maintenance of 4,681 ha of core and buffer zone plantations, 2,970 ha of mangrove plantations, 560 ha of non-mangrove coastal plantations, and 560 km of strip plantations planted during 2014–2015 and (b) first year maintenance of 2,535 ha of core and buffer zone plantations, 1,382 ha of mangrove plantations, 444 ha of non-mangrove coastal plantations, and 495 km of strip plantations planted during 2015–2016. As the survival rate and level of establishment were high, it was assessed that a third year of maintenance may not be necessary.

51.   The project included provisions for building institutional capacity at the forest-dependent community levels and for establishing appropriate institutional network at the union level with other forest-dependent communities. It was documented that some of the groups have already been functioning independently with minimum support, while most of the groups need support for continuous follow-up. There may be some dependency on the wages provided to the community to be involved in afforestation and reforestation activities, particularly those households that did not benefit from livelihood activities and did not have permanent alternative means to generate regular income. It was reported in the previous Aide Memoire that (a) forest-dependent community groups can sustain with the revolving funds established by the project and (b) the AF has committed about US$300,00 from its own resources to support these community groups in FY17 and FY18. In addition, the AF has put through a proposal of US$1.7 million to the United States Agency for International Development for expansion of alternative livelihood support activities. It is expected that in another couple of years the communities will be independent enough to function on their own without additional external support.

52.   A forestry sector project was included in the lending pipeline of the Country Partnership Framework (CPF) FY16–20. The ERD has expressed support for a future follow-up initiative and recognizes forestry as one of the priority sectors in the Seventh Five Year Plan, which promotes people-oriented forestry programs targeting conservation and economic development. The GoB is pleased with the pilot demonstrations done by the project and has already the requested the World Bank for a project budgeted of US$175 million, to scale up this project. This is currently under preparation.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design, and Implementation

Ratings: Relevance of objectives – High; Relevance of design – Substantial.

53.   ***Relevance of objectives.*** The objectives of the project are highly relevant, timely, and appropriate to the current needs of Bangladesh's renewable natural resource sector and consistent with the Government's commitment on climate change mitigation and adaptation, both at the time of project appraisal and project closure. Improved participatory forestry management can reduce long-term expenditures on poverty reduction and increase the resilience of the forests and communities' dependent on forests to natural disasters and impacts of climate change.

54.   The project was strongly supportive of the Government's policy on forestry development and climate change. The project was aligned with the Bangladesh Sixth Five Year Plan (FY11–15) with the specific tasks of conducting climate-resilient afforestation and reforestation of hill forest land, coastal areas, and plain land forest and creating the Coastal Green Belt and enhancing access to input materials, including seeds and seedlings to prevent the extent of damage by cyclones and tidal surges. It continues to be relevant

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[8] The PIU estimated that the BFD will need to invest US$1.9 million to continue the maintenance of the afforested and reforested areas in FY17.

and complements the ongoing Seventh Five Year Plan. In addition, the project supported the implementation of some of the actions identified in the BCCSAP of 2009. It proved to be forward-looking in that it became congruent to the GoB's desire to better control the impacts of climate variability in coastal and hilly areas.

55.   Overall, the PDO was consistent with the World Bank's Country Partnership Strategy (FY11–14) of July 30, 2010, which had a focus on reducing environmental degradation and vulnerability to climate change and natural disasters. The PDO is also consistent with the World Bank's current CPF 2015–2018 of March 8, 2016, for Bangladesh, which focuses on supporting a participatory approach to afforestation and reforestation which helps the poor in forest-dependent communities protect common natural resources and improve their livelihood capacity building to increase their resilience to climate change.

56.   ***Relevance of design and implementation.*** The core design of the project remains highly relevant and appropriate in the country context. The principles that guided the project design are significant for sustaining forest management interventions and they continue to contribute to arresting and reversing forest degradation and deforestation. The approach of combining afforesting and reforesting accompanied by improved forest management and participation of forest-dependent communities and aspects of participatory management, benefit sharing, and AIGAs are critical for addressing the challenges of vulnerability to climate change in Bangladesh. There were some implementation challenges because of fiduciary and safeguard performance issues but they did not significantly affect the delivery of project results, which were achieved within the original project completion date.

57.   The four project components were appropriate, with a logical chain between components, their inputs, activities, and outputs, and they were well designed and collectively contributed toward meeting the PDO. The project used proven processes, as well as new approaches to improve forest resources management and ensure that benefits were shared with forest-dependent communities. These approaches proved to be very effective in enhancing timber production, climate adaptation, and institutional capacity and in demonstrating effective and sustainable forestry resource management practices. However, the two parallel processes of beneficiary selection experienced challenges in their implementation and created some level of conflicts among the communities. The design took into account that improvement of existing forest resources management requires significant capacity building and sector reforms. The capacity building was designed with the anticipated changes in the sector reforms, especially integrating participatory approaches and climate change into forest resource management. With a short implementation period and the tie needed for the Government to approve and adopt refroms, the selection of updating and improving the National Forest Policy and FMP were adequate. The Results Framework was unable to provide a strong causal link between activities and outcomes because of poor selection of indicators. As there were constraints to make changes to the indicators because of limitations posed by the BCCRF, an effort was made, during the project implementation, to provide additional analytics in support of the achievement of the project results.

3.2 Achievement of Project Development Objectives

58.   The project achieved its PDO to reduce forest degradation and increase forest coverage through participatory planning/monitoring and contributed in building the long-term resilience of selected communities in coastal and hilly areas to climate change with substantial efficacy. All project indicator targets that were set in the PAD were either fulfilled or exceeded by project closure. Therefore, the overall achievement of the PDO is substantial.

59.   More specifically, the project achievements are described in the following paragraphs.[9] As part of the PDO, the project was to address three key objectives, including reduction in forest degradation, increase in forest cover, and contribution made in the building of the long-term resilience of selected communities in the coastal and hilly areas to climate change.

60.   **Sub-objective (a) Reduced forest degradation (Rating: High).** This was demonstrated through two results indicators: (a) key PDO indicator on the forest users trained, and (b) intermediary indicator on the number of cases of non-sustainable and illegal use of forest resources reduced by 30 percent in and around the project area through project interventions. The two indicators were fully achieved above target, with 225 percent and 190 percent, respectively.

61.   *Capacity building of forest users.[10]* The project targeted to train 15,000 forest users and by project closure 33,676 were trained. The targets on providing capacity building for women and ethnic minorities were also achieved—83 percent and 7 points above targets respectively. A total of 33,676 forest users were trained, out of which 13,710 were women and included 1,605 from ethnic minority groups. Technical training on homestead vegetable cultivation, poultry rearing, different AIGAs, leadership development, and financial management were provided to the communities. Awareness was also created among the forest users on conservation, protection of ecosystems, and climate change adaptation. There are anecdotal evidence and documentation on successful stories that demonstrated that the project was successful in strengthening forest user capacity for managing deforestation and forest degradation, anticipating potential climate change risks, and identifying adaptation measures, moving toward sustainable alternative livelihood options, as well as in transforming the attitudes of forest users on the significance of sustainable forest management. Discussions with some of the beneficiaries during the ICR mission, reports prepared by training organizations, and field verification done during trainings and interviews of some of trained forest users through the independent M&E consultant confirmed the usefulness of the types of training/awareness creation provided, the selection of forest users for the training, increased understanding on forest protection and links to climate change, and the positive behavioral changes established to a greater extent.

62.   *Reduction in forest offences.[11]* In the past, the forest-dependent communities mainly extracted fuelwood and timber, which were identified as forest offences due to the illegality and non-sustainability of such activities. It was reported that there was an average 57 percent reduction of the non-sustainable and illegal use of forest resources because of project interventions that brought about positive changes within the forest-dependent communities. This has been assessed based on the reduction of forest resources collected by the community and ranged between 54 percent and 68 percent across five districts. Such positive changes included (a) some community members refraining from harvesting forest resources to meet livelihood and income needs with the support received from AIGAs, (b) surveillance of the forests around the villages by community inspection groups, and (c) ownership of the community groups in the plantations established in the buffer zone.

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[9] All quantitative information/data are presented based on the findings of the third-party M&E studies, IUCN verification study (IUCN 2016. Boundary delineation and area measurement of proposed A & R sites through ground survey, Estimation of the survival rate and carbon (13140 ha & 1475 Seedling km for 2013-14, 2014-15 plantation year). Technical Study for Land Use Mapping, Assessment and Monitoring of Proposed Afforestation and Reforestation Sites.), the AF data, and the grantee ICR. The previous Aide memoire and ISR also reported the presence of slightly different figures in the report of the PIU, BFD, and independent reviews (owing to the precision used in measurement by the respective agencies). The details of the references used are listed under annex 9.

[10] The data sources included the grantee ICR, final aide memoire, final ISR and interviews during the ICR mission. The methodology used for data collection included reports of the respective organizations appointed for training and field varication through visit of some training sites during training and interview of some trained forest users.

[11] The final verified data source was from the PMU. The methodology used for data collection included sample household survey, data from BFD field offices including total number of recorded cases in each beat and number of recorded cases related to SF.

63.   **Sub-objective (b) Increased forest cover (Rating: Substantial).** This was demonstrated by two indicators (a) key PDO indicator on area restored and/or re/afforested and (b) the intermediary indicator on the increase in forest coverage for strip plantation.[12] Both indicators were fully achieved above target with 103 percent and 125 percent, respectively.

64.   The area reforested/afforested through participatory forestry and co-management approach in the degraded forest land, marginal, fallow, and newly accreted land in coastal and hilly areas was a key indicator to demonstrate reduction in forest degradation and increase in forest cover. The project achieved its target by establishing 17,519 ha of block plantations and 2,000 km of strip plantations in 84 forest ranges under 10 targeted forest divisions during three plantation periods (FY13–14, FY14–15 and FY 15-16). The block plantations covered 10,015 ha of a large mix of species to reduce soil erosion and increase the water retention capacity in the hills of Chittagong and Cox's Bazar, and 7,485 ha of primarily mangrove and *jhau* species to protect the coastal ecosystems and community livelihoods from storm surges, tidal swells, and cyclones. Strip plantations included 1,057 km in the marginal land along the roads, railways, and embankment slopes and 943 km of *golpata* plantations in the muddy slopes of tidal canals in the coastal belt. The establishment of block plantations was about 20 percent above the average plantations set up by the 10 forest divisions in the past. The project succeeded in developing demonstration areas of multipurpose mixed species stands mainly with native species, to form biologically diverse plantation forests. This proved to be an effective way to create a diverse forest ecosystem and generate better forest environmental functions. Allowing limited harvesting of forest products in these forests (as opposed to total protection) was pragmatic in that it provided forest-dependent communities with a stake in the benefits and an incentive to participate. Moving away from traditional monoculture plantations to multispecies plantations increased the species' richness, including the diversity of the regenerated plants within the project-supported plantations and also because of enhanced protection. This included about 26 percent and 100 percent increase, respectively, in the number of species planted in the project plantations against the control and plantations outside the project. There was also an effort to increase the density of indigenous species in the plantations where 70 out of the 77 species planted were native to the country. It was estimated that the total carbon stock of the plantations would be 49.3914 tC per ha.[13] Independent verification confirmed satisfactory quality standards of plantations established throughout the project period. The introduction of improved nursery production and seedling quality helped increase the survival rates up to 85–95 percent after two years and increased the growth rates, except for some reduction in areas affected by Cyclone Ruano.[14] Visual observations during the ICR mission site visits also confirmed this finding. Survival percentage was found within the range of 66-100 percent for project plantations and 72-99 percent for plantations outside the project during the three planting years. The project interventions significantly improved the natural regeneration with the control of grazing pressures by about 22 percent and close to a fivefold increase (494 percent) in the number of species and 16 percent and 56 percent increase in the density of seedlings against the control and plantations outside the project, respectively.

65.   With the changes to the National Forest Policy and FMP, there is high possibility that management techniques introduced by the project will be applied after project completion. The long-term benefit-sharing

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[12] The data sources included the grantee ICR, final aide memoire, final ISR and IUCN data verification report. The methodology used for data collection included survey of strip plantations in each Forest Division following multistage random sampling taking 2 Ranges from each Forest Division and 2 Beats from each selected Range. Random checking of GIS maps of re/afforested area prepared by IUCN in each Forest Division. For this, ground verification of one plantation site at each beat was done to check for planted area, location and species.

[13] Carbon stock has been calculated by assessing aboveground biomass and carbon, below-ground carbon, and soil carbon.

[14] It was reported that Cyclone Ruano caused damages to some plantations established in the Chittagong, Noakhali, Bhola, and Patuakhali Forest Divisions. Immediate remedial actions were undertaken to a larger extent within the FY16 planting season and the remaining damages were rectified using funds available for annual maintenance within the project. About 77 percent of damages were confirmed as restored and the remaining 23 percent were identified as not possible to be restored because of changed land conditions, such as erosion (hence loss of land) and high salinity conditions. The damages occurred because the cyclone happened before the benefits of the planting could be fully realized.

from forest resources in the project area were secured with agreements made between the BFD and communities. The BFD was able to secure some financial resources to continue maintenance activities of afforested/reforested areas under the project.

66.   **Sub-objective (c) Implemented participatory planning/monitoring (Rating: Substantial).** This was demonstrated through two results indicators: (a) intermediary indicator on the number of cases of non-sustainable and illegal use of forest resources reduced by 30 percent in and around the project area through project interventions, and (b) intermediary indicator on community jobs created through the afforestation/reforestation program. The two indicators were fully achieved above targets, with 190 percent, and 120 percent, respectively.

67.   ***Reduction in forest offences.*** In addition to reduction in forest offense as detailed out above, there was evidence that the new transparent and participatory planning and implementation procedures induced by the project, enabling community participation in the SF program, improved beneficiary confidence, trust, understanding, and commitment for participation in afforestation/reforestation and changed the awareness and behavior toward maintaining and protecting forests from which they will benefit.

68.   ***Community jobs and capacity building.***[15] A total of 28,465 people were selected under 836 Benefit Sharing Agreements, of which, 73 percent were signed by men and 27 percent by women. The project created community jobs of 3.61 million person-days (about 6 percent above the target) through plantation activities and building construction. The total number of person-days created by plantation activities and building construction was about 96 percent and 4 percent of the total, respectively. The number of laborers involved in both plantations (except laborers paid through contracts) and construction activities was 125,932, including 98,005 (77.82 percent) men and 27,927 (22.18 percent) women. Each laborer received BDT 300 per day. Based on a sample assessment, it was found that the annual forest-related average household income of the project beneficiaries was BDT 451,627 (44,302) against the baseline of BDT 230,949 (20,205) by project completion. Based on co-management agreements, once the timber trees assigned are harvested, 45 percent of the revenue will go to the community, 45 percent to the GoB, and 10 percent to the BFD's tree farming fund.

69.   An interview of the trained forest users indicated that 90 percent of them thought that the training benefited them. Moreover, 87 percent felt that they learned new ideas such as participatory forestry and climate change. This allowed them to understand and be part of the planning and monitoring of forest resources management. However, the adaptation methods to the impacts of climate change seemed less understood by the forest users, as only 31 percent of the trainees were able to answer the related questions.

70.   Sustaining participatory planning and monitoring requires BFD's commitment, legal mandate and financial resources in line with the update National Forest Policy and FMP, and similar or alternative implementation arrangement adopted by the project with AF, which are yet to be fully consolidated.

71.   **Sub-objective (d) Built the long-term resilience of selected communities in coastal and hilly areas to climate change (Rating: Substantial).**[16] Overall, the project benefits to the selected communities were designed with the assumption that improvement of their livelihoods and forest protection will contribute to increase their long-term resilience. The indicator on project beneficiaries and the share of female beneficiaries was achieved above the target (132 percent and 125 percent, respectively). A total of

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[15] The final verified data source was from the PMU and the AF. Data from the grantee ICR was also utilized. The methodology used for data collection included review and random checking of jobs created through re/afforestation program by BFD in 2 beats under 2 ranges of each target Forest Division and interviews of randomly selected labors.
[16] The final verified data source was from the PMU and the AF. Data from the grantee ICR was also utilized. The methodology used for data collection included review and random checking of community groups formed, selection criteria of FDG members, capacity building program and small grant funding by the AF.

60,587 people benefited, with 37.47 percent of them being female beneficiaries. This included beneficiaries whose income increased by at least 30 percent because of project interventions—that is, 88 percent of the targeted 6,000 households under the AIGAs, 34,00 beneficiaries of value-chain development, and 187 local service providers (LSPs). These figures do not include people who received wage earnings because of the project.

72.   More specifically, the indicator on increased household income of beneficiaries participating in AIGAs was achieved above the target (126 percent). The annual income of the project beneficiaries was BDT 112,499 based on a sample assessment against a baseline of BDT 84,788. Comparative to the baseline and control, people involved in farming reduced by about 8.6 percent and 6.5 percent, respectively, while an increasing trend was observed in moving toward the service sector and businesses.

73.   A total of 6,000 selected households (out of which 86 percent was females) in 200 targeted villages were organized for expanding the value-added economic activities.[17] Specifically, the poultry value chain was expanded across all 200 villages with training on improved backyard poultry rearing practices and establishment of a market shed. A total of 187 LSPs were trained and provided with the necessary equipment and vaccines. The LPSs were earning an income of BDT 5,500–22,000 per month at the time of project closure.[18] Positive responses were received from communities during the ICR mission, where they indicated satisfaction in selecting local young entrepreneurs to be developed as LSPs. In addition, the value chain improvement program on beef, cattle, and milch cow was piloted in 10 villages and fish farming in 3 villages. The project also provided all the selected households with improved cooking stoves (ICS) which reduced fuelwood consumption (and therefore the cost associated with purchasing fuelwood),[19] sanitary latrines to help maintain the sanitary conditions, and tube wells in groups which helped access safe drinking water. The reduction in fuelwood consumption, in particular, would have contributed to the successful survival of the reforested and afforested sites and reduced the pressure on other non-project forest areas.

74.   The project supported the setting up of the federation-managed income-generating activities based on the MRSLF to raise funds for their organizational activities, enhancement of productive use of their funds, and generating of group income for all members and for community-level activities. Nearly 86 percent of the membership of FDGs were women, including 321 households who were from ethnic minority communities. At project closure, these groups had raised BDT 13,224,016 in their revolving funds. A total of 7,274 loans worth BDT 95,181,000 were given to the group members covering non-forest AIGAs. This also included 1,726 second loans to those households that repaid their first loan back to the revolving fund. The loan repayment rate, on average, was 99 percent. There was anecdotal evidence, based on discussions with beneficiaries, of an increase between 100 percent and 300 percent of their monthly average income with this ability to access the necessary financing.

75.   Overall, (a) 88 percent of the households increased their income by at least 30 percent, (b) the average income of 6,000 households increased by 51 percent, (c) the savings of 96 percent of the households increased by 50 percent, and (d) 70 percent of the households increased their asset value by 50 percent. In addition, there were anecdotal evidence based on interviews done that community members of the project areas were able to recover post-Cyclone Ruano with minimum external support.

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[17] This included provision of improved vegetable seeds, fruit and timber saplings, improved poultry, fishing and livestock maintenance, scaling up of value-chain interventions, demonstration of climate-resilient and improved technologies, promotion of ICS and water and sanitary support (deep and shallow tube wells and sanitary latrines).
[18] Data presented here is what is reported in the grantee ICR report. However, AF reported during the World Bank ICR Report review by the Grantee that according to their survey, the income was at a range of BDT 5,500 – 26,500 per month.
[19] The project impact and baseline survey data indicate that irrespective of the beneficiary type or forest zone, overall the money spent on fuelwood was reduced by about 52 percent (that is, from a baseline of BDT 5,642 to BDT 2,716 annually). It was assessed that the change in consumption was significant mostly in the hill forest zone by the FDG members, where money spent was reduced by 75 percent.

76.   **Other achievements.** Overall, the project demonstrated both ecological and socioeconomic resilience to climate change and addressed both policy and capacity-building needs in the forestry sector. The project innovated various tools and systemic interventions that have emerged as good practices. This specifically included new forest planation management practices, reforms in forest policy, and capacity building of the BFD and MoEF staff, including improvements made to the BFD's field facilities, as well as a forestry resource inventory and a revised FMP developed to achieve a programmatic approach for forest and livelihoods in Bangladesh, as described in the following paragraphs.

77.   *Forest diversification.* The reforestation and afforestation were undertaken for multiple benefits. The mangrove, enrichment, and core zone block plantations were designated for critical functions, including ecological protection and biodiversity conservation. All other plantation sites were planned and established for benefit sharing with forest-dependent communities according to the Social Forestry Regulation and transparent and participatory process defined in the project implementation manual. This also included setting up nine-member SF committees that were involved in beneficiary selection and to ensure monitoring of forestry activities. The M&E studies confirmed that diversification of plantations to balance (a) the forest ecosystem resilience by diversifying the spatial distribution of different types of plantings on the landscapes and reintroducing indigenous and naturalized plantation species for climate resilience and (b) short, medium, and long rotation wood and non-timber forest species, including fruit trees, toward building socioeconomic and livelihood resilience were successful.

78.   *Reforms in forest policy.*[20] The indicator on reforms in forest policy, legislation, or other regulations supported was achieved by the project. As planned during the project design, this indicator was primarily focused on reforming the existing National Forest Policy of 1994. While a forward-looking policy that included people-oriented forestry was already present in Bangladesh, it still needed to address current and emerging challenges, such as threatened biodiversity, sustainable management of forest resources for ecosystem services and community well-being, and climate change. Following extensive consultations at the local, regional, and national levels, the National Forest Policy of 2016, covering up to 2035, was drafted in English and Bengali and was submitted to the MoEF for approval. It brought in key principles, such as on sustainable forest ecosystems with co-benefits of biodiversity conservation, climate change, and community well-being; integrated forest management with improved forest governance and technology; innovative forest management based on applied research and field evidences; gainful conservation partnerships with communities and private sector based on social equity and gender equality; and strengthened political and civil society commitment, collaboration, and enforcement of forest and wildlife protection. The new policy also places emphasis on increasing tree cover all over the country, climate resilience, and involvement of communities and other stakeholders in managing forest resources. Overall, the changes made to the policy would ensure that the GoB will be able contribute to the PDO beyond the life of the project.

79.   *Capacity building of Government institutions.*[21] Capacity-building activities were provided to the BFD and MoEF, including training activities and supporting the improvement of planning, assessing forest resources, and monitoring. A total of 25 training programs, 26 exposure visits, and 5 overseas certificate programs (including 51 short two-day trainings and 5 full-time postgraduate programs) were provided to 51 BFD and 5 MoEF officers. In addition, as part of the administrative training program, training was provided to 380 BFD staff at the Forest Academy and 464 staff at the local and field levels. Overall, the training focused on a number of important topics relevant for the achievement of the project objective.[22]

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[20] The data sources were from the PMU, aide memoire and review of the draft policy. This also included review of the process utilized in the updating of the policy.
[21] The data sources were from the PMU, the grantee ICR and interviews during ICR mission. Methodology used for data collection included review of training information from the PMU and interviews.
[22] The training topics included the use of GPS and GIS/MIS, climate change with special focus on adaptation, carbon sequestration, SF, participatory forestry, co-management and community mobilization, biodiversity conservation, management

Evaluations and interviews conducted by an independent group found that, on a scale of 0 to 5, the knowledge level of the staff increased by 1 to 2 points and satisfaction on the training provided was mixed. Interviews of some trainees indicated that the training materials were rich but were too extensive for the limited training period. Some trainees also had challenges understanding the use of Global Positioning System (GPS) and GIS/management information system (MIS) and indicated that follow-on training would be useful to make the training effective and beneficial. Interviews of the trained BFD staff indicated that perception on Reducing Emissions from Deforestation and Forest Degradation plus (REDD+) had increased to 60 percent with awareness on deforestation and climate change. Knowledge on planting suitable species in newly accreted land of the coastal area was clear to only 60 percent of the trainees. Most of the participants had the knowledge that quality seeds were important for the plantation program and that small seeds should not be sown directly in polybags. All the participants understood the importance of involving local community needs in the participatory afforestation and reforestation program. However, the knowledge on the importance of conserving indigenous species and the impacts of planting high yielding exotics was not clear.

80.   The project supported the BFD to develop land use and land cover maps for the project areas and guidelines and methodologies on estimating and monitoring of biomass and carbon, allometric equations for tree species, and periodic monitoring of the survival rates and biomass growth rates. The BFD staff were also trained on forest biomass and carbon stock assessment. The BFD officers agreed that this technical support and related training would allow them to better manage their forest resources both in extent and quality. The technical support provided to strengthen the capacity and capability of the Resource Information Management System (RIMS) of the BFD by incorporating best practices in forest resource information management and introducing new technologies, approaches, and tools into the Forest Resource Monitoring and Assessment Protocol, as well as training, were successful. To support the abovementioned soft interventions, the related information communication technology software and equipment were provided. In addition to its ability to undertake training in GIS/MIS database management and carrying out forest inventory and socioeconomic surveys, the RIMS Unit now possesses the capability to process satellite images and undertake geospatial analysis, mapping, and reporting.

81.   The FMP, which is the long-term planning document for the BFD to achieve its goals on sustainable forest management, was updated. The updated FMP, that covers 2016–2036, places emphasis on the current and emerging forestry issues in line with the National Forestry Policy of 2016. The FMP was validated through consultations with all stakeholders. Specifically, it proposes to (a) bring 20 percent of land area under forest and tree cover with a minimum canopy density of 50 percent; (b) conserve the remaining natural *sal*, hill, and mangrove forests and prevent further deforestation and degradation; (c) strengthen the conservation of wildlife and biodiversity; (d) create a strong coastal shelterbelt of climate-resilient plantations on newly accreted char lands and other unused public lands; (e) improve the socioeconomic conditions of the forest-dependent communities; (f) develop forest product industries and occupations to generate income; (g) strengthen applied forestry research, including current and emerging issues, so that informed interventions can be planned and implemented; and (h) strengthen the forestry sector institutions to enable them to deliver on the sustainable forest management, which addresses some of the shortcomings of the previous FMP of 1994. These goals are backed by a well-planned strategic program. It identifies the manpower needs to deliver the FMP effectively.

82.   To ensure improved working conditions for the BFD field staff, which would be necessary to ensure improved management of forest plantations in the long term, the project supported the rehabilitation and reconstruction of 76 camp and field offices. Many of the original field/camp offices were found to be in an extremely dilapidated state because no resources were allocated in the past to maintain and rehabilitate

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development, managerial capacities and skills, forest law, policy and regulations, landscape and forest restoration, silviculture, REDD+, carbon emission, and so on.

where needed. The rehabilitation and reconstruction work ensured little or no residual impact to the environment and also ensured that the designed structures, particularly in cyclone-prone areas, were resilient to provide adequate protection during extreme events. There were overall positive responses from all camp and field offices visited during the ICR mission on the improvements made by the project to the workplaces of the field staff, indicating an increased incentive to undertake their responsibilities more effectively.

3.3 Efficiency

83.   The project closed in time, disbursed 96.7 percent of the grant (see annex 1), and the impacts described earlier and all relevant outputs listed in annex 2 were attained with high efficiency. An ex post cost-benefit analysis (CBA) was carried out and it confirmed the positive economic impact and economic feasibility of the project (see annex 3 for details).

84.   The integrated CBA of the project's Components 1 and 2 showed an internal rate of return (IRR) of 17 percent. When Component 3 was also integrated in the analysis, the economic IRR is reduced to 13 percent. Both these IRRs were above the figures derived at the time of project appraisal.[23] This still was a very conservative measure, as it may not capture all the project benefits (for example, monetization of strengthened institutional capacity for monitoring and so on). To account for the possible benefits of reduced exposure to climate events, the analysis covered a 30-year time horizon. The analysis tried to capture a wide range of benefits, including tangible goods (that is, timber and non-timber forest products) to services provided on the coast (that is, averted life and house damages from storm surges) and in the hilly areas (that is, protection against landslides). The CBA included both direct costs (that is, afforestation, rehabilitation field offices, monitoring, and AIGAs) and indirect costs (that is, opportunity cost of land). A sensitivity analysis showed how the IRR changes depending on the deforestation rate.

85.   The analysis also found a financial IRR of 41 percent against the appraisal value of 36 percent, above the IRR estimated at appraisal. This value demonstrated the financial viability of the project, which will depend ultimately on the ability of the BFD and the beneficiaries from the forest plantations to maintain the forests beyond the project's implementation period. It is also worth noting that the financial viability depended on the ability to provide co-benefits (that is, through AIGAs grants) that would reduce pressure on forests, as seen in other parts of this evaluation (refer to annex 3 for details on the Economic and Financial Analysis).

3.4 Justification of Overall Outcome Rating

Rating: Satisfactory

86.   The overall outcome is rated Satisfactory on account of the (a) high relevance of the project objectives, (b) substantial relevance of the design, (c) achievement of the PDO with substantial efficacy, and (d) high efficiency. The project outcomes are consistent with Bangladesh's short- to medium-term development planning as well as the World Bank's CAS/CPF. The relevance of the project outcomes and benefits to communities were confirmed by the high positive responses from the beneficiaries interviewed during the ICR mission. Many design elements were relevant under the local context, particularly within the capacity level at which the project was implemented. There were some challenges in reporting on the achievement of the project outcomes because of weakness in the design of the Results Framework. However, the project results indicators were fully achieved or exceeded the target. The PDO was achieved despite some operational challenges in the first half of project implementation. This included highly satisfactory

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[23] At appraisal, the combined IRR expected from Components 1 and 2 was 15 percent and once Component 3 was also added to the calculation the IRR was 12 percent.

achievement of sub-objectives (a) reduced forest degradation, (b) increased forest cover, and (d) built the long-term resilience of selected communities in coastal and hilly areas to climate change, and satisfactory achievement of sub-objective (c) implemented participatory planning/monitoring. Implementation of the project activities was financially sound, with most of the project grant disbursed. The project closed on time. The project's positive economic impact is a testament to the benefits of participatory afforestation and reforestation to improve forest management and adapt to climate change impacts.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

87.   The project generated additional income in targeted communities while safeguarding forest resources especially set aside for conservation from further degradation and reducing deforestation. Most of the investments were concentrated in areas of high poverty largely because forest-dependent communities were found to be located in such areas. Beneficiary sharing from forest resources mainly focused on forest-dependent households, while AIGAs focused on the bottom 10 percent of poor found within the 10 targeted forest divisions.

88.   The project created social resilience to withstand disaster impacts. For example, during Cyclone Ruano, many of the community members were able to recover from the impacts of the cyclone on their own using their knowledge and with little external financial and technical support. Having access to the MRSLF, established by the project, provided the financial support needed to rebuild their assets and livelihoods. Short-term labor opportunities also provided some level of ease to move forward the lives of 93,391 people who received wage earnings from the project. The beneficiaries were able to increase their asset values by 95 percent from the situation before the project, covering land, including homesteads, poultry, livestock, marketable trees, furniture, vehicles, equipment, fisheries, and savings. Around 88 percent of the targeted 6,000 households were able to increase their household income by at least 30 percent through AIGAs. A total of 5,160 women benefited from AIGAs, which accounted for 86 percent of the beneficiaries. Unlike the male members of the households who often work outside the village, the female beneficiaries were readily available to take up household-based AIGA allowing them to continue their traditional household responsibilities, while generating income. The FDG members managed to establish BDT 15.26 million participatory savings and the MRSLF totaling BDT 81.0 million.

89.   The project has introduced a far-reaching culture change whereby the importance of community engagement was demonstrated and communities have become partners in forest resource management. In addition, the intensive training programs provided the communities forest management and livelihood skills. A total of 6,000 forest users were trained, which included 5,160 women and 321 ethnic minority community members.

90.   These interventions contributed to poverty alleviation by providing income through employment, livelihood development, and enabling the FDGs to engage in forestry co-management. Organizing the community members into community groups such as the FDGs built social cohesion in villages and helped develop community trust and confidence. However, the project could only cover the bottom 10 percent in poverty.

91.   The project has demonstrated that technically viable models exist, and that partnerships with villagers, whereby the FDGs enjoy limited harvesting rights to forest produce, is a feasible approach to restoring ecological balance in critical forest ecosystems. This approach, combined with further incentives to be engaged in the long term, has considerable potential to be scaled up and replicated elsewhere in Bangladesh.

(b) Institutional Change/Strengthening

92.   The project attained considerable results in relation to institutional change and strengthening because they were the core elements of the project design The well-targeted and designed institutional development activities such as updating of the National Forest Policy and FMP that would guide the sustainable forest resources management in Bangladesh, taking current and emerging issues into consideration, provided the direction for long-term institutional change of the BFD. Developing and capacitating the RIMS Unit in the BFD with modern technology would allow the country to monitor its forest resources and ensure protection and sustainable use efficiently and effectively where needed. Training of the BFD and MoEF officials has increased their knowledge to better manage the forest resources.

(c) Other Unintended Outcomes and Impacts (positive or negative)

93.   The mapping of the potential green belt within the coastal zone of Bangladesh was not part of the original design of the project but was introduced during the MTR as a request from the Government. This tool was instrumental in opening the dialogue within the GoB on investing in a green belt which would respond effectively to disaster and climate risks. It is expected that once the green zone is established, it would provide protection from cyclones and storm surges by reducing wave height, energy, and wind velocity; enhance accretion by trapping sediments and reducing erosion; help sequester 100 metric tons of carbon dioxide per ha per year; provide forest-based resources to the communities; and sustain local ecosystems.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

94.   Not applicable.

4. Assessment of Risk to Development Outcome

Rating: Moderate

95.   The project successfully implemented a comprehensive program of afforestation and reforestation, which has proven to be effective in promoting sustainable forest management while contributing toward reducing climate and disaster vulnerabilities and improving community livelihoods. The risks foreseen in maintaining the achievement of the development outcome are (a) reduced engagement of forest-dependent communities to assist the BFD in maintaining and monitoring the forest plantations established by the project, because of loss of immediate income through wages and (b) that climate change might increase the incidence of cyclones, which could reduce plantation yields, particularly in the coastal areas. The BFD has already received some resources from the revenue budget to mitigate the first risk but it is only 5 percent of the funding need identified by the BFD. The AF has committed to support livelihood activities of the communities through their own resources for some time. The establishment of forest plantations as a green belt is expected to provide protection to the plantations established behind the green belt. Many of the well-established plantations under the project, as well as old plantations in the project areas, had relatively little damage because of Cyclone Ruano. This confirms that the green belt will provide the necessary protection for future cyclone events.

96.   The risk of reversing or losing the institutional and community capacity for anticipating and managing forest degradation and deforestation, as well as climate impact, is considered Moderate. The project design succeeded in instilling some sense of ownership in forest-dependent communities and local BFD officers which is critical for sustaining the development outcome. New approaches were adopted for planning, surveying, and geo-referenced mapping of plantation activities; adopting improved nursery planning and practices to produce improved seedlings; matching species with micro-characteristics of the

plantation sites; augmenting transparency for community beneficiaries; and setting up conflict resolution mechanisms. The capacity building of communities and the BFD needs to be consolidated. It was reported that the divisional forest officers felt that in the future, greater emphasis should be placed on capacity building in the field and at the community level in nursery management and all aspects of silviculture from micro-site selection, site preparation, planting, and maintenance, particularly as climate resilience afforestation/reforestation is a new science. Therefore, some additional support may be needed to keep up the momentum until the new project is effective. Some conflicts because of two methodologies used for beneficiary selection by BFD and AF was highlighted during the interactions with some of the communities during the ICR mission. Future interventions should utilize one methodology, put into consultations with the community and disclosed adequately to avoid possible risks due to such issues.

5. Assessment of Bank and Grantee Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Moderately Satisfactory

97.   During preparation and appraisal, the World Bank team considered the adequacy of project design and all its major aspects—technical, financial, economic, and institutional—as well as procurement, financial management, and safeguards. The PDO and design of the project were appropriate and realistic. The lessons learned from previous projects were incorporated. The results framework including design of indicators and M&E capacity was inadequate. Some improvements to the design of the M&E system would have helped consolidate the results better. There was a delay in getting the project effective due to challenges faced in reconciling the BCCRF operating guidelines and the Government's standards processes, which should have been foreseen by the World Bank team in time to avoid the delays.

98.   Project preparation was carried out with a sufficient number of specialists who provided the technical skill mix necessary to address sector issues and develop the project design. The World Bank provided adequate resources—staff time and funding—to ensure the quality of preparation and appraisal. The team recognized the importance of consistency with the CAS and Government priorities in the sector. The World Bank maintained a consistently good working relationship with the grantee and its institutions during preparation and appraisal.

(b) Quality of Supervision

Rating: Satisfactory

99.   The supervision skill mix was appropriate for a project of this nature because it included technical, environmental, social development, procurement, and financial management specialists. A total of 7 supervision missions were undertaken by the World Bank task team. The supervision missions paid attention to reviewing compliance with project design and World Bank safeguards and fiduciary requirements ensuring addressing of issues on time, although some issues such as procurement issues and social safeguard compliance took a longer time to resolve. The supervision team provided adequate direction to the client toward the achievement of the PDO. Due to restrictions of the BCCRF, the World Bank team decided to keep the results indicators unchanged but made the decision to proactively capture additional data to support the project achievement. Sufficient budget and staff resources were made available for supervision. The task team alerted the MoEF and BFD about issues that emerged during implementation and facilitated prompt corrective action. The ISR ratings on achievement of the PDO and implementation progress were realistic. Excellent assessment was made of the status of project

implementation and realistic recommendations were provided to the grantee. The grantee acknowledged the quality of the overall implementation support provided by the task team and the extent of the World Bank support toward meeting the project objectives.

(c) Justification of Rating for Overall Bank Performance

Rating: Satisfactory

100.   The World Bank team brought value addition to the project design, and the achievement of the PDO confirms that it was realistic and achievable. The World Bank's supervision focused on all relevant aspects to assess progress and the realization of objectives. Supervision was also timely, with the necessary corrective measures identified and followed up on. In view of the Moderately Satisfactory rating for quality at entry and Satisfactory rating for supervision, the overall World Bank's performance is rated Satisfactory.

5.2 Grantee Performance
(a) Government Performance

Rating: Satisfactory

101.   The GoB (including the MoEF) demonstrated strong ownership of the project and provided effective leadership in project implementation. Firm commitments and strong support to the project were reflected in the Government's contribution through counterpart funding. The GoB responded positively to resolve issues as and when they arose. The GoB officials worked closely and regularly with the World Bank's team. The MoEF played an active role in project implementation by providing policy guidance to the BFD/PIU and the AF through the Project Steering Committee set up by the project. The GoB responded to the project principles and requirements such as consultation and involvement of stakeholders and beneficiaries, ensuring readiness for implementation by setting up of the PIU on time with most of the key staff in place, making an effort, in many situations, to resolve implementation issues on time and ensuring that the overall fiduciary aspects were in compliance throughout the project.

(b) Implementing Agency or Agencies Performance

Rating: Satisfactory

102.   The BFD set up an effective PIU to manage the interventions under Components 1, 3, and 4. The PIU also provided the necessary support for financial management, procurement, safeguards, and communication to the AF to undertake the Component 2. Although there was a delay in recruiting suitable procurement expertise, overall the PIU was equipped with skilled, dedicated staff who proved to be open-minded and hardworking. There were some weaknesses in managing safeguards in the initial stage of the project and most were corrected during the latter part of project implementation. Appropriate levels of review and approval were in place and the review processes were timely. Financial accountability and follow-up were observed, expenditures were duly authorized before they were incurred, and documentation was maintained properly for periodic review. The recommendations of the MTR were implemented and led to improved project performance, as well as achievement of the PDO. In addition, the staff of the field offices of the 10 targeted forest divisions played a key role in ensuring successful implementation of the project.

103.   The AF and its partner agencies effectively managed the project Component 2 and were responsible for ensuring that the indicator targets were achieved above the targets. It provided the adequate number of qualified and experienced staff to coordinate and support the activities under Component 2. The AF had a

very good field presence and showed commitment to continue its support to the communities targeted by the project beyond the project implementation period.

104.   The PIU and the AF regularly monitored the Results Framework and updated and shared the results monitoring matrix with the World Bank. They conducted regular monitoring visits to the project sites, involved independent reviews, and documented the achievements well. All the required reports were submitted on time. The reports provided valuable feedback on the project's progress and served as useful inputs to the World Bank's supervision missions.

(c) Justification of Rating for Overall Grantee Performance

Rating: Satisfactory

105.   The grantee performance is rated Satisfactory because of the strong commitment shown by the GoB and MoEF and the dedication demonstrated by implementing agencies, all of which contributed to the achievement of the PDO. It was especially successful in demonstrating sustainable forestry management approaches and showed determination in overcoming the difficulties caused by inclement weather. With Satisfactory ratings for Government performance and implementing agency performance, the overall grantee performance is rated Satisfactory.

6. Lessons Learned

106.   ***Forest resources management projects should be designed for implementation over a longer period or should have a confirmed commitment with adequate resources at the time of project planning to ensure maintenance of plantations beyond the project implementation period.*** While the project was successful in achieving its objective, there is some risk associated with the maintenance of plantations until additional resources are in place (as allocation from revenue budget could always be unpredictable). Often it takes more time than anticipated to obtain the required Government budget allocation to sustain project investments. The project's duration is also critical to keep forest-dependent communities engaged, change their attitudes, and build the ownership in the management of forest resources. Benefits need to be realized particularly from forestry activities (which is not possible even in a five-year project, as there is no five-year short-rotation plantation possible) to a greater extent during the project lifetime to substantially reduce the need to continue with the short-term incentives.

107.   ***Providing short-term livelihood incentives to communities facilitates the effective adoption of forest resources management practices.*** The project demonstrated that while some of the benefits (such as timber extraction, protection from disaster/climate risks, and so on) are long term, providing short-term livelihood incentives raises the willingness of communities to participate and eases the burden on the most vulnerable groups. Training and awareness raising and developing clear links to livelihood outcomes enable community understanding of the significance of the project interventions. Close and continued interaction with the communities for a considerable amount of time helps change their attitudes and behaviors toward sustainable forest resources management with long-term benefits.

108.   ***Building appropriate mechanisms to promote community participation in forest resources management and supporting the enhancement of alternative livelihoods and win-win relationship between the BFD and surrounding community are crucial for their sustainability.*** The BFD was responsible for setting up the committees for identifying beneficiaries and agreeing on the benefit-sharing mechanism from forest plantations. In parallel, the AF supported the organization of community groups, conducting community conservation education and public awareness, community skills enhancement/training programs, and programs to build capacities of the households to explore livelihood alternatives. While the two processes allowed outreach toward a larger number of people, the beneficiaries

(who were not among the poorest and did not get livelihood improvement benefits) failed to see the links and the values and were conflicted with the beneficiary selection (targeting the poorest among the villagers who are also poor) arrangement to some extent. Future projects should assess, in detail, the benefit of both processes and develop one process to be adopted across all institutions to reduce potential conflicts and will therefore require larger resources. As the project was focused on forest resources management, beneficiaries receiving AIGAs should also be involved in participatory forest management (so that the benefits during the project could be supplemented by benefits beyond the project period) and vice versa (so that the people outside the 'poorest' group do not feel deprived of near-term benefits and receive entitlements for longer-term benefits only). This would also reduce possible conflicts arising during beneficiary selection. While the BFD's inadequate capacity to undertake community mobilization and the value of having the services of an organization such as the AF are well noted, unless the BFD plays a much more pivotal role in engaging with the community (which is also captured in the updated National Forestry Policy and FMP), once the external resources are phase out, community participation in forest management is not likely to be sustained.

109.   ***Forest sector investments bring about both climate change mitigation and adaptation benefits.*** The project managed to provide climate mitigation benefits by reforestation/afforestation activities because of carbon stock created, reducing net greenhouse gas emissions into the atmosphere. At the same time, well-managed forests have the ability to provide an adaptive mechanism from climate variability induced events such as cyclones, as demonstrated by the project. With more integrated and diverse forest management practices being introduced, communities' dependent on the forests have the opportunity to derive both tangible and intangible adaptive benefits.

7. Comments on Issues Raised by Grantee/Implementing Agencies/Donors

(a) Grantee/Implementing agencies

110.   The Grantee's and implementing agencies' comments were shared by MoEF on June 21, 2017, acknowledging World Bank's ICR assessment and ratings. Comments were provided to correct some of the updated data/information utilized in the report that were derived from the Grantee's ICR. Detailed comments received are included in annex 7.

(b) Cofinanciers/Donors

111.   Not applicable.

(c) Other partners and stakeholders

112.   Not applicable.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in US$, Million equivalent)

Components	Appraisal Estimate (US$, millions)	Actual (US$, millions)	Percentage of Appraisal
Component 1: Afforestation and Reforestation Program	20.90	21.26	102
Component 2: Alternative Livelihoods to Support Forest Communities	3.80	5.00	132
Component 3: Capacity Development for Forest Resource Planning and Management	5.23	5.77	110
Component 4: Project Management	3.37	2.97	88
Total Baseline Cost	33.30	35.00	105
Physical Contingencies	0.00	0.00	
Price Contingencies	1.70	0.00	
Total Project Costs	35.00	35.00	
Project Preparation Costs	0.00	0.00	
Total Financing Required	35.00	35.00	

Note: The current disbursement is US$32.68 million (96.4 percent of total financing required).

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (US$, millions)	Actual (US$, millions)	Percentage of Appraisal
Grantee	-	1.20	1.20	100
Bangladesh Multi-Donor Trust Fund for Climate Change	-	33.30	35.00	105

Note: The AF's financial contribution was not captured on both tables above, as it was not integrated into the disbursement profile. The AF contribution was US$0.19 million at both appraisal and actuals.

Annex 2. Outputs by Component

Component 1: Afforestation and Reforestation Program

(i)   Participatory afforestation and reforestation

- *Areas re/afforested.* The BDF established 17,500 ha block plantations (10,199 ha in the hills of Chittagong and Cox's Bazar forest divisions and 7,301 ha in the coastal forest divisions) and 2,000 km strip plantations (1,057 km in the marginal lands of roads, railways and embankment slopes, and 943 km *golpata* plantations in the muddy slopes of tidal cannels of coastal belts) from July 2013 to June 2016, covering 10 forest divisions. This involved 84 forest ranges and SF nursing and training centers and 204 forest beats, SF plantation centers, and forest camps and nurseries of Upazilas.

- *Biodiversity improved.* Short-rotation plantations constituted more than 70 percent exotic species (mainly Akashmoni) and long-rotation plantation constituted 100 percent indigenous species in the hill forest zone. In the coastal forest zone, mangrove plantations constituted 100 percent indigenous species, including Keora (*Sonneratia apetala*), Baen (*Avicennia officinalis*), Gewa (*Excoecaria agallocha*), and so on, and strip and non-mangrove plantations constituted only 20 percent indigenous species and the rest 80 percent are exotic species (for example, Akashmoni). In the SF zone, both indigenous (30–40 percent) and exotic species (27-44 percent, mainly Akashmoni) were planted. The increase of share of native plants increases the climate resilience of the forest ecosystem and reduces the ability of exotic plants, such as *Acacia* sp. to invade further. A total of 77 plant species were planted in all the forest zones, with a maximum of 49 plant species each in both hill forest and coastal forest zones.

- *Seedling density improved.* The seedling density of exotic species in the plantations was successfully reduced to 860 stems per ha across the project area compared to areas outside of the project (1,416 stems per ha). The seedling density of exotic plants varied widely with the planation types. The mangrove, core, *jhau*, *golpata,* and enrichment plantations were almost entirely composed of indigenous species. The seedling density of exotic plant species was the highest (1,440 seedlings per ha) in strip plantations followed by buffer zone (1,317 seedlings per ha), non-mangrove plantations (792 seedlings per hectare), and mound plantation (480 seedlings per ha). The plantation of exotic species was justified by the field forest officials, citing that the project participants demanded some exotics, especially the fast-growing *Acacia auriculiformis.*

- *Planted seedlings survived.* The survival percentage was found to be within the range of 66–100 percent with an average of 85–95 percent. Only one non-mangrove plantation had a lower survival percentage due to the damage by navigation and Cyclone Ruano.

- *Carbon stock established.* The integrated carbon stock assessed using data for aboveground, below-ground, and soil carbon of the plantations was 49.3914 tC per ha. The soil carbon stock in the coastal forest zone was higher than that of the hill forest and social forest zones, which resulted in higher carbon stock in the plantations of the four forest divisions in the coastal forest zone for all categories of interventions.

- *Community jobs created by plantation activities.* The project created community jobs of 3.6 million person-days through plantation activities and building construction. The total number of person-days created by plantation activities and building construction was 3,239,886 (96.03 percent of total) and 133,910 (3.97 percent of total), respectively. The communities involved in plantation activities were categorized as directly paid plantation laborers, directly paid plantation watchers, and laborers paid through contracts. The directly paid plantation laborers, directly paid plantation watchers, and laborers paid through contracts were 2,560,688, 395,013, and 284,185, respectively. The BFD created a database

with details of the laborers who worked in the re/afforestation activities (seedling raising in the nursery, seedling carrying, plantation site preparation, planting seedling, weeding, vacancy filling, and watching the plantation). The number of laborers involved in both plantations (except laborers paid through contracts) and construction activities was 125,932, including 98,005 (77.82 percent) men and 27,927 (22.18 percent) women. Each laborer received BDT 300 per person-day.

(ii)   ***Rehabilitation/reconstruction of Forest Department Field Infrastructure***

- *BFD infrastructure completed.* A total of 76 priority BFD field office (camps/beats) sites located in 9 administrative districts in the coastal areas and under 10 forest divisions were rehabilitated/ reconstructed.

Component 2: Alternative Livelihoods to Support Forest Communities

- *Communities organized.* As targeted, 200 community-based groups, named FDGs, were formed with 6,000 beneficiaries in project areas. The mobilization and formation of the community demonstrated that alternative livelihood options not only conserve the newly planted areas but also help reduce the dependency on forest resources. In addition, the following outputs were completed: (a) training the FDG members on different AIGAs; (b) forming and strengthening 55 Union Federations; (c) training federation leaders in financial and management functions; (d) establishing 55 MRSLFs at the union federation level with a monthly saving of BDT 100 by each FDG member; (e) providing improved vegetables seeds, fruit and timber saplings, and poultry (chicken/duck); (f) scaling up value-chain interventions; (g) demonstrating climate resilient and improved technologies; and (h) promoting ICS and water and sanitary support (deep and shallow tube wells and sanitary latrines) and so on. Table 2.1 provides the summary of the achievements.

Table 2.1. Summary of the Achievements Under the Alternative Livelihood Support Activities

	Activities	**Unit of Measure**	**Baseline**	**Target**	**Achievements**
1	Selection of FDG villages	Number	200	200	One-time selection
2	Selection of sample households	Number	6,000	6,000	5,160 (86%) female; 840 (14%) male
3	Selection of female-headed sample households	Number	-	1634	27.23% of total
4	Selection of ethnic minority/indigenous households	Number	-	321	5.35% of total
5	Forest users trained	Number	6,000	6,000	Technical training on homestead vegetable cultivation, poultry rearing, and different AIGA
			-	916	Basic and refresher on leadership development and financial management
6	Forest users trained - Female (sub-indicator)	Number	3,000	5,160	Technical training on homestead vegetable cultivation and poultry rearing
			-	2,045	Training on AIGA based on their business plan
			-	625	Basic and refresher on leadership development and financial management

	Activities	Unit of Measure	Baseline	Target	Achievements
7	Forest users trained - Ethnic minority/indigenous people (sub-indicator)	Number	321	321	Target achieved
8	Training of project staff	Number	-	56	Training on (a) Participatory Rural Assessment, (b) integrated farming system, and (c) value chain and entrepreneurship development
9	Foreign training of project staff	Number	-	42	
10	Formation of Union Federation	Number	55	55	Target achieved
11	Formation of UCF	Number	55	55	Target achieved
12	Awareness campaign	Number	55	55	Target achieved
13	Exchange visit	Number		65	
14	Communication materials development, publication, and dissemination	Number	-	15	Billboard, poster, brochure, handbook, leaflet, video, and so on
15	Distribution of poultry	Number of FDG members	-	6,000	21,000 chickens/ducks were distributed
16	Distribution of fruit and timber tree saplings	Number of Saplings		207,000	119,000 grafted saplings of quick-growing fruit trees (14 spp.) and 88,000 saplings of timber trees (11 spp.)
17	Distribution of vegetable seeds	Weight (Ton)		6.5	Seeds of 16 types of vegetables
18	Selection of value chains for value-adding economic activities	Number		9	Through systematic value chain selection procedure, 'Patipata' and bamboo handicrafts, poultry and pond fish and poultry and handicraft (cap making) for the southern region have been selected.
19	Distribution of ICS	Number of FDGs		6,000	From IDCOL supported by the World Bank
20	Participatory savings by FDG members	BDT		15,261,000	Mostly depositing at BDT 100 per month
21	MRSLF	BDT million		81.0	BDT 13.2 million from savings, BDT 60 million from project grant, and BDT 4.3 million from interest income
22	Distribution of MRSLF	BDT		109,080,000	92% FDG members received the MRSLF once. Around 2,144 participants received the MRSLF for the second time. The loan size ranged from BDT 5,000 to 25,000 for 12 months at 5-10 percent interest/service charge.
23		Number		7,928	

	Activities	Unit of Measure	Baseline	Target	Achievements
	Links with government and other service providers	Number		535	Link with the Department of Agriculture Extension, Department of Fisheries, Department of Livestock Services, Renata, Nourish, Pebble Child, and so on
24	Formation of Community Patrol Group (CPG)	Number	21	21	Target achieved
25	Inclusion as SF beneficiary from Component 2	Number		1,751	29% FDG members have been included in the SF program by the BFD.
26	Inclusion of labor in plantation work	Number		3,083	42.1% FDG members were involved as laborers in the plantation activities by the BFD.
27	Development of LSP of Value Chain Approach			92	Started from year 2 of the project in 22 pilot villages and started in the rest of the villages after recommendations from the MTR mission
28	Links with government and other service providers	Number of events		719	—
29	Establishment of demonstration plots of different technologies	Number		1,557	16 types of improved/climate-resilient farming technologies demonstrated in 1,557 households
30	Institutional, strip, and homestead plantation	Number of seedlings		207,042	Mango (Amropali), Mahagoni, Amloki, Arjun, Garjan, hogplum, Gamar, jackfruit, lemon, guava, Bohera, betel nut, Horitaki, hybrid acacia, and bamboo
31	Federation registration from Cooperative Department	Number	55	55	Registration completed
32	GRC meetings	Number		20	

- *Annual household income increased.* The annual household income of the beneficiaries, across all the forest zones, was BDT 112,499 ± 2,857. The average annual household income was found to be the maximum in the coastal forest zone (BDT 118,838 ± 5,672) followed by the social forest zone (BDT 113,674 ± 7,727) and the hill forest zone (BDT 107,243 ± 3,170). Overall, the average annual family income for both control households (BDT 80,692 ± 4,102) and baseline (BDT 84,788 ± 2,160) were found to be lower than the project beneficiaries (BDT 112,499 ± 2,857).

- *ICS introduced and fuelwood extraction reduced.* A total of 6,000 beneficiaries were provided with ICS, which reduced fuelwood consumption and therefore fuelwood extraction from forests. The household survey indicated that fuelwood consumption by the ICS receivers was reduced to a substantial extent in all the forest zones. In the hill forest zone, fuelwood consumption for only FDG members was reduced from BDT 12,999 ± 2,677 in the baseline to BDT 3,279 ± 419 at the end of the project. Similarly, in the coastal forest and SF zone, the consumption and extraction of fuelwood from forests was reduced. For beneficiaries who fell into both the FDG and Participatory Benefit Sharing Agreement (PBSA) categories, the fuelwood extraction and consumption from forests was reduced in both the hill (BDT 14,239 ± 2,300 in baseline to BDT 3,850 ± 620 at the end of the project) and coastal

forest zones (BDT 883 ± 384 in baseline to BDT 336 ± 158 at the end of the project). Moreover, the overall extraction of fuelwood from forests was reduced irrespective of beneficiary types and forest zones (BDT 5,642 ± 462 per year in baseline to BDT 2,716 ± 178 per year at the end of project). The reduction may be due to the combined effect of ICS and awareness creation among the forest users.

- *Grievances handled.* Seven-member GRCs were set up under each forest range. Out of the total of 30 complaints received 16 were resolved. These numbers are negligible comparatively to the total number of project affected people. The complaints were mostly related to selection of SF participants; participants not being inhabitants of the area (for example, Rohinga or person living abroad as a wage earner); convicted persons; and more than one plot in the same family or one person getting plots twice.

Component 3: Capacity Development for Forest Resource Planning and Management

- *Reforms and related activities completed.* The National Forestry Policy of 1994 and FMPs were updated. The Forest Resource Monitoring and Assessment Protocol was established.

- *Capacity building completed.* Training for the BFD and MoEF staff included 5 overseas certificate courses, 26 exposure visits, and 25 training programs building the capacity of 51 BFD and 5 MoEF officers. Under the administrative training programs at the Forest Academy, 17,000 beneficiaries (12,330 men and 4,670 women) and 380 BFD staff were trained.

- *Mapping and monitoring of plantations completed.* Land use and land cover maps of the project areas were prepared, the plantation boundaries were delineated, and GIS-compatible boundary layers of the entire block and strip plantation parcels planted in 10 target forest divisions obtained by the ground survey with GPS measurement were prepared. In addition, the guidelines and methodologies for (a) estimation and monitoring of biomass and carbon, (b) estimation of allometric equations for tree species, and (c) periodic monitoring of the survival rates and biomass growth rates were developed. The (a) survival rates of tree species in all the plantation parcels, (b) biomass growth rate, and (c) total biomass accumulated in different plantation parcels were completed. A two-day long training program on forest biomass and carbon stock assessment was conducted for the BFD staff.

- *RIMS Unit upgraded.* The project support delivered the design of GIS/MIS database management, reporting and mapping, design of the RS survey in forests resources, design of the Forest Inventory, design of the socioeconomic household survey, preparation and pilot testing the Forest Resource Monitoring and Assessment Protocol, and training of the BFD staff. Software and hardware to support these activities were purchased, including ERDAS Imagine Professional, ARCGIS Desktop Advanced, ECognition Developer, ENVI (one license for each software), 14 high-configuration desktop computers, laser printer, scanner, forest measuring equipment and GPS, and high-speed Internet with dedicated bandwidth.

- *Communication strategy developed.* The communication strategy included interpersonal communication and outreach activities (future search conference, interactive group meeting, street drama, and art competition); information, education, and communication material preparation and publication (poster, factsheet, leaflet, sticker, brochures, youth booklet, billboard, and so on); advocacy at the local and national level (website, Facebook page, photo book, documentary, and so on); and capacity-development programs (workshops and trainings). The information, education, and communication materials were distributed among the target audience of the 10 project areas. Table 2.2 provides additional details.

Table 2.2. Summary of Communication Activities Supported by the Project

Program sections	Programs	Number of Program/Materials	Number of Participants
IPC and outreach activities	Future search conference	10 in 10 forest divisions	Average 40–45 per conference
	Interactive group meetings	50	Average 50–60
	Street drama	20 (2 in each forest division)	Unlimited
	Art competition	7	Average 26–30
Information, education, and communication material preparation and publication	Poster (Bengali)	10,000	—
	Factsheet (English)	15,000	—
	Leaflet-1 (Bengali)	20,000	—
	Leaflet-2 (Bengali)	20,000	—
	Sticker-1	7,500	—
	Sticker-2	7,500	—
	Brochure	10,000	—
	Youth booklet	10,000	—
	Billboard	10 (1 in each forest division)	—
Advocacy	Booklet at local level		
	Factsheet and website, project brochures, photo book, and documentary for national level		
Capacity building	Three-day management material development workshop		
	One-day training workshop on Climate Resilient Participatory Afforestation and Reforestation Project (CRPARP) website		
	One-day training on local level advocacy and community engagement		

Annex 3. Economic and Financial Analysis

1.   The economic and financial analyses of the project are based on the CBA approach. The economic analysis includes separate CBAs for Components 1 and 2 and then captures the results into an aggregated CBA at the project level. The financial analysis addresses the financial viability of the project from the perspective of the main stakeholders involved: Government (BFD) and communities.

Economic Analysis

2.   The economic analysis includes four CBAs, relating to (a) Component 1. afforestation and reforestation program (US$21.26 million); (b) Component 2. Alternative livelihoods to support forest communities (US$5 million); (c) integrated analysis for Components 1 and 2, and (d) integrated analysis at project level (except for Component 4. Project management). All analyses use a discount rate of 10 percent and a time horizon of 30 years, to account for the climate change benefits of the project.

Component 1. Afforestation and Reforestation Program

3.   Table 3.1 identifies the main costs and benefits related to Component 1. The indirect benefits from coastal forests (for example, offshore fishery, storm protection) differ substantially from those provided by hilly forests (for example, landslide protection). Thus, the CBA is carried out separately for coastal and hilly forests.

Table 3.1. Benefits and Costs Linked to Component 1 by Area

	Type of Benefit	Coastal Areas	Hilly Areas
Costs		Afforestation costs Opportunity cost of land Rehabilitation of field infrastructure Beneficiaries' selection and M&E	Afforestation costs Opportunity cost of land Rehabilitation of field infrastructure Beneficiaries' selection and M&E
Benefits	Direct uses	Wood (strip zone) NWFPs	Wood (strip zone) NWFPs
	Indirect uses	Offshore fishery Storm protection	Protection from landslides
	Non-use	Biodiversity	Biodiversity

Note: NWFPs = Non-wood forest products.
Forests may provide additional benefits compared to those mentioned in the table. For example, forests may protect against storm surges also in hilly areas that are close to the sea and vulnerable to cyclones.

4.   The costs and benefits related to coastal forests are evaluated on the planting achieved during project implementation, as presented in table 3.2. During the period implementation period (July 2013–December 2016), a total of 17,500 ha and 2,000 km were planted in the 10 target forest divisions. They include mangrove afforestation (6,350 ha), mound (155 ha), *jhau* plantation (258 ha), enrichment plantation (260 ha), non-mangrove plantations (278 ha), *golpata* (943 km), and strip plantation (1,057 km). The analysis assumes that wood will be harvested from the strip zone, with a rotation period of 15 years. For hilly areas, the analysis includes the costs and benefits related to the core (2,774 ha) and buffer zones (7,425 ha). Timber will be harvested from the buffer zone, with a rotation period of 15 years.

Table 3.2. Divisionwise Annual Average Area Re/afforested in the CRPARP Areas from 2013–2014 to 2015–2016

Plantation Type	Planting Target		Planting Achieved			
	Earlier	Revised	2013-2014	2014-2015	2015-2016	Total
	ha/km	ha/km	ha/km	ha/km	ha/km	ha/km
Mangrove Afforestation	5,700 ha	6,350 ha	1,968.1 ha	3,000 ha	1,381.9 ha	6,350 ha
Mound Plantation	427 ha	155 ha	69 ha	47 ha	39 ha	155 ha
Jhau Plantation (Casuarina)	410 ha	258 ha	82 ha	106 ha	70 ha	258 ha
Golpata Plantation (Nipa)	635 km	943 km	127 km	508 km	308 km	943 km
Enrichment Plantation	260 ha	260 ha	0 ha	125 ha	135 ha	260 ha
Core Zone Plantation	3,878 ha	2,774 ha	0 ha	1,686 ha	1,088 ha	2,774 ha
Buffer Zone Plantation	5,925 ha	7,425 ha	2,623 ha	3,255 ha	1,547 ha	7,425 ha
Non mangrove (Buffer) Plantation	400 ha	278 ha	80 ha	98 ha	100 ha	278 ha
Strip Plantation	1,037 km	1,057 km	412 Km	458 km	187 km	1,057 km
Total	17,000	17,500 ha	4,822	8,317 ha	4,361 ha	17,500ha
	1,672	2,000 km	539 km	966 km	495 km	2,000 km

Source: BFD (2016) and Final ICR of CRPARP.

Costs

5.   ***Afforestation and harvest***. Afforestation costs include nursery raising, plantation, and maintenance. The actual planting achieved for each plantation type during the project implementation (2013 to 2016) is presented in table 3.2. For each plantation, nursery raising was followed by two-year maintenance. The labor cost varied from as low as 32 percent of the total cost of nurseries and plantation (for *golpata*) to 99 percent of the total cost of maintenance (for strip plantations).[24] A conversion factor of 0.75 is used to express the opportunity cost of unskilled labor in coastal areas.[25] Accordingly, the present value (PV) of the total cost of afforestation and harvest, in coastal areas, reaches BDT 366 million. Information on the afforested area in hilly areas is taken from table 3.2. For both core and buffer zones, the labor cost is about 40 percent of the total cost of nurseries and plantation and about 90 percent of the total cost of maintenance. A conversion factor of 0.75 is used to express the opportunity cost of unskilled labor in coastal areas.[26] Accordingly, the PV of the total cost of afforestation and harvest is estimated at BDT 698 million. The total cost for afforestation and harvest is BDT 1,064 million.

6.   ***Opportunity cost of land***. This is the value of activities or land uses that the team estimates will be forgone in the areas afforested by the project. The coastal area where the project was implemented was used primarily for grazing and fishing. The analysis estimates that only grazing has been restricted for the initial three years (plantation and maintenance years), to allow for natural growth. The net returns from fodder grazed in this area are roughly estimated at BDT 18,000 per ha per year.[27] Therefore, the opportunity cost on 7,301 ha of land is BDT 272 million.[28] The land afforested in hilly areas was used for

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[24] The labor cost varies according to the type of forests. It represents 45 percent of the total nursery and plantation cost for mangroves, 83 percent for mound, 40 percent for jhau, 32 percent for *golpata*, 45 percent for enrichment, 43 percent for non-mangrove, and 40 percent for strip plantation. The labor cost also accounts for 79 percent of the total maintenance cost for mangroves, 89 percent for mound, 84 percent for jhau, 90 percent for *golpata*, 97 percent for enrichment, 91 percent for non-mangrove, and 99 percent for strip (Choudhury 2012).

[25] It represents the shadow wage conversion factor for skilled and unskilled labor in the construction and crop cultivation sectors in Bangladesh. It is estimated by dividing the shadow wage of unskilled labor (BDT 150) to the market wage (BDT 200). The former is calculated based on the market wage during peak and lean seasons, unemployment rate, and the social cost of consumption. Reference is made to the detailed calculations provided in the economic analysis of the Coastal Embankment Improvement Project.

[26] It represents the shadow wage conversion factor for skilled and unskilled labor in the construction and crop cultivation sectors in Bangladesh. Detailed calculations are provided in the economic analysis of the Coastal Embankment Improvement Project.

[27] It corresponds to the difference between the gross benefit of BDT 30,000 (2,000 bags of fodder at a price of BDT 15 per bag) and the labor cost of BDT 12,000 (60 days).

[28] It is assumed that grazing does not affect the strip plantations.

grazing and fuelwood collection. The returns from these activities have been roughly estimated at about BDT 20,800 per ha per year.[29] Considering that the project will forgo the benefits from these activities during plantation and maintenance, the opportunity cost of land is BDT 437 million. The total cost under this activity is BDT 709 million.

7.   ***Rehabilitation of field infrastructure***. Assuming that the efforts of rehabilitation (about US$3 million) are equally distributed between coastal and hilly areas, the PV of the cost related to coastal areas is BDT 92 million. Similar to the case of coastal afforestation, the PV for hilly areas is BDT 92 million. The total cost under this activity is BDT 184 million.

8.   ***Beneficiaries' selection and M&E***. Selection of project beneficiaries occurred in the first project year. M&E cover years 3 to 5 of the project. The PV of this cost is estimated at BDT 38 million. The PV in hilly areas is estimated at BDT 38 million. The total cost under this activity is BDT 76 million.

9.   Overall, the economic cost for coastal areas is BDT 768 million and for hilly areas is BDT1.3 billion, for a total cost of Component 1 of BDT 2.0 billion.

Benefits

10.   The estimation of the benefits is based on the assumption that forests are maintained during and after the end of the project. This is particularly important for intangible services such as storm protection benefits provided by mangroves. To account for any uncertainty, the CBA is followed by a sensitivity analysis for different deforestation rates.

11.   **Timber.** Timber in coastal areas will be extracted from strip plantations in year 10. According to the Forest Department, yields include poles (7–8 m^3 per km), saw logs and peeler logs (19 m^3 per km), and fuelwood (11 m^3 per ha). The average stumpage prices are BDT 70 per pole, BDT 12,600 per cubic meter of saw logs and peeler logs, and BDT 1,260 per cubic meter of fuelwood. Accordingly, the PV of wood benefits from 1,057 km of strip plantations is estimated at BDT 244 million.[30] In hilly areas, timber is expected to be extracted from buffer zones in year 10. According to the Forest Department, yields include poles (210 per ha), saw logs and peeler logs (17 m^3 per km), and fuelwood (13 m^3 per ha). The average stumpage prices are BDT 70 per pole, BDT 12,600 per cubic meter of saw logs and peeler logs, and BDT 1,260 per cubic meter of fuelwood. Accordingly, the PV of wood benefits is estimated at BDT 1.7 billion.[31]

12.   *NWFPs*. Information on harvested NWFPs in Bangladesh are scarce and outdated. It is, however, acknowledged worldwide that mangrove forests provide a wide range of benefits such as fisheries, bamboo, honey, coastal protection, and so on. Rönnbäck's (1999)[32] summary of mangrove valuation studies reveals that the marketed value of fisheries dependent on mangroves ranges from US$850 to US$16,750 per ha per year. Other estimates are substantially more conservative, such as for India and southern Thailand. Adjusting the most conservative estimate (US$88 per ha in southern Thailand) to year 2011, and considering a survival rate of 80 percent (World Bank 2002),[33] the annual NWFPs benefit would be US$87 per ha in 2011. For this analysis, it is assumed that mangroves in coastal areas will provide these benefits starting at year 5, with a PV over the 30-year period of BDT 501 million.

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[29] This corresponds to the net returns from grazing (BDT 20,000) and from fuelwood (BDT 2,800 per ha, similar to the benefit estimated for the Karnataka Watershed project in India).

[30] Additional benefits include wood removals from thinning, for which no data are yet available.

[31] Additional benefits include wood removals from thinning, for which no data are yet available.

[32] Rönnbäck, P. 1999. The ecological basis for economic value of seafood production supported by mangrove ecosystems. Ecological Economics 29: 235-252.

[33] WBG strategy, Sustaining Forests: A Development Strategy, 2002.73pp.

13.   In hilly areas, forests in Bangladesh provide many NWFPs, such as food, medicine, honey, essential oil, spice, resin, gum, latex, fiber and floss, bamboo and cane, broom grass, sungrass, mushrooms, and tamarind (Zashimuddin 2004).[34] Though the important NWFPs generate only about 6 percent to 8 percent of the BFD's total revenue, they support the economic activities of at least 0.6 million people (FAO 2011). No statistics on the NWFPs collected from hilly forests exist in Bangladesh. In addition, attaching a monetary value to the NWFPs is extremely difficult, primarily because many of these products have subsistence rather than market uses. A review of the NWFPs estimates provides a mean value of US$200 per hectare of forests in India (Chopra 1993,[35] adjusted to 2011 prices). Assuming that the buffer and core plantations will provide similar benefits starting with year 5, the PV is BDT 1.5 billion.

14.   ***Offshore fishery - coastal areas***. By fertilizing the sea, mangroves serve as breeding and feeding grounds to support offshore fishery[36] (Ramaiyan et al 2002).[37] Fish diversity tends to be higher during the winter season and lower during the monsoon (Saravanakumar et al. 2008;[38] Kathiresan and Rajendran 2002[39]). No study has estimated the value of offshore fishery provided by mangroves in Bangladesh. Sathirathai and Barbier (2001)[40] estimated this value in southern Thailand at US$21.69, averaging to US$45 per hectare of mangrove.[41] Assuming that the project's mangroves will provide these benefits starting in year 5, the PV is BDT 256 million.

15.   ***Storm protection - coastal areas***. Available literature focuses mostly on the links between mangroves and storm-protection benefits. Though their ability to protect against storm damages has been much debated, recent studies argue that mangroves can provide significant protection from surge during cyclones. The protective role of the project's mangroves is estimated in terms of averted deaths and house damages (that is, Das and Vincent 2009).[42]

16.   *Averted deaths*. Das and Vincent (2009) statistically analyzed the role of coastal mangroves in averting deaths caused by the 1999 super cyclone in Orissa. They predicted that mangroves within 10 km of the coast saved 0.0148 lives per ha.[43] It is assumed that the project's mangrove plantations will provide a similar protective value against super cyclones in Bangladesh.

17.   Cyclones hit the coastal regions of Bangladesh every year. Table 3.3 provides basic information about the different types of cyclones that make landfall in the country. Each year, the probability of a super

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[34] Zashimuddin M. 2004. Community forestry for poverty reduction in Bangladesh. In: Sim HC, Appanah S, Lu WM (eds) Forests for poverty reduction: can community forestry make money? FAO-RAP, Bangkok, Thailand, pp 81–94

[35] Chopra, Kanchan. 1993. The Value of Non-Timber Forest Products: An Estimation for Tropical Deciduous Forests in India. Economic Botany: 47 (3): 251-257.

[36] This function is an indirect use value, which is different from the inshore fish catch, estimated within the NWFPs' section.

[37] Ramaiyan V, Senthilkumar R, Rajasegar M. 2002. Finfish Resources of Pichavaram mangrove Ecosystem. Annamalai University, India, p. 94.

[38] Saravanakumar, A., M. Rajkumar, J. Sesh Serebiah and G.A. Thivakaran. 2008. Seasonal variations in physico-chemical characteristics of water, sediment and soil texture in arid zone mangroves of Kachchh-Gujarat. J. Environ. Biol., 29, 725-732.

[39] Kathiresan, K. and Rajendran, N. 2002. Fishery resources and economic gain in three mangrove areas on the south☐east coast of India. Fisheries Management and Ecology 9(5):277 – 283.

[40] Sathirathai, S. and Barbier, E.B. 2001. Valuing Mangrove Conservation in Southern Thailand. Contemporary Economics Policy 19(2): 109-122.

[41] The benefit remains the same after adjustment with the survival rates and differences to 2011.

[42] Das, S. and Vincent, J.R. 2009. Mangroves protected villages and reduced death toll during Indian super cyclone. Proc Natl Acad Sci USA 106:7357–7360.

[43] The model predicted that there would have been 1.72 additional deaths per village within 10 km of the coast if the mangrove width had been reduced to 0.

cyclone is at least 10 percent (Dasgupta et al 2010).[44] Thus, the project's planted mangroves (6,350 ha) would be able to save 84 lives with a probability of 10 percent in year 5 of the analysis.

18.   The coastal population in Bangladesh is projected to grow 1 percent per year until 2050. At the same time, the development of alternative protective measures over time (for example, cyclone shelters and more resilient houses) is expected to reduce forests' lifesaving benefit. Accordingly, it is assumed that, over time, the protective role of mangroves will decrease proportionately with the trend of more resilient houses,[45] until 2050.

Table 3.3. Types of Cyclones in Bangladesh

Type of Cyclone	Wind Velocity (km/h)	Storm Surge (m)	Probability of Occurrence Every Year (%)
Super cyclone	>220	6–7.8	10
Very severe cyclone	119–220	2.5–6	20
Severe cyclone	90–119	1.5–2.5	30

Source: MCSP (1993) for wind velocity and storm surge. Dasgupta (2010) for probability of occurrence.

19.   Attaching a monetary value to human life is difficult. The most appropriate measure of the benefit from reduced risk of fatality is the 'Value of Statistical Life' (VSL), which seeks to estimate the monetary equivalent of improved well-being for individuals from reduced mortality risk. Local surveys estimating the VSL for Bangladesh are not available. Thus, the VSL for Bangladesh is estimated at US$251,844, after updating the United States central estimate of US$7.4 million (2006) available from the Environmental Protection Agency (EPA) with price adjustment between 2006 and 2017 and gross domestic product differential between the United States and Bangladesh.

20.   Conservatively assuming only 50 percent of the VSL estimated above, the lifesaving benefit of mangroves is valued at US$5 million or BDT 465 million. This value is just a rough estimation of the protective role of mangroves.[46]

21.   *Averted house damages*. Das (2007) estimated the protective benefit of mangroves in terms of averted damages to residential property caused by the 1999 super cyclone in Orissa. It was found that mangroves significantly averted the number of fully collapsed houses, to the extent of US$23,200 per kilometer width of forests or US$1,218 per hectare of forests. Assuming a similar protective value for this project means that 1 hectare of mangroves in Bangladesh would avert US$560 worth of housing damages caused by super cyclones, after adjusting for gross domestic product differentials.

22.   The number of households in the districts worst affected by Cyclone Sidr was 12.4 million in 2007 as reported by GoB in 2008. Projection of population in coastal regions by 2050 indicates that an additional 7.1 million inhabitants will be exposed to significant damages from storm surges in changing climate conditions. Considering an average family size of 4.9, this corresponds to 1.5 million houses. In addition, the larger areal extent of a cyclone under climate change means that an additional 1.6 million houses could be damaged from a 10- year return period cyclone due to climate change (Dasgupta et al 2010). Thus, by

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[44] Dasgupta, Susmita; Huq, Mainul; Khan, Zahirul Huq; Ahmed, Manjur Murshed Zahid; Mukherjee, Nandan; Khan, Malik Fida; Pandey, Kiran. 2010. Vulnerability of Bangladesh to cyclones in a changing climate: potential damages and adaptation cost. Policy research working paper no. 5280: 54pp. The World Bank.

[45] 'Pucca' houses are currently the most resilient houses and form about 4 percent of total houses. Over the 30-year period, they are expected to increase to 71 percent (based on data collected from the country's Household Income and Expenditure Survey (2005) and the Statistical Yearbook of Bangladesh (2006).

[46] It may easily underestimate the benefit, by not including averted losses in terms of injured people.

2050, the number of houses vulnerable to storm surge from a 10-year return period cyclone would be 15.5 million. This corresponds to an average annual increase of the number of houses of 0.5 percent per year.

23.	It is assumed that the protective value provided by mangroves start in project year 5 (US$716 per ha) and increase by 0.5 percent per year for the 30-year period. Accordingly, the PV of house protection benefits is estimated at US$3 million, or BDT 238 million. As in the case with the benefit of averted deaths, this valuation is a rough approximation of the overall benefit.

24.	***Protection against landslides - hilly areas***. It is commonly known that in steep terrain, forests protect against landslides by modifying soil moisture regime, providing root cohesion to soil, and maintaining secondary permeability in the soil (Sidle et al. 2006).[47] However, recent research shows that in extremely vulnerable zones, erosion from steep slopes occur independently of the land use. Under certain circumstances, deforestation may increase erosion and reforestation helps moderate the effects of some extreme rainfall events but without stopping erosion and destructive sediment transport[48] (Wasson et al. 2008). Thus, the role of reforestation in protecting against landslides is not yet thoroughly understood. Estimating the forests' benefit in preventing landslides is thus very difficult.

25.	Landslides are common phenomena in Bangladesh, particularly in Chittagong and the Chittagong Hill Tract region. Unsustainable land use, hill cutting, and deforestation are cited as major factors aggravating landslide vulnerability in these areas (Mahmood and Khan 2008). The frequency and intensity of landslides have increased dramatically in recent years: a landslide inventory prepared by the Disaster Management and Relief Division (DMRD) reveals 24 major landslide events in Cox's Bazar and Chittagong Districts during 2003–2010 (DMRD 2011). The landslide in 2007 in Chittagong was the worst, causing 128 deaths and damaging about 900,000 houses.

26.	Forests' benefit in preventing landslides can be estimated through the avoided damages that these landslides would cause in the absence of forests. In South Asia, the effects of forest conversion on landslides have been little studied; thus, uncertainties exist related to effects of land cover change.[49] Evidence of the landslide impact caused by deforestation has been found only in Indonesia[50] and Thailand[51] (Sidle et al. 2006). In central Japan, forest cover is estimated to reduce landslide erosion four to five times compared with sites that lack substantial tree root strength[52] (Imaizumi et al. 2008).[53] In North America, clear cutting in steep terrain has been shown to increase landslide erosion by 2–10 times (Sidle et al. 1985).[54] However, none of these studies estimated these benefits. These examples confirm the difficulties in predicting the

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[47] Roy C. Sidle, Alan D. Ziegler, Junjiro N. Negishi, Abdul Rahim Nik, Ruyan Siew and Francis Turkelboom. 2006. Erosion processes in steep terrain—Truths, myths, and uncertainties related to forest management in Southeast Asia. Forest Ecology and Management 224 (1-2): 199-225.

[48] In other cases, reforestation may trigger erosion and landslides, if undertaken inappropriately, because of the weight of the trees.

[49] For example, the 1988 landslides in northern Thailand, during an intense monsoon storm, yielded somewhat different conclusions related to the role of converted forest cover to landslide erosion. DeGraff (1990) suggested that forest conversion to weaker-rooted rubber plantations was responsible for a higher level of land sliding; conversely, Phien-Wej et al. (1993) noted that landslide density appeared independent of vegetation cover, implying that the storm magnitude overwhelmed the stabilizing influence of the different root strengths.

[50] In Sumatra (Indonesia), conversion of tropical forests to coffee plantations produced three shallow landslides with a soil loss of 31–113 m^3 per landslide occurring 14–16 years after conversion.

[51] In northern Thailand, river incision and deforestation caused 16 landslides with a soil loss of 25–5260 m^3 per landslide.

[52] These benefits appear to be primarily associated with reducing the frequency of smaller landslides.

[53] Fumitoshi Imaizumi, Roy C. Sidle, and Rieko Kamei, 2008. Effects of forest harvesting on the occurrence of landslides and debris flows in steep terrain of central Japan. Earth Surf. Process. Landforms 33, 827–840

[54] Sidle, R.C., Pearce, A.J. and O'Loughlin, C.L. (1985) Hillslope stability and land use. *Water Resources Monograph*, vol. 11. American Geophysical Union, Washington, DC, 140 pp.

reduction in the frequency and magnitude of landslides caused by the project activities. Thus, this valuation will make use of estimates from other studies in contexts as similar as possible.

27. In North African countries, forests' protection against erosion, floods, and landslides have been estimated in the range of US$35–42 per hectare of forests (Croitoru and Merlo 2005). The economic value of forests for preventing avalanches is estimated at around US$100 per hectare per year in open expanses of land in the Swiss Alps up to more than US$170,000 per hectare per year in areas with valuable assets (ProAct Network 2008).[55] In Indonesia, the annual value of forests' protection function against floods and landslides was estimated at US$34 per hectare of forests (IES 2009). Conservatively assuming that the project's hilly forests provide US$34 per ha per year in erosion, floods, and landslides prevention, the PV of this benefit after year 5 would be BDT 251 million. This is a very conservative estimate, as it does not capture lifesaving and other avoided damages that could be potentially high.

28. Overall, the economic benefits in coastal areas add up to BDT 1.7 billion and in hilly areas up to BDT 3.4 billion, for a total benefit of BDT 5.1 billion.

Cost-Benefit Analysis

29. The results of the CBA in coastal areas are positive, with a net present value (NPV) of BDT 936 million, a benefit-cost (B/C) ratio of 2.2, and an IRR of 18 percent (Table 3.4). The CBA in hilly areas provides an NPV of BDT 2.1 billion, a B/C ratio of 2.7, and an IRR of 14.6 percent (table 3.4). Overall, Component 1 provides net economic benefits of BDT 2.4 billion over 30 years. It has a B/C ratio of 2.2 and an IRR of 14 percent (table 3.4). It should be emphasized that these benefits depend on (a) the ability to maintain the plantations during and after the end of the project,[56] (b) adopting coastal mangroves under certain technical parameters, such as minimum width, and (c) adopting appropriate species in hilly areas that are able to provide protection against landslides and erosion.

Table 3.4. CBA of Component 1 (PV, BDT, million)

Item	Coastal Forests	Hilly Forests	Total
Costs	**768**	**1,265**	**2,033**
Afforestation	366	698	1,064
Opportunity cost of land	272	437	709
Rehabilitate field offices	92	92	184
Beneficiaries selection	5	5	11
Monitoring	33	33	65
Benefits	**1,704**	**3,390**	**5,094**
Wood	244	1,657	1,901
NWFPs	501	1,483	1,983
Offshore fishery	256	n.a.	256
Storm protection (averted deaths)	465	n.a.	465
Storm protection (averted house damages)	238	n.a.	238
Landslide protection	n.a.	251	251
Net benefits	**936**	**2,126**	**3,061**
B/C ratio	2.2	2.7	2.5

[55] ProAct Network. (2008). *Environmental Management, Multiple disaster risk reduction and climate change adaptation benefits for vulnerably communities.* Tannay, Switzerland: ProAct Network. Available at:www.proactnetwork.org
[56] In the absence of accurate information, the economic analysis was based on a survival rate of 80 percent, according to the Forest Department.

Item	Coastal Forests	Hilly Forests	Total
IRR (%)	**18**	**15**	**16**

Note: n.a. = Not applicable.

30.	*Sensitivity analysis*. The success of this component is largely dependent on the ability to maintain these forests. Thus, a sensitivity analysis was conducted for different deforestation rates, assuming a constant deforestation rate every year after project ends.[57] Table 3.5 shows that investment in coastal forests is reduced by almost a 1:1 ratio for every increase in the deforestation rate. In hilly areas, the NPV is less sensitive to deforestation rates, falling to almost 12 percent at a rate of 5 percent deforestation. At a rate of 8 percent deforestation, the IRR is 10 percent.

Table 3.5. Sensitivity Analysis for Different Deforestation Rates

Deforestation Rate (%)	IRR in Coastal Areas (%)	IRR in Hilly Areas (%)
1	17.0	14.0
2	15.9	13.3
3	14.7	12.7
4	13.6	12.1
5	12.4	11.6

Component 2. Alternative Livelihoods to Support Forest Communities

31.	To maintain natural growth of afforested areas under Component 1, access of forest communities to these lands was limited for the first three years. As a result, communities had to forgo benefits such as grazing and fuelwood collection in afforested areas. To compensate for these losses, Component 2 provided communities other income-generating activities and benefits from plantation thinning. This section estimates the economic IRR of this component, focusing only on small-scale livelihood activities at the household level.[58] About US$936,400 (BDT 76 million) was channeled as endowment fund to 200 community-based groups of 6,000 FDGs. The results show that 92 percent of the FDG members received the MRSLF once. Around 1,726 participants (29 percent) received the MRSLF for a second time. The loan size ranged from BDT 5,000 to BDT 25,000 for 12 months at 5–10 percent interest/service charge, with a recovery rate of 100 percent. There was a total of 7,274 loans for a total MRSLF distribution of BDT 95 million.[59]

Costs

32.	**Direct costs** of this component include the funds channeled as endowment funds and all other administrative costs (for example, selection of NGOs in different areas, supervision, and training), which total US$5 million or BDT 404 million. The PV of these costs amount to BDT 368 million.

33.	**Indirect costs** include forgone benefits of grazing and fuelwood during the three-year limited access in the afforested land. The forgone benefits are estimated at BDT 2,700 per household per year and

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[57] In addition, we assume that benefits will be lost proportionally to the deforestation rate, because of lack of more accurate data.
[58] It was not possible to carry out an analysis of the economic activities at the community level, due to lack of data.
[59] Several benefits are not quantified here, including the distribution of fruit and timber tree samplings and the distribution of ICS.

include BDT 2,100 worth of grazing[60] and BDT 600 worth of fuelwood.[61] The total forgone benefits for 7,274 households amount to BDT 20 million per year. The PV of these costs amount to BDT 49 million.

34.   Overall, the PV of the total cost is BDT 416 million.

Benefits

35.   ***Improved communities' welfare***. The AF has a long track record of promoting AIGAs among the FDGs and reducing their dependence on forest resources. According to rough estimates, the gross returns of AIGAs range from 1.2 to 3.1 times the investments, averaging 2.1. Assuming the average profitability rate and the average loan of BDT 13,085 for 7,274 households,[62] the PV of these benefits would be BDT 634 million.

36.   ***Forest protection benefits***. AIGAs are meant to increase protection of the project's afforested lands by releasing pressure on forests. These benefits have been already included and estimated in the economic analysis of Component 1.

Cost-Benefit Analysis

37.   Overall, Component 2 provides net economic benefits of BDT 217 million. It has a B/C ratio of 1.5 and an economic IRR of 28 percent (table 3.6).

Table 3.6. CBA of Component 2 (PV, BDT, million)

Item	PV (BDT, million)
Costs	**416**
Direct costs (endowment fund and administrative costs)	368
Indirect costs (forgone benefits)	49
Benefits	**634**
Improved communities' welfare	634
Net Benefits	**217**
B/C ratio	1.5
IRR	28%

38.   A sensitivity analysis to changes in AIGAs' profitability rates shows that Component 2 becomes unattractive when gross returns from AIGAs are less than 1.25 times investment (table 3.7).

Table 3.7. Sensitivity Analysis of Component 2 (PV, BDT, million)

AIGAs Profitability Ratio	NPV (BDT, million)
Base analysis (profitability ratio 2.1)	217
1.75	112
1.50	36
1.25	–39

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[60] Hossain et al. (2005) estimate that the net benefit per cow is about BDT 10 per household per day. The average number of cattle per household is about 1.07 in Bangladesh (BBS 2009). Considering a grazing period about 200 days per year, the benefit from fodder is estimated at about BDT 2,100 per household per year.

[61] The annual fuelwood consumption in Bangladesh is about 0.1 m^3 per capita (Sohel et al. 2006), or 0.5 m^3 per household. At a price of BDT 1,260 per m^3, the net benefit from fuelwood consumption would be around BDT 600 per year.

[62] Communities will benefit also from wood from thinning of strip plantations on coastal areas and from the buffer zone in hilly areas, in years 4 and 7 after plantation. Unfortunately, it is not known how much wood can be derived from thinning, on a per household basis.

39.   Table 3.8 presents the results of the economic analyses carried out for Components 1 and 2. The integrated IRR is estimated at 18 percent.[63]

Integrated CBA at project level

40.   Component 3 was integrated into the CBA analysis. This component (US$5.77 million) aimed to improve the technical knowledge base on forest resource assessment, program monitoring, and long-term planning for the sustainable development of the forest sector. However, these benefits are not measurable and are expected to take place in the long run. The integrated CBA shows an NPV of BDT 2.9 billion, a B/C ratio of 2.0, and an IRR of 14 percent. These are conservative results, by not capturing several benefits that will take place in the future, for example, strengthened institutional capacity for monitoring and so on.

Table 3.8. CBA (PV, BDT, million)

	Components 1 and 2	Components 1,2,3
COSTS	**2,449**	**2,819**
Component 1		
- Afforestation	1,064	1,064
- Opportunity cost of land	709	709
- Rehabilitate field offices	184	184
- Beneficiaries selection	11	11
- Monitoring	65	65
Component 2		
- Direct costs (endowment fund and administrative costs)	368	368
- Indirect costs (forgone benefits)	49	49
Component 2		
- Capacity development	—	370
BENEFITS	**5,728**	**5,728**
Component 1		
- Wood	1,901	1,901
- NWFPs	1,983	1,983
- Offshore fishery	256	256
- Storm protection	703	703
- Landslide protection	251	251
Component 2		
- Improved communities' welfare	634	634
Component 3		
- Strengthened capacity of FDGs and communities	—	Not measurable
Net benefits	**3,278**	**2,909**
B/C ratio	2.3	2.0
Integrated IRR (%)	**18**	**14**

Financial analysis

41.   This section discusses the financial viability of the project, to ensure that afforested lands will be maintained beyond the project implementation period. The financial viability depends on (a) the BFD's ability to cover the costs related to the afforested areas beyond the end of the project activity and (b) the project's ability to provide co-benefits to the forest community that would stimulate the maintenance of the

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[63] Calculated as a weighted average of the IRRs calculated previously by the cost of each Component (1 and 2).

project's forests. Thus, the following paragraphs provide a financial CBA at the levels of the BFD and AIGA grant beneficiaries.

Financial Analysis of Forest Department

42.   This analysis includes the financial costs that were covered by the BFD and the benefits that will likely be received.

43.   **Costs.** Plantation establishment for afforestation is followed by a two-year maintenance, implying that plantations carried out in year 4 will need to be maintained during years 5 and 6. Because the project extends to five years only, the BFD needs to cover the cost of maintenance for year 6, which is equivalent to a PV of BDT 53 million.

44.   **Benefits** include revenues from wood harvest, occurring in year 15 from strip and buffer zones. As estimated in the economic analysis, the value of these benefits reaches BDT 2.1 billion. It is expected that the BFD receives 45 percent of these benefits,[64] or BDT 703 million.

45.   Overall, the CBA is positive, with an NPV of BDT 604 million and a financial IRR of 41 percent. After project closing, community resources will need to be allocated for forest maintenance.

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[64] Another 45 percent goes to the selected beneficiaries and 10 percent to a tree farming fund.

Annex 4. Grant Preparation and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending/Grant Preparation			
Shakil Ahmed Ferdausi	Senior Environmental Specialist	SASDI	Team Lead
Junxue Chu	Senior Finance Officer	CTRLN	Disbursement
Cecilia Belita	Senior Program Assistant	SASSD	Operational support
Suraiya Zannath	Senior Financial Management Specialist	SARFM	Financial Management
Ranjan Samantaray	Senior Natural Resources Management Specialist	SASDA	Natural Resources Management
Arvind Prasad Mantha	Financial Management Analyst	SARFM	Financial Management
Anna C. O'Donnell	Social Development Specialist	SASDS	Social Development and Documentation
Marghoob Bin Hussein	Senior Procurement Specialist	SARPS	Procurement
Klas Sander	Senior Natural Resource Economist	SASDI	Forest Economics
Dora Nsuwa Cudjoe	Environmental Specialist	SASDI	Forestry
Jose Ramon R. Pascual IV	Counsel	LEGES	Counsel
Sabah Moyeen	Social Development Specialist	SASDS	Social Development
Janet Bably Halder	Program Assistant	SASDO	Program Support
Marie Florence Elvie	Program Assistant	SASDO	Program Support
Syed Khaled Ahsan	Public Sector Specialist	SASGP	Governance
Nadia Sharmin	Environment Specialist	SASDI/SASDC	Environmental Safeguard
Ishtiak Siddique	Procurement Specialist	SARPS	Procurement
Prof. N H Ravindranath	Consultant		Climate Change, Forest Resource Planning, and Capacity Development
James Carle	Consultant		Silviculture and Forestry Inventory
Teen Kari Barua	Consultant		Social Safeguard
Asyl Undeland	Consultant		Community Development and Livelihoods
Lelia Croitoru	Consultant		Economist

Aminur Rahman Chowdhury	Consultant		Financial Management
Md. Bazlul Kadir	Consultant		Procurement
Junaid Kabir Choudhury	Consultant		Forestry
Supervision			
Shakil Ahmed Ferdausi	Senior Environmental Specialist	GEN06	Team Lead
Tapas Paul	Lead Environmental Specialist	GEN06	Team Lead
Darshani De Silva	Senior Environmental Specialist	GEN06	ICR Team Lead
Carlos Ludena	Economist	FAO	ICR Economist
Ishtiak Siddique	Senior Procurement Specialist	GGO06	Procurement
Mohammed Atikuzzaman	Financial Management Specialist	GGO24	Financial Management
Dora Nsuwa Cudjoe	Senior Environmental Specialist	GENGE	Team member
Iqbal Ahmed	Environmental Specialist	GEN06	Safeguard specialist
Janet Bably Halder	Program Assistant	SACBD	Team member
Madhavi M. Pillai	Senior Natural Resources Management Specialist	GEN06	Team member
Md. Istiak Sobhan	Environmental Specialist	GEN06	Team member
Merin Ahmed Mahbub	Communications Officer	SAREC	Team member
Sabah Moyeen	Senior Social Development Specialist	GSU06	Safeguard specialist
Sharlene Jehanbux Chichgar	Environmental Specialist	GEN06	Team member
Mohammed Sayed	Consultant	GEE06	Team member
Nijavalli Hanumantha Rao Ravindranath	Consultant	GFA12	Team member
Ranjan Samantaray	Consultant	GFA12	Team member
James B. Carle	Consultant	GENDR	Team member

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of Staff Weeks	US$, thousands (including travel and consultant costs)
Lending	0.00	0.00
Total:	**0.00**	**0.00**
Supervision/ICR	17.16	112.00
Total:	**17.16**	**112.00**

Annex 5. Beneficiary Survey Results

Not applicable.

Annex 6. Stakeholder Workshop Report and Results

Not applicable.

Annex 7. Summary of Grantee's ICR and/or Comments on Draft ICR

Summary of Grantee's ICR

1.   The purpose of this Final Impact Assessment Report is to evaluate the impacts of the CRPARP interventions during the project period (July 2013 to December 2016). The report includes achievements of the CRPARP in all relevant aspects of the project, including afforestation, reforestation, livelihood development, reduction of unsustainable and illegal extraction of forest resources, reducing forest dependency of the local people, skill manpower development, renovation and construction of offices for the BFD management units, policy development, awareness building among forest user groups (FUGs), and so on in nine coastal and hill districts of Cox's Bazar, Chittagong, Noakhali, Lakshimipur, Feni, Barisal, Patuakhali, Barguna, and Bhola. The report compared the findings of project completion status and impact assessment survey results with those of the baseline to highlight the achievements.

Area restored or re/afforested

2.   This impact assessment report presented the re/afforested areas of the CRPARP in the project zones. The project achieved its target to establish 17,500 ha block and 2,000 km strip plantations in the 10 target forest divisions during the project implementation period (July 2013 to December 2016). The plantations were of nine categories (core zone, buffer zone, mangrove, non-mangrove, mound, enrichment, *jhau*, *golpata*, and strip) according to the PAD. The study reveals that, on average, 8,822 ha block plantations and 832 km strip plantations were established annually during the CRPARP (2013–2014 to 2014–2015) implementation period, including the plantations established under the CRPARP whereas 7,382 ha block plantations and 1,398 km strip plantations were established annually before the CRPARP (2010–2013) in the 10 forest divisions. The result shows that there is an increasing trend in re/afforestation activities from both development and revenue funds. Share of native plant species in the plantations under the CRPARP increased compared to those outside the CRPARP. The share of Akashmoni reduced to approximately 34 percent in the CRPARP plantations from more than 70 percent in the plantations outside/before the CRPARP.

Baseline household income

3.   Socioeconomic conditions of the sample households revealed that the annual household income of the CRPARP beneficiaries (PBSA, FDG, and laborers) across all the forest zones was BDT 112,499 ± 2,857 which, was substantially higher than that of the baseline (BDT 84,788 ± 2,160). The average annual household income was found to be maximum in the coastal forest zone (BDT 118,838 ± 5,672) followed by the social forest zone (BDT 113,674 ± 7,727) and the hill forest zone (BDT 107,243 ± 3,170). The household survey revealed, among all the beneficiary categories, that the highest income (124,694 ± 7,284) fell in both PBSA and FDG categories. The forest dependency in the form of annual income generation from forests was BDT 6,086 ± 1,003, which is lower than that of the baseline (BDT 7,099 ± 548). The impact study indicates that dependency was still maximum in the hill forest zone (BDT 8,022 ± 773) followed by the coastal forest zone (BDT 5,193 ± 2,363) and lowest in the coastal forest zone (BDT 681 ± 376). For the forest income of the beneficiaries, the major share came from fuelwood (BDT 2,716± 178, 44.62 percent of total forest resource extraction) followed by betel leaf cultivation (BDT 1,483 ± 463,24.4 percent) and timber/sapling (BDT 882 ± 763, 14.49 percent).

Reforms in forest policy, acts, and regulations

4.   To address the current and emerging issues in Bangladesh's forestry sector, the BFD undertook initiatives under the CRPARP for replacing the outdated Forestry Policy of 1994. The National Forestry Policy of 2016 was drafted with six fold objectives to address the challenges and emerging forestry issues

of Bangladesh. Sustainable forest ecosystems with co-benefits of biodiversity conservation, climate change and community well-being, forest management with improved governance and technology, collaboration, and enforcement of forest and wildlife protection were some of the main guiding principles of the new National Forestry Policy. It has been submitted to the MoEF and is now awaiting approval by the ministry.

5. In parallel, acts, rules, and regulations relevant to the forestry sector that is, Ecologically Critical Area Management Rules 2013, E-waste Rules 2013, Protected Area Management Plans (Draft) for Wildlife Sanctuary and National Parks 2015–2016, Ecologically Critical Areas Act (Draft) 2016, National Conservation Strategy (Draft) 2016, and Protected Area rules (Draft) 2016 were formulated during the CRPARP period through other initiatives of the GoB.

Capacity building to improve management of forest resources

6. The CRPARP successfully implemented four technical studies (International Union for Conservation of Nature, AGRER-DTCL-HCL, Bangladesh Center for Communication Programs, and Agriconsulting-SODEV consult); conducted an independent internal audit (SF Ahmed and Co.); administered training programs (Environment Agriculture and Development Services [EADS]); and conducted a third-party assessment and monitoring (Eusuf and Associates) under Component 3 with the aim of improving the current management practices backed by technological intervention, capacity building, and updating the FMP. Under the CRPARP, the plantations were mapped and monitored; forest monitoring protocol was prepared; RIMS was strengthened with equipment, software, and training; mass awareness programs through leaflets, factsheets, booklets, photo books, and so on were conducted; and training programs at the local, national, and overseas levels were arranged successfully to enhance capacity and skill. For capacity building, 51 BFD and 5 MoEF officers participated in overseas certificate programs (5), exposure visits (26), and training (25) programs (**table 20**). Moreover, the EADS trained 17,000 beneficiaries and 380 officers at the local and field levels. The training program for 380 BFD officers or staff by the same partner in the Forest Academy was completed. The previous records indicate that as a single project, the CRPARP's contribution seemed the highest for capacity building to improve forest management efficiency in comparison to any other projects or initiatives undertaken previously. Information from the BFD showed that 3,664 (3,422 local and 244 foreign) MoEF and BFD officers/staff are being trained on forestry issues under different projects other than the CRPARP and the BFD initiatives that started from 2011 and will continue up to 2019 **(Appendix 7)**. Information from the BFD, about the training programs, also showed that a total of 445 officers and staff (74 percent local and 26 percent foreign trainings) of the BFD and MoEF participated in trainings from both local and foreign institutions, of whom 62 percent are officers (42 percent local and 20 percent foreign trainings) and 38 percent are staff (32 percent local and 6 percent foreign trainings) (**Appendix 8**).

Updating FMP

7. Updating the expired FMP (1994) for 2017–2036, to implement the newly drafted National Forestry Policy of 2016, is at its final stage. It is named as the Forestry Master Plan for Bangladesh 2016. The FMP is composed of seven tasks, of which six tasks were finalized through six national workshops. The draft of the seventh task which, is the FMP is under the process of finalization through the upcoming national workshop in December 2016. However, the respective strategic partner and consultant informed that the updated Forestry Master Plan for Bangladesh 2016 would be submitted to the MoEF by December 2016. It is to be noted that the validity period of the previous FMP (1995–2015) has expired and it will not be able to address the targeted aim of bringing 20 percent area of Bangladesh under forest coverage, including the issues of sustainable forest management, biodiversity conservation, climate change vulnerabilities and ecosystem services, commitments to the international conventions, RS, GIS, and other monitoring systems. It is expected that the updated FMP for Bangladesh would place special emphasis on all the current and emerging forestry issues in line with the National Forestry Policy of 2016.

Number of cases of non-sustainable and illegal use of forest resources

8.   The results indicated that number of beneficiaries going to the forests for resource extraction has been reduced in the hill forest zone to 64.6 percent at the end of the CRPARP, which was 66.2 percent at the baseline. However, the overall scenario indicated that 41.1 percent of the beneficiaries still go to the forests for resource extraction. On average, around 13.79 percent people extract forest resources in a non-sustainable way, 37 percent in partially sustainable way, and 38.6 percent in sustainable way whereas the baseline showed that the number of people collecting forest resources in non-sustainable, partially sustainable, and sustainable ways were 13 percent, 37.9 percent, and 24.2 percent, respectively. The recorded forest offences have reduced to 12.67 offences per beat compared to 13.62 offences per beat at the baseline.

Forest field/camp offices rehabilitated or reconstructed

9.   According to the revised DPP, a total of 76 field/camp offices of the BFD were constructed through the feasibility study conducted by the design, supervision, and monitoring consultant of BETS Consulting Services Ltd. These field offices are spread over 10 forest divisions of the BFD where the CRPARP is being implemented.

Biodiversity Index and Carbon Stock

10.   A total of 77 species were planted in all the forest zones whereas the maximum species richness was found in both the hill forest and coastal forest zones (49 species each). The overall Shannon-Wiener's Diversity Index and Simpson's Diversity Index was 2.8626 and 0.1083, respectively. Besides, the biodiversity status of control plots shows that Shannon-Wiener's Diversity Index is higher for regenerations (3.3142) compared to plantations/trees (3.2945) having higher number of species regenerating (78 species) than trees (61 species).

Conclusion

11.   The project made substantial contribution to Bangladesh's forestry sector by increasing climate resilience through establishing plantations, adopting indigenous plant species for plantations at an increasing rate instead of exotic species, and developing socioeconomic conditions of forest-dependent communities. Raising awareness among the people living adjacent to the forests and practicing the participatory approach for planation maintenance and protection helps attain sustainability of the afforestation programs. Moreover, strengthening the BFD through developing the National Forestry Policy, monitoring guidelines, updating the FMP, training the BFD staff, procuring logistics for RIMS, and constructing forest field offices would increase forest management efficiency. It is also believed that the CRPARP interventions would certainly help achieve the Sustainable Development Goals of the People's Republic of Bangladesh. This project completion and impact assessment report is expected to provide the completion status of the CRPARP interventions and compare the achievement with the baseline values with regard to the PDO and intermediate and additional indicators.

Table 7.1. Major Impacts Made by the CRPARP in Terms of PDO-level Indicators

Sl. No.	Indicators	Baseline Values/Status (2010–2011 to 2012–2013)				During or by Means of CRPARP (2013–2014 to 2015–2016)			
		Development project, foreign aid	Development project, GoB	Revenue	Total	Development project, foreign aid	Development project, GoB	Revenue	Total
1	Area restored or re/afforested (Annual afforestation rate, ha/yr)	1,986 (27%)	5,339 (72%)	85 (1%)	7,410 (100%)	8,181 (92%)	486 (6%)	156 (2%)	8,822 (100%)

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Sl. No.	Indicators	Baseline Values/Status (2010–2011 to 2012–2013)	During or by Means of CRPARP (2013–2014 to 2015–2016)
			CRPARP: 17,500 ha (see appendices 1 and 2)
2	Forest users trained	n.a.	EADS: 17,000 (PBSA - 15,249, FDG - 1751). AF: 6,000 (Vegetable cultivation, poultry rearing and AIGA), 916 (Leadership Development and Financial Management)
	Forest users trained - Female (sub-indicator)	n.a.	EADS: 4,670 AF: 5,160 (Vegetable cultivation, poultry rearing), 2,045 (AIGA), 625 (Leadership Development and Financial Management).
	Forest users trained - Ethnic minority/indigenous people (sub-indicator)	n.a.	Trained by EADS: 336 (target - 1,500) Trained by AF: 321 (target - 321)
3	Increased household income of beneficiaries participating in alternative income generating activities	Annual household income: BDT 86,520 ± 3,343 for FDG members	Annual household income: BDT 117,491 ± 4,429 for FDG members
4	Reforms in forest policy, legislation, or other regulations supported	Major policy reforms • Social Forestry Rule, 2004 (amended in 2010 and 2011) • Environment Court Act 2010 • Revised National Conservation Act, 2010 • Forest Transit Rule, 2011 • Bangladesh Bio-safety Rules, 2012 • Bangladesh Wildlife (Conservation and Security) Act, 2012 • Tree Conservation Act (Draft) 2012 • Bangladesh REDD+ Readiness Roadmap, 2012 • Sawmill Rules-2012	Policy reforms under the CRPARP • Updated Forestry Master Plan for Bangladesh 2016 (Draft) • National Forestry Policy of 2016 (Draft) • Forest Resource Monitoring and Assessment Protocol Policy reforms outside the CRPARP • Bangladesh Biological Diversity Act, 2016 • Ecologically Critical Area Management Rules, 2013 • The Brick Manufacture and Brick Kiln Installation (Control) Act, 2013 • Ecologically Critical Areas (Draft) 2016 • National Conservation Strategy (Draft) 2016 • Ecologically Critical Areas Act 2016 • Protected Area rules (Draft) 2016 Draft Protected Areas (PAs) Management Plans for Wildlife Sanctuaries and National Parks
5	Government institutions provided with capacity	3,664 MoEF and BFD officers/staff are being trained on forestry issues under different projects other than the CRPARP and the BFD initiatives that started from 2011 and will	EADS 380 in Forest Academy and 464 at local and field levels

Sl. No.	Indicators	Baseline Values/Status (2010–2011 to 2012–2013)	During or by Means of CRPARP (2013–2014 to 2015–2016)
	building to improve management of forest resources	continue up to 2019. The training programs included one-day workshop, 1- to 10-day short study tour, 1- to 30-day short training, 1- to 3-month certificate diploma, 10-month postgraduate diploma and 1 to 2 years master's degree courses	AGRER-DTCL-HCL in overseas 56 BFD and MoEF officers/staff AGRER-DTCL-HCL in RIMS 16 BFD officers 3 short training courses
6	Direct project beneficiaries	n.a.	Target: 46,000 Achieved: 28,371 (PBSA), 6,000 (FDG), 93,391 (Labor as of November 16)
	Female beneficiaries (sub-indicator)	n.a.	Target: 30% Achieved: 22% (as of September 16)

Table 7.2. Major Impacts Made by the CRPARP in Terms of Intermediate Indicators

Sl. No.	Intermediate Indicators	Baseline Values/Status (2010–2011 to 2012–2013)				During or by Means of CRPARP (2013–2014 to 2015–2016)			
		Development project, foreign aid	Development project, GoB	Revenue	Total	Development project, foreign aid	Development project, GoB	Revenue	Total
1	Increase in forest coverage (ha or km) for strip plantation in target areas	381 (28%)	810 (59%)	172 (13%)	1,364 (100%)	732 (92%)	11 (2%)	60 (6%)	802 (100%)
						CRPARP: *Golpata* - 943 km, strip - 1,057 km			
2	Community jobs (million days) created through re/afforestation program	n.a.				Target: 3.6 Re/afforestation labor: 2.56 (September 2016)			
3	At least 200 community groups have been targeted by the project through capacity building program and small grant funding, with at least 80% of their members being poor and at least 50% women	n.a.				FDG formed: 200 Beneficiaries: Total - 6,000, female - 5,160 (86% of total), male - 840, ethnic - 321 UF formed: 55 UCF formed: 55 CPG formed: 21 Project staff training: 56 (local), 42 (foreign) COV training: 200 Exchange visit: 65 Other activities: Awareness campaign, publication, AIGAs training, MSRLF, UF registration, value chain, LSP, ICS, demo plots, plantation, input support, and so on			
4	Guidelines for program monitoring developed	n.a.				Forest Resource Monitoring and Assessment Protocol developed			
5	Forestry Master Plan Revised	Bangladesh Forest Department (BFD) had developed an FMP in 1994 for 1995–2015 with the aim of covering 20% lands of the country to forest coverage. Many				Updated Forestry Master Plan for Bangladesh 2016 (Draft) under the CRPARP is at its final stage of preparation which would be submitted to the MoEF by December 2016 for approval.			

Sl. No.	Intermediate Indicators	Baseline Values/Status (2010–2011 to 2012–2013)	During or by Means of CRPARP (2013–2014 to 2015–2016)
		challenges identified in the 1994 FMP and emerging new challenges in the Bangladesh forestry sector are yet to be addressed.	The plan is prepared in line with the newly prepared National Forestry Policy of 2016 (Draft).
6	The number of cases of non-sustainable and illegal use of forest resources has been reduced by 30% in and around the project area through project interventions.	Number of offences per beat at selected beats Overall - 13.62 Southern region - 19.44 Southeastern region - 13.62	Number of offences per beat at selected beats Overall - 12.67 Southern region - 4.8 Southeastern region - 14
		Forest dependency by income from forests Hill forest zone - BDT 12,628 Coastal forest zone - BDT 1,662 Social forest zone - BDT 418 Overall dependency - BDT 7,099	Forest dependency by income from forests Hill forest zone - BDT 8,022; Coastal forest zone - BDT 5,194; Social forest zone - BDT 681; Overall dependency - BDT 6,086.
		Forest dependency by number of extractor Hill forest zone - 66.2% Coastal forest zone - 13.7% Social forestry zone - 4.5% Overall dependency - 42.2%	Forest dependency by number of extractor Hill forest zone - 64.6% Coastal forest zone - 21.2% Social forestry zone - 6.8% Overall dependency - 41.1%
		Forest Resource Extraction 13.7 % non-sustainable way; 40.4 % partially sustainable way; 26.3 % in sustainable way	Forest Resource Extraction 13.79% non-sustainable way; 37% partially sustainable way; 36.8 % in sustainable way
7	Number of forest field offices rehabilitated/reconstructed	n.a.	76 BFD field/camp offices of 3 sizes grouped under 10 packages have been constructed over 10 target forest divisions.

Table 7.3. Major Impacts Made by the CRPARP in Terms of Additional Indicators

Sl. No.	Intermediate Indicators	Baseline Values/Status (2010–2011 to 2012–2013)		During or by Means of CRPARP (2013–2014 to 2015–2016)
1	Biodiversity indexes	Control[a]	Trees >1.5 m height: SDI[b] = 3.2945, SiDI = 0.059 Regeneration: SDI = 3.3142, SiDI = 0.056	Plantations: SDI[b] = 2.8626, SiDI = 0.1083 Regeneration: SDI = 3.4182, SiDI = 0.0566
		[c] Outside CRPARP	Plantations: SDI = 2.0887, SiDI = 0.1835 Regeneration: SDI = 2.385; SiDI = 0.089	
2	Basal area of trees >1.5 m height (m²/ha)	Control	0.6661	Overall: 0.0016, hill forest zone: 0.002, coastal forest zone: 0.002, social forest zone: 0.037
		Outside CRPARP	n.a.	
3	Aboveground biomass (t/ha)	Control	3.4939 (plants >1.5 m height)	Plantations:1.073, Regeneration: 0.296
		Outside CRPARP	n.a.	
4	Aboveground carbon (AGC) (tC/ha)	Control	1.7469 (plants >1.5 m height) 0.1600 (plants <1.5 m height)	0.5365 (plantation) 0.148 (regeneration)
		Outside CRPARP	0.5573 (plantations) 0.1369 (regenerations)	
5	Below-ground carbon (BGC)[d] (tC/ha) [20% of	Control	0.3493 (plants >1.5 m height) 0.0320 (plants <1.5 m height)	0.1073 (plantation) 0.0296 (regeneration)
		Outside	0.1115 (plantations)	

Sl. No.	Intermediate Indicators	Baseline Values/Status (2010–2011 to 2012–2013)		During or by Means of CRPARP (2013–2014 to 2015–2016)
	AGC]	CRPARP	0.0274 (regenerations)	
6	Soil carbon (tC/ha) (SC)	Control	33.36	48.57
		Outside CRPARP	47.11	
7	Total carbon (tC/ha) [AGC + BGC + SC]	Control	35.6482	49.3914
		Outside CRPARP	47.9431	
8	Number of seedlings planted per unit area	Control	n.a.	Block: 2,500/ha Mangrove: 4,400/ha Strip: 1,000/km Mound: 1,600/ha
		Outside CRPARP	Block - 2,500/ha Mangrove - 4,400/ha, strip - 1,000/km	
9	Number of seedlings survived per ha (%)	Control	n.a.	Core/buffer: 95% Mangrove: 91% Mound: 92% *Jhau*: 96% Non-mangrove: 87% Enrichment: 98% *Golpata*: 97% Strip: 95%
		Outside CRPARP	Block - Overall: 83% Core/buffer: 91% Mangrove: 74% Mound/*Jhau*/non-mangrove: 81% Strip: 96%	
10	No. of tree species grown/planted (Exotic and native)	Control	4 Exotic/naturalized and 57 native species	7 exotic/naturalized and 70 native species
		Outside CRPARP	11 Exotic/naturalized and 27 native species	
11	Density of exotic and native tree seedling/ha in plantations	Control	n.a.	Exotic species: 860 Native species: 1,230
		Outside CRPARP	Exotic seedlings: 1,416 native seedlings: 888	
12	Tree species regenerating naturally (Number)	Control	78	95
		Outside CRPARP	16	
13	Number of seedling regenerating (seedling/ha)	Control	3,802	4,392
		Outside CRPARP	2,824	

Note: a. Control plots adjacent to the afforested plantations.

b. SDI = Shannon-Wiener's Diversity Index; SiDI = Simpson's Dominance Index; n.a. = Not applicable.

c. Afforested area in the forest divisions outside the CRPARP.

d. Below-ground carbon is estimated as 20 percent of AGB following Santantonio, D., R. K. Hermann, and W. S. Overton. 1977. "Root Biomass Studies in Forest Ecosystems." *Pedobiologia* 17: 1–31.

Grantee's and Implementing Agencies' Comments to the World Bank ICR

12.   The draft final ICR prepared by the World Bank is a realistic, well written valuable document for CRPAR Project. We agree with almost all the contents but like to mention few points for review:

Bangladesh Forest Department Part:

1.   Clause 63. CRPAR Project plantations involved 28,465 participants. They all are not from AF's 6000 households.

2.   Clause 66. The project plantations were established during three plantation periods (FY 2013 14, FY 2014-15 and FY 2015-16), not during two plantation periods.

3. Page 30. Biodiversity improved. In hill forest zone, the Short Rotation Plantations under CRPAR Project constituted 27 to 44% exotic species mainly Akashmoni as reported in table 8 of the ICR prepared by Eusuf and Associates. The Independent Monitoring & Evaluation Team.

4. Page 37 & 38 (Para 4). As per Social Forestry Rule 2004, Rotation for Social Forestry Plantations e.g. Woodlot, Agroforestry, strip etc. plantations would be 10 years, not 15 years.

5. The disburse and expenditure incurred amount as shown in the ICR has been depicted properly as per project documents.

Arannayk Foundation (AF) Part

1. Under clause 45, line 6 it says that the third party monitoring team, as well as the final review undertaken by the project, participant selection procedures were not followed properly during the delivery on the ground. This is not correct. The Third Party Monitoring team came up with a figure that households having 60% of their income were supposed to be selected by the AF. In fact, there was no such figure in the manual. The AF followed the procedure as described in manual 3. There is no deviation in households' selection procedures from the approved selection procedures in Manual 3. How the AF selected climate vulnerable villages and forest dependent households are described as annexure 1.

2. Under clause 50, line 11, it says that the AF has put through a proposal of US$ 2.0 million to USAID for expansion of alternative livelihood support activities. In fact the correct figure is US$ 1.7 million dollars.

3. Under clause 63, **Community jobs and capacity building** it is stated that 'A total of 28,465 participating 6,000 households were selected under 836 Benefit Sharing Agreements of which 73 percent were signed by males and 27 percent by females.' This sentence is not clear. I am afraid something is missing here. It may be revisited.

4. Under clause 67, line 15, it will be seedling, which is written as seeding.

5. Under clause 70, line 7, it says that The LPSs were earning an income of BDT 5,500-22,000. As per our latest survey, it will be BDT 5,500 to 26,500 per month at the time of project closure.

6. Under clause 85, line 12, it says that 'FDG members managed to establish BDT 13.3 (15,261,730) million participatory savings and MRSLF totaling BDT 77.5 (81.0) million'. The figures may be corrected as 'FDG members managed to establish BDT 15,26 million participatory savings and MRSLF totaling BDT 81.00 million.

7. In annex 2, table 2.1, the figures in parenthesis may be corrected as highlighted in Table 7.4 below:

Table 7.4. Updated data under Component 2

21	Participatory savings by FDG members	BDT		(13278296) **1,5261,730**	Mostly depositing @100 Taka per month
22	MRSLF loan funds	Million BDT		(77.5) **81.0**	BDT 13.2 M from savings, BDT 60 M project grant and BDT 4.3 M from interest income
23	Distribution of MRSLF loans	BDT		(95,181,000) **109,080,000**	(92) 94% FDG members received RLF once. Around (1726)2144 participants have received MRSLF

				loan for 2nd time and 155 households received loan for third time. Loan size ranged from BDT 5000-(25000) **30,000** for 12
	Number		(7274) **7928**	months @ 5-10% interest/service charge. Recovery rate is 100%
28	Development of Local Service Provider (LSP) of Value Chain Approach		(92) **133**	Started from 2nd year of the project in 22 pilot villages and started in rest of the villages after recommendations from MTR mission

Village and household selection procedures adopted by the AF

Selection of Climate Vulnerable Villages

13.   While the plantation activities of CRPARP (Component-1) are implemented in over 800 villages and involving around 46,000 beneficiaries, the ALSFC component of CRPARP is implemented in only 200 selected villages and involving only 6,000 households.

14.   The 200 villages were selected from the nine districts (Cox's Bazar, Chittagong, Feni, Noakhali, Lakshmipur, Bhola, Barisal, Patuakhali and Barguna) based on the following criteria:
   a)   Proximity to proposed afforestation/reforestation sites,
   b)   Proximity to natural forests,
   c)   Level of current and potential impacts of climate change,
   d)   Size of area to be afforested/reforested
   e)   Level of poverty and
   f)   Level of disturbance on forest.

15.   First, the planned plantation areas as per the list provided by the concerned Divisional Forest Officers (DFOs) were identified with the help of the local Bangladesh Forest Department (BFD) officials - Range Officers and Beat Officers. Then the villages surrounding each of the planned plantation areas were assessed with the help of knowledgeable local people and BFD officials (key informants) using a tool that assigned a numeric score to each village based on the criteria mentioned above and the highest scoring village near the plantation area was provisionally selected.

Table7.5. Criteria for village selection for the ALSFC component

SL. #	Criteria	Definition	Score
1	Proximity to proposed afforestation/reforestation site	0 – 2 km	3
		2 – 4 km	2
		4 – 5 km	1
		> 5 km	0
2	Proximity to natural forest (important indicator for defining forest dependent communities)	0 – 2 km	3
		2 – 4 km	2
		4 – 5 km	1
		> 5 km	0
3		Very high	4
		High	3

SL. #	Criteria	Definition	Score
	Level of current and potential impacts of climate change (occurrence of soil erosion/landslide, water retention, probability of tidal surges, salinity)	Medium	2
		Low	1
4	Size of area to be afforested/reforested (the minimum size should not be less than 10 ha to include 30 beneficiaries for ALSFC component)	> 50 ha	3
		20 – 40 ha	2
		10 – 20 ha	1
		<10 ha	0
5	Level of poverty (based on the most updated statistical data such as Poverty Map of Bangladesh of 2009 and Union Parishad data on village poverty level)	Very high	4
		High	3
		Moderate	2
		Low	1
6	Level/risk of disturbance	Very high	4
		High	3
		Medium	2
		Low	1
	Total score	(Sum of all scores)	

16. The list of the provisionally selected villages within a Forest Division was reviewed and finalized in a meeting involving the local BFD officials and CRPARP-ALSFC project staff under the leadership of the respective DFO.

Selection of poor forest dependent households

17. The forest dependent poor households were selected from the poor and extreme poor households in the selected villages through a rigorous process involving three steps. In the first step, all the households of a selected village were classified into four well-being groups (extreme poor, poor, middle income and rich) through participatory rural appraisal (PRA) exercise for a Wealth Ranking Analysis.

18. Then the extreme poor and poor households were further investigated through a questionnaire-based household survey and were ranked with the help of a tool that assigned a numeric score to each household based on its level of poverty, vulnerability and forest dependence.

Table 7.6. Criteria for beneficiaries' selection for the ALSFC component

	Criteria	Definition	Score
1	Demographic/social	Indigenous people household	3
		women headed household	4
		disabled/vulnerable women headed household	4
		Neither of above	0
2	Household income per person (using monthly household expenditures as a proxy)	More than 1,500 BDT and less than 3,000 BDT	1
		800-1500 BDT	2
		Less than 800 BDT	3
		More than 3,000 BDT	0
3	Homestead land	Owned	1
		Encroached or belongs to relatives	2
		Leased land	3
		Have other land as well	0
4	Housing	Permanent (wood, pacca)	1

	Criteria	Definition	Score
		Semi temporary (made of bamboo or wood with tin roof and semi-pucca floor)	2
		Temporary (made of mud, bamboo or palm leaf with kacha floor)	3
		Wood, brick	0
5	Access to drinking water	From tube well	1
		From pond	2
		From other unstable sources	3
		Have own water supply	0
6	Sanitary facilities	Permanent latrine	1
		Temporary latrine	2
		No latrine	3
		Have full scale toilet	0
7	Household assets (the value of a set of the most important assets, including land, livestock, productive assets, appliances, and non-productive assets	More than 2 mln taka	1
		1-2 million taka	2
		Less than 1mln taka	3
		More than 3 mln taka	0
8	Forest dependency (% of household income from forest)	More than 50%	2
		More than 70%	4
		90-100%	6
		Less than 50%	0
	Total Score	(Sum of all scores)	

19.   The tool assigned higher scores to the extreme poor, female-headed, ethnic minorities and highly forest dependent households. The list of the 30 candidate (highest scoring) households were then reviewed and finalized in a village meeting involving the village leaders and Union Council representatives.

20.   Lobbies to select non-eligible households were addressed by explaining the selection criteria and process, and the objectives of this project to the respective lobbyists. The 6000 selected households include a total of 1634 female headed households and 321 households from indigenous communities.

21.   After being selected, the AF made an in-depth socio-economic survey of each household using a semi-structured questionnaire.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

Annex 9. List of Supporting Documents

1. Aide Memories and ISRs

2. Assessment and Forest Resources Management Information system in Bangladesh Forest Department

3. Component 2 Operating Manuals: (a) Monitoring and Evaluation Plan for Alternative Livelihoods to Support Forest Communities; (b) Mutual Rotating Savings and Loan Fund of Forest Dependent Groups; (c) Guidelines of Institution and Capacity Building of Forest Dependent Groups; and (d) Sustainability Strategy and Exist Plan

4. Country Assistance Strategy 2011–2014 (Report No. 54615-BD)

5. Country Partnership Framework 2016–2020 (Report No. 103723-BD)

6. Fiduciary reports of the World Bank

7. Final ICR by Eusuf and Associates on behalf of the Grantee - December 2016

8. Financing Agreement

9. Forest Master Plan Draft Final

10. Grant Agreement (BCCRF Grant No TF014026)

11. Half-yearly progress monitoring reports

12. National Forest Policy Draft Final

13. Project Appraisal Document (Report No: 74600-BD)

14. Project Implementation Manual – Volumes I, II and III

15. Restructuring Project Papers (Report No.: RES25478)

16. Technical study for mapping of potential green belt zone in the coastal region of Bangladesh

17. Technical Study to Strengthen Forest Resources Monitoring and Assessment and Forest Resources Management Information System in Bangladesh Forest Department

18. Technical Study for Land Use Mapping, Assessment and Monitoring of Proposed Afforestation and Reforestation Sites

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