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Report No: PAD2571

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED CREDIT

FROM THE IDA SCALE-UP WINDOW FACILITY

IN THE AMOUNT OF US$120 MILLION

TO THE

PEOPLE'S REPUBLIC OF BANGLADESH

FOR A

CLIMATE-SMART AGRICULTURE AND WATER MANAGEMENT PROJECT

February 11, 2021

Agriculture And Food Global Practice
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective January 31, 2021)

Currency Unit =	Bangladesh Taka (BDT)
BDT84.73 =	US$1

FISCAL YEAR
July 1 – June 30

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
ADM	Adaptive Delta Management
ADPC	Asian Disaster Preparedness Centre
AIIB	Asian Infrastructure Investment Bank
BACS	Budget and Accounts Classification System
BCCSAP	Bangladesh Climate Change Strategy and Adaptation Plan
BCR	Benefit Cost Ratio
BDP	Bangladesh Delta Plan
BDT	Bangladesh Taka
BWBD	Bangladesh Water Development Board
CAG	Comptroller and Auditor General
CBOs	Community-Based Organizations
CDD	Community Driven Development
CEGIS	Center for Environmental and Geographic Information Services
CERIP	Contingent Emergency Response Implementation Plan
CIAT	International Center for Tropical Agriculture
CONTASA	Convertible Taka Special Account
COVID-19	Coronavirus Disease
CPF	Country Partnership Framework
CPTU	Central Procurement Technical Unit
CSA	Climate-Smart Agriculture
CSAWMP	Climate-Smart Agriculture and Water Management Project
DA	Designated Account
DAE	Department of Agricultural Extension
DoE	Department of Environment
DoF	Department of Fisheries
DPPs	Development Project Proposals
DSSI	Debt Service Suspension Initiative
EA	Environment Assessment
e-GP	e-Government Procurement
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plans
ENPV	Economic Net Present Value
ERD	Economic Relations Division
ERR	Economic Rates of Return
ESMF	Environment and Social Management Framework
ESMP	Environment and Social Management Plan
Ex-ACT	Ex-Ante Carbon-balance Tool
FAO	Food and Agriculture Organization
FAPAD	Foreign Aided Projects Audit Directorate
FCD	Flood Control and Drainage
FCDI	Flood Control Drainage and Irrigation
CSFFS	Climate-Smart Farmer Field Schools
FM	Financial Management
FNPV	Financial Net Present Value
FRR	Financial Rates of Return

FYP	Five Year Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoB	Government of Bangladesh
GPN	General Procurement Notice
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
iBAS++	Integrated Budgeting and Accounting System
IDA	International Development Association
IEG	Independent Evaluation Group
IFR	Interim Financial Report
IMF	International Monetary Fund
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IPF	Investment Project Financing
IRM	Immediate Response Mechanism
IUFR	Interim Unaudited Financial Report
IVR	Interactive Voice Response
JICA	Japan International Corporation Agency
LCS	Labor Contracting Societies
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MIS	Management Information System
MoA	Ministry of Agriculture
MoFL	Ministry of Fisheries and Livestock
MOM	Management of Operation and Maintenance
MOUs	Memorandum of Understandings
MoWR	Ministry of Water Resources
MSME	Micro, Small, and Medium Enterprise
MTD	Model Tender Document
NAPA	National Adaptation Program of Action
NATP	National Agricultural Technology Program
NEMAP	National Environment Management Action Plan
NPV	Net Present Value
OCAG	Office of Comptroller and Auditor General
OCWM	Office of Chief, Water Management
O&M	Operation and Maintenance
PCU	Project Coordination Unit
PD	Project Director
PDO	Project Development Objective
PIC	Project Implementation Committee
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PLR	Performance and Learning Review
PPSD	Project Procurement Strategy for Development
PSC	Project Steering Committee
PSM	Participatory Scheme Management
PSW	Private Sector Window
PWMR	Participatory Water Management Regulations
RAP	Resettlement Action Plan

RPF	Resettlement Policy Framework
RMG	Ready Made Garment
SCD	Systematic Country Diagnostic
SCM	Suggestions and Complaints Mechanism
SDG	Sustainable Development Goal
SMF	Social Management Framework
SMP	Social Management Plan
SORT	Systematic Operations Risk-Rating Tool
SPD	Standard Procurement Documents
STEP	Systematic Tracking of Exchanges in Procurement
TOC	Theory of Change
TOR	Terms of Reference
UNDB	United Nations Development Business
US$	United States Dollar
WBG	World Bank Group
WMIP	Water Management Improvement Project
WMO	Water Management Organization

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Bangladesh	Climate-Smart Agriculture and Water Management Project	
Project ID	**Financing Instrument**	**Environmental Assessment Category**
P161534	Investment Project Financing	B-Partial Assessment

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[✓] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	[ ] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
09-Mar-2021	30-Jun-2026

Bank/IFC Collaboration

No

Proposed Development Objective(s)

To enhance climate resilience and productivity of irrigated agriculture and fisheries in targeted schemes

Components

Component Name	Cost (US$, millions)

Improved Climate Resilience of Flood Control, Drainage and Irrigation Infrastructure Systems	124.82
Climate-Smart Agriculture and Fisheries Production and Marketing	19.71
Project Management Support	10.78
Contingency Emergency Response	0.00

Organizations

Borrower:	People's Republic of Bangladesh
Implementing Agency:	Bangladesh Water Development Board Department of Agricultural Extension Department of Fisheries

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	155.31
Total Financing	155.31
of which IBRD/IDA	120.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	120.00
IDA Credit	120.00

Non-World Bank Group Financing

Counterpart Funding	35.31
Borrower/Recipient	35.31

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Bangladesh	120.00	0.00	0.00	120.00

Scale-up Facility (SUF)	120.00	0.00	0.00	120.00
Total	**120.00**	**0.00**	**0.00**	**120.00**

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2021	2022	2023	2024	2025	2026
Annual	0.81	12.40	20.69	26.67	29.85	29.59
Cumulative	0.81	13.21	33.90	60.56	90.41	120.00

INSTITUTIONAL DATA

Practice Area (Lead)

Agriculture and Food

Contributing Practice Areas

Water

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	Substantial
9. Other	
10. Overall	Substantial

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Performance Standards for Private Sector Activities OP/BP 4.03		✓
Natural Habitats OP/BP 4.04		✓
Forests OP/BP 4.36		✓
Pest Management OP 4.09	✓	
Physical Cultural Resources OP/BP 4.11		✓
Indigenous Peoples OP/BP 4.10	✓	
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37		✓
Projects on International Waterways OP/BP 7.50	✓	
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

Section I Part A(1)(a): The Recipient shall, (a) by no later than two (2) months after the Effective Date, establish, and maintain throughout the period of Project implementation, a Project Steering Committee ("PSC"), which committee shall be chaired by the Senior Secretary/Secretary of MoWR, and have representation from the MoWR, MoA, MoFL and other ministries and agencies, acceptable to the Association, to provide overall coordination and policy guidance during Project implementation and review overall implementation progress periodically.

Sections and Description

Section I Part A(1)(b): The Recipient shall by no later than two (2) months after the Effective Date, establish, and maintain throughout the period of Project implementation, a Project Implementation Committee ("PIC"), which committee shall be chaired by the Directors General of the BWDB, DAE and DoF on a rotational basis, to oversee

the technical functions under the Project, including reviewing and integrating work plans and budgets, and reconciling tensions between crop and aquaculture land uses under schemes.

Sections and Description

Section I Part C (1)(a): The Recipient shall, (a) by no later than two (2) months after the Effectiveness Date, approve and adopt a Project Implementation Manual ("PIM") in a manner and substance satisfactory to the Association, and thereafter carry out the Project in accordance with the provision of the PIM, which PIM shall include, inter alia: (i) the definition of the contours of the Project activities, including results framework and overall budget; (ii) the Project implementation arrangements, including the allocation of functions and responsibilities the PSC, PIC, PCU and PIUs; (iii) the Project's financial management and procurement requirements; and (iv) the Project's monitoring and evaluation, and reporting requirements, and pro-forma Progress Reports; and (b) refrain from materially and/or substantially amending, revising, waiving, voiding, suspending or abrogating, any provision of the PIM, whether in whole or in part, without the prior written concurrence of the Association.

Sections and Description

Section I Part A(1)(c): The Recipient shall, by no later than one (1) month after the Effective Date, establish, and maintain throughout the period of Project implementation, a Project Coordination Unit ("PCU") within BWDB, which unit shall be provided with competent, experienced and qualified staff, including procurement, environment safeguards, social safeguards, financial management and monitoring and evaluation experts, in sufficient numbers and under terms of reference, qualifications and experience acceptable to the Association, and vested with powers, financial resources, functions and competences, acceptable to the Association, to serve as the Secretariat of the PSC, and to carry out the overall coordination across all Project activities.

Sections and Description

Section I Part A(1)(d): The Recipient shall, by no later than one (1) month after the Effective Date, establish, and maintain throughout the period of Project implementation, Project Implementation Units ("PIUs"), one each within DAE and DoF, each with a financial management specialist, and by no later than two (2) months after the Effective Date, provide each PIU within DAE and DoF, with two accounts officers, and with other competent, experienced and qualified staff including, on an as needed basis, procurement, monitoring and evaluation experts; in sufficient numbers and under terms of reference, qualifications and experience acceptable to the Association, and vested with powers, financial resources, functions and competences, acceptable to the Association, to carry out the day-to-day implementation of Project activities and coordinate with the PCU.

Sections and Description

Section I Part D (1): The Recipient shall ensure that (a) the Project is carried out with due regard to appropriate health, safety, social, and environmental practices and standards, and in accordance with the Safeguards Instruments; (b) for each activity under the Project for which the EMF, SMF or the RPF provide for the preparation of an ESIA, and/or a ESMP, and/or a RAP: (i) proceed to have such ESIA, and/or ESMP and/or RAP as appropriate: (A) prepared and disclosed in accordance with the EMF, the SMF and the RPF, respectively; (B) consulted upon adequately with people affected by the Project as per the EMF, the SMF and the RPF, respectively, and submitted to the Association for review and approval; and (C) thereafter adopted, prior to implementation of the activity; and (ii) take such measures as shall be necessary or appropriate to ensure compliance with the requirements of such ESIA, and/or ESMP and/or RAP in a manner satisfactory to the Association; (c) all measures are taken to implement the RAPs in a manner and timeframe satisfactory to the Association. To this end, the Recipient shall ensure that: (i) funds are made available to cover all the costs of implementing the RAPs. (ii)

prior to carrying out activities which involve displacement, Affected Persons shall be compensated at full replacement cost, resettled and provided with assistance in accordance with the RAPs, as applicable; and (iii) the implementation, monitoring and evaluation of such RAPs is completed and reported in a manner satisfactory to the Association.

Sections and Description

Section I Part E (1): 1. In order to ensure the proper implementation of contingent emergency response activities under Part 4 of the Project ("Contingent Emergency Response Part"), the Recipient shall ensure that: (a) a manual ("CERC Manual") is prepared and adopted in form and substance acceptable to the Association, which shall set forth detailed implementation arrangements for the Contingent Emergency Response Part, including: (i) any structures or institutional arrangements for coordinating and implementing the Contingent Emergency Response Part; (ii) specific activities which may be included in the Contingent Emergency Response Part, Eligible Expenditures required therefor ("Emergency Expenditures"), and any procedures for such inclusion; (iii) financial management arrangements for the Contingent Emergency Response Part; (iv) procurement methods and procedures for the Contingent Emergency Response Part; (v) documentation required for withdrawals of Financing amounts to finance Emergency Expenditures; (vi) a description of the environmental and social assessment and management arrangements for the Contingent Emergency Response Part; and (vii) a template Emergency Action Plan; (b) the Emergency Action Plan is prepared and adopted in form and substance acceptable to the Association; (c) the Emergency Response Part is carried out in accordance with the CERC Manual and the Emergency Action Plan; provided, however, that in the event of any inconsistency between the provisions of the CERC Manual or the Emergency Action Plan and this Agreement, the provisions of this Agreement shall prevail; and (d) neither the CERC Manual or the Emergency Action Plan is amended, suspended, abrogated, repealed or waived without the prior written approval by the Association.
2. The Recipient shall ensure that the structures and arrangements referred to in the CERC Manual are maintained throughout the implementation of the Contingent Emergency Response Part, with adequate staff and resources satisfactory to Association.
3. The Recipient shall ensure that: (a) the environmental and social instruments required for the Contingent Emergency Response Part are prepared, disclosed and adopted in accordance with the CERC Manual, and in form and substance acceptable to the Association; and (b) the Contingent Emergency Response Part is carried out in accordance with the environmental and social instruments in a manner acceptable to the Association.
4. Activities under the Contingency Emergency Response Part shall be undertaken only after an Eligible Crisis or Emergency has occurred.

Sections and Description

Section I Part D (1)(b): The Recipient shall ensure that for each activity under the Project for which the EMF, SMF or the RPF provide for the preparation of an ESIA, and/or a ESMP, and/or a RAP: (i) proceed to have such ESIA, and/or ESMP and/or RAP as appropriate: (A) prepared and disclosed in accordance with the EMF, the SMF and the RPF, respectively; (B) consulted upon adequately with people affected by the Project as per the EMF, the SMF and the RPF, respectively, and submitted to the Association for review and approval; and (C) thereafter adopted, prior to implementation of the activity; and (ii) take such measures as shall be necessary or appropriate to ensure compliance with the requirements of such ESIA, and/or ESMP and/or RAP in a manner satisfactory to the Association.

Sections and Description

Section I Part D (1)(c): The Recipient shall ensure that all measures are taken to implement the RAPs in a manner and timeframe satisfactory to the Association. To this end, the Recipient shall ensure that: (i) funds are made available to cover all the costs of implementing the RAPs; (ii) prior to carrying out activities which involve displacement, Affected Persons shall be compensated at full replacement cost, resettled and provided with assistance in accordance with the RAPs, as applicable; and (iii) the implementation, monitoring and evaluation of such RAPs is completed and reported in a manner satisfactory to the Association.

Sections and Description

Section I Part D (1)(d): The Recipient shall ensure that for each activity under the Project for which the TPDF provides for the preparation of an Tribal Peoples Development Plan, the Recipient shall: (a) prior to the carrying out of any said activity, prepare and/or cause to be prepared and furnish to the Association, a Tribal Peoples Development Plan, in accordance with the TPDF and satisfactory to the Association; and (b) thereafter, adopt and implement said Tribal Peoples Development Plan in accordance with its terms and in a manner satisfactory to the Association.

Conditions

Type	Description
Disbursement	Section III Part B(1): Notwithstanding the provisions of Part A above, no withdrawal shall be made for Emergency Expenditures under Category (4), unless and until all of the following conditions have been met in respect of said expenditures: (a) (i) the Recipient has determined that an Eligible Crisis or Emergency has occurred, and has furnished to the Association a request to withdraw Financing amounts under Category (4); and (ii) the Association has agreed with such determination, accepted said request and notified the Recipient thereof; and (b) the Recipient has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Association.

I. STRATEGIC CONTEXT

A. Country Context

1. **Bangladesh has made rapid social and economic progress in recent decades, reaching lower-middle income status by 2015.** Gross domestic product (GDP) growth averaged close to 6 percent annually since 2000 and, according to official estimates, accelerated to over 8 percent in FY19. Strong labor market gains contributed to a sharp decline in poverty, with the national poverty rate falling from 48.9 to 24.3 percent between 2000 and 2016, while extreme poverty declined from 34.3 to 12.9 percent.[1] However, the pace of poverty reduction slowed in recent years even as growth accelerated, particularly in urban areas and in the west of the country. Similarly, the progress on shared prosperity slowed between 2010 and 2016 after a decade of improvements, with annual consumption growth of the bottom 40 percent trailing that of the overall population (1.2 versus 1.6 percent). Bangladesh entered the COVID-19 crisis with a relatively strong macroeconomic position. Garment exports and remittances narrowed the external deficit in recent years and international reserves were adequate at the end of April 2020 at US$32.9 billion, equivalent to six months of imports. While tax collections are amongst the lowest in the world, under-execution of the budget has contained the fiscal deficit, which has been below 5 percent of GDP since FY01. As a result, public debt is low and stood at 33.7 percent of GDP at the end of FY19. A key economic vulnerability is in the banking sector where the non-performing loan (NPL) ratio is high at 9.3 percent of outstanding loans in December 2019, and is underestimated considering significant under-provisioning, regulatory forbearance, and gaps in the legal framework.

2. **Growth declined sharply as the COVID-19 pandemic brought about major disruptions to economic activity.** In the first half of FY20 (July to December), growth decelerated as slower global trade and deteriorating external competitiveness lowered exports and tighter access to finance constrained private investment growth. With declining ready-made garment (RMG) orders, exports declined by 5.8 percent year-over-year (y-o-y) during this period. A sharp contraction in capital goods imports (3.4 percent, y-o-y) suggests private investment also declined. Growth during the first half of the year was primarily supported by remittance-fueled private consumption. The initial phase of the pandemic in early 2020 disrupted the supply of intermediate goods from China, reducing manufacturing output. As the pandemic intensified abroad, export orders from Europe and the United States declined precipitously and an estimated US$3.2 billion in RMG orders were cancelled or suspended.[2] The government implemented a national shutdown from March 26 to May 30 to control an accelerating domestic outbreak of the virus. Control measures resulted in a sudden stop of many components of the service and industrial sectors. Remittance inflows declined by 23.6 percent y-o-y in April 2020 and exports declined by 82.9 percent in the same period. In FY19, inflation had remained modest at an average of 5.5 percent, primarily driven by a rise in non-food prices. Demand for food surged with precautionary purchases ahead of the national lockdown but has eased more recently as government food distribution programs were implemented. Overall inflation reached 5.4 percent y-o-y by the end of May 2020.

3. **COVID-19 has darkened the economic outlook through domestic economic disruptions, declining exports and remittances, and rising stress in the financial sector**. FY20 GDP growth is projected in a range between 1.6 percent and a downside scenario of 1.0 percent. The downside forecast is based on a situation in which: (i) lockdown measures are extended and mobility remains

[1] Household Income and Expenditure Survey, 2000/01 through 2016/17.
[2] Bangladesh Garment Manufacturers and Exporters Association (BGMEA), as of May 22, 2020.

significantly constrained; and (ii) the global outlook deteriorates further. In FY21, growth is projected between 1.0 and -3.0 percent. In the downside scenario, a second round of infections and a prolonged global recession would result in the realization of some contingent liabilities, especially from the financial sector. The extended national shutdown is likely to depress economic activity across all sectors in the last quarter of FY20, and varying levels of control measures are likely to continue in FY21. Private consumption, the main engine of growth, is expected to slow, and declining remittance inflows expected to reduce household income. The unprecedented uncertainties related to COVID-19 are likely to further dampen private investment. The decline in exports is expected to persist, as developed market recessions depress demand for ready-made garments, Bangladesh's primary export. A shortage of intermediate inputs is expected to lower industrial production, while labor shortages could adversely impact all sectors. Transportation disruptions are expected to dampen agricultural growth, particularly production of perishable products like dairy, poultry, and vegetables. The recovery is expected to be very gradual, with ongoing economic disruptions and increasing fragilities in the banking system. In the medium term, a gradual recovery in growth is expected, with some increase in export demand and higher public spending.

4. **Bangladesh is extremely vulnerable to the effects of climate change.** The Global Climate Risk Index ranks Bangladesh as the world's seventh most affected country over the period 1999-2018.[3] Rising temperatures leading to more intense and unpredictable rainfalls during the monsoon season and a higher probability of catastrophic cyclones are expected to result in increased tidal inundation. It is estimated that a one-meter rise in sea levels would submerge 18 percent of arable land in coastal areas[4]. Recent studies estimate that by 2050 Bangladesh could have 13.3 million internal climate migrants[5]. Additional rural-urban migration would have significant consequences for air and water pollution and unsustainable consumption of natural resources, while putting additional pressure on urban labor markets. Addressing climate risks is increasingly becoming urgent to ensure sustainable economic development of the country.

B. Sectoral and Institutional Context

5. **Although Bangladesh has accelerated its structural shift from agriculture to industry and services in recent years, agriculture (including crops, livestock and fisheries) remains critical to eliminating poverty and boosting shared prosperity in the country**. The sector is: (i) the largest employer - 47.5 percent of the population is directly employed in agriculture and over 70 percent depends on agriculture in one form or another for their livelihood; (ii) a source of most of the country's food requirements; (iii) a source of raw materials for industry; and (iv) a generator of foreign exchange. Agriculture is also the main source of economic linkages in rural areas and thus plays a fundamental role in reducing poverty, which remains a predominantly rural phenomenon. In 2019, the sector contributed about 12.7 percent to the national GDP. While its contribution to the economy is likely to keep declining, agriculture will continue being the single largest contributor to income and employment of the rural population in the foreseeable future.

6. **The sector is characterized by traditional subsistence farming**. Production systems are largely dominated by small and marginal farmers, yet a significant shift towards commercial farming with high value crops, fisheries and animal products has been evident in recent years. Rice is the country's

[3] Germanwatch (2020) Global Climate Risk Index 2020.
[4] UNFCC (2007) United Nations Framework Convention on Climate Change.
[5] World Bank (2018) Groundswell: Preparing for Internal Climate Migration.

dominant crop[6] (77-80 percent of cultivated land is devoted to paddy) and a key component of the population's diet. The country ranks third and fourth in the world for fisheries and aquaculture production, respectively. Fisheries and aquaculture play a major role in employment: about 17 million people are associated with the fisheries sector, with 5 million people involved in marine fisheries. Pond and seasonal floodplain aquaculture supply over 50 percent of total yearly fish production in the country and are highly profitable relative to many field and commercial crops.

7. **Considerable gender gaps still persist in Bangladesh's agriculture sector.** Despite significant strides towards gender equality overall, and proclamations in myriad key policy documents[7] related to agriculture, rural development, and water resource management, there are still many barriers to women's participation in the agriculture sector. Access to and control over productive resources such as land, irrigated plots, credit, extension support and aquaculture assets (e.g. water ponds, *beels*) is skewed in favor of men. Often not considered "farmers," in part because they do not own land, women miss out on agricultural extension and information about new technologies, even when these relate to production enterprises (such as vegetable growing) in which women have typically predominated. In addition, socio-cultural norms (e.g. *purdah* practices) curtail the participation of women in downstream segments of agricultural value chains (e.g. in produce markets), which are generally more lucrative.

8. **Overall, from a long-term perspective, the performance of Bangladesh's agriculture has been mixed.** Following independence in 1971, sector growth increased at about 2 percent per year; accelerating to around 4 percent per year during the 1990s and early 2000s. Between 2010 and 2011, remarkable growth of 5.1 percent per year was achieved.[8] This momentum however, quickly fizzled out and the growth rate fell sharply to 2.7 percent in 2012, further decelerating to only 2.2 percent in 2013. In 2019, the growth rate (i.e. 3.9 percent) was still below the 4-4.5 percent growth rates by which the agricultural sector had to grow in order to achieve an average national GDP of 7 percent - often cited as the minimum GDP growth rate needed for Bangladesh to transition into middle-income status by 2021.[9]

9. **Among others[10], low productivity and limited diversification both in the crop and non-crop sector are responsible for the suboptimal performance of Bangladesh's agricultural sector.** Even with improvements over the last decade, the sector is characterized by a significant yield gap for most crops, largely due to limited adoption of modern technology. In the fisheries sector, average productivity for inland capture fisheries stands at 0.28 Mt/ha while that of inland culture fisheries stands at 1.53 Mt/ha, both below the averages observed in similar systems in Asia[11]. Productivity in the livestock sector is also below par, with local cows producing only about 221 kg milk per year and also registering low average fattening rates. In addition, as indicated in Gautam and Rafiquee (2016), over the last three decades, the overall structure of Bangladesh's agriculture has changed little. Rice dominates and drives much of agricultural growth while the contribution of diversification[12] to sector growth has often been low and

[6] Mainly because of the long running policy thrust on rice self-sufficiency.
[7] For example, the National Agricultural Policy, the National Food Policy, National Livestock Policy, the National Water Policy etc.
[8] This growth was mainly driven by irrigation expansion, modern technology, better road connectivity, more efficient markets and increased mechanization.
[9] Agriculture Sector Development Strategy: Background paper for preparation of Bangladeshi's 7th Five Year Plan.
[10] Other constraints to improved sector performance include but are not limited to low resource use efficiency and increasing loss of arable land.
[11] FAO. 2016. The State of World Fisheries and Aquaculture 2016.Contributing to food security and nutrition for all. Rome.
[12] Defined in this context as reducing the emphasis on rice/cereal and increasing the share of high-value agriculture (horticulture, livestock, and fisheries products).

fading. Diversification in the product mix of agriculture therefore, through a shift toward high-value products, has great potential for accelerating sector growth, contributing to meeting the growing demand for a diversified food supply, better nutrition, and building resilience of agriculture to climate change.

10. **Furthermore, extreme weather events including intense floods, drought and storms are also implicated in undermining the performance of Bangladesh's agricultural sector.** Flooding in Bangladesh is a near-constant phenomenon, only recurring with varying magnitude and intensity both in space and time. While the more regular low intensity floods have usually been beneficial, when they assume extreme proportions, floods result in precipitous crop losses, damages to aquaculture infrastructure and loss of aquaculture fish stocks, livestock death, and rural population displacement, thereby adversely affecting agricultural performance.[13] On the other hand, agricultural droughts, especially in the northern parts of the country frequently lead to crop failure, livestock death, land degradation, and also undermine groundwater replenishment, which is critical to performance of irrigated agriculture in those areas.

11. **Due to climate change, the frequency and intensity of extreme events in Bangladesh are predicted to increase and so are the impacts of these events on the agricultural sector.** Climate projections for the country point to an increase of 1.6 degrees centigrade in median temperature and an increase of 4 percent in median annual precipitation by the 2050s. Sea level, partly mediated by temperature is projected to rise by 45 cm because of global warming, and this would inundate 10-15 percent of the country, pushing the saline front further inland. Warming of the ground surface will aggravate moisture stress and drought, while excess evaporation of moisture will give rise to wetter peak monsoon.[14] With increasing river flow volume in monsoon, river bank erosion will be aggravated along the braided rivers forcing producers to lose their productive land.[15] The prospect of changing temperatures and precipitation patterns, combined with the uncertainty of the timing and magnitude of extreme events, and rising sea levels will have important impacts on the agriculture sector. Under a changed climate for example, production of rice - a key staple - is predicted to fall by 8 percent by the year 2050,[16,17,18] while that of wheat is expected to decrease by 32 percent. In addition, it is predicted that pulse yields under a changed climate will reduce by 8.8 percent, oilseed-rapeseed by 6.3 percent, vegetables (as a group) by 5.3 percent, and other crops (including jute) by 3.3 percent. With respect to the fisheries sector, increased temperatures will lead to a reduction in the availability of dissolved oxygen, resulting in the reduction in growth and reproduction success of most fish species. In cultured environments, increased occurrence of hypoxic conditions because of temperature increases will mediate a reduction of the growth rate and reproductive output of cultured fish species. Still under

[13] For example, the 1988 flood resulted in a loss of 2.1 million metric tons of rice, the 1998 flood resulted in a loss of over 3.35 million metric tons of rice, the 2004 flood led to agriculture production loss worth about US$500 million and losses related to the 2007 and 2009 cyclones were estimated at around two million metric tons of rice.

[14] Selvaraju, R., and others. 2006. Livelihood Adaptation to Climate Variability and Change in Drought Prone Areas of Bangladesh: Developing Institutions and Options. Rome: Asian Disaster Preparedness Centre (ADPC) and FAO.

[15] CEGIS, 2006. Impacts of Sea Level Rise in the Southwest region of Bangladesh, Center for Environmental and Geographic Information Services (CEGIS), Dhaka, p. 90.

[16] Sarker, Md Abdur Rashid, Khorshed Alam, and Jeff Gow. 2012. "Exploring the relationship between climate change and rice yield in Bangladesh: An analysis of time series data." *Agricultural Systems* 112: 11-16.

[17] Yu, W.H., Alam, M., Hassan, A., Khan, A.S., Ruane, A.C., Rosenzweig, C., Major, D.C., Thurlow, J., 2010. Climate Change Risks and Food Security in Bangladesh. Earthscan, Washington, DC.

[18] Amin, Md Ruhul, Junbiao Zhang, and Mingmei Yang. "Effects of climate change on the yield and cropping area of major food crops: A case of Bangladesh." *Sustainability* 7, no. 1 (2015): 898-915.

these environments, climate change, it is projected, will lead to increased disease spread, competition, parasitism and predation, thus affecting overall aquaculture productivity. Similar deleterious effects are predicted for most of the other agriculture subsectors, with attendant negative impacts and cascading consequences on livelihoods, especially for the poor and marginalized smallholder farmers.

12. **On the other hand, agriculture is the leading source of greenhouse gas (GHG) emissions, responsible for nearly 40 percent of overall emissions in Bangladesh.** About 32 percent of sector emissions accrue from rice production, 31 percent from enteric fermentation, 12 percent from manure and poultry litter management, while the remainder is from five other subsector activities.[19] In a "business as usual" scenario, agricultural emissions are likely to increase from 74.6 MtCO2e in 2012 to 89.2 MtCO2e in 2030, largely driven by enteric fermentation.[20]

13. **Addressing these imminent challenges for the agricultural sector demands a new vision and approach that integrates climate variability and climate change considerations into the pursuit of agricultural growth objectives.** Broadly categorized under the rubric of Climate-Smart Agriculture (CSA), such an approach presents opportunities for Bangladesh to achieve the "triple wins" of: (i) sustainably increasing agricultural productivity and farmers' incomes; (ii) adapting and building resilience to climate change*;* and (iii) reducing and/or removing GHG emissions (where possible) while also enhancing achievement of national food security and development goals.

14. **The Government of Bangladesh (GoB) already has in place several policies, strategies, and plans to foster the adoption of CSA**. In 2005, Bangladesh produced the National Adaptation Program of Action (NAPA) which provides an overarching strategic framework for mainstreaming climate change considerations into national planning and development priorities to achieve climate resilient development. Subsequent to the NAPA, in 2009, the Government prepared the Bangladesh Climate Change Strategy and Adaptation Plan (BCCSAP) which espouses essential action with respect to climate change along six thematic areas[21] and 44 program areas based on the development vision of the country. Through its Intended Nationally Determined Contributions (INDC), Bangladesh has put forth mitigation actions to tackle its growing emissions as a contribution to limiting global temperature rise and a strategy to transition to a low-carbon climate resilient economy. With the support of the World Bank (WBG) and the International Center for Tropical Agriculture (CIAT), Bangladesh produced a country CSA profile which, among others, identifies entry points for investing in CSA at scale. In a reinvigorated effort to address climate change, reduce disaster risks and significantly improve environmental performance, the government is in advanced stages of finalizing an integrated and holistic long-term plan – the Bangladesh Delta Plan 2100 (BDP 2100) to promote safe living through greater resilience and sound economic development. The Bank has financed the preparation of an Investment Plan that transforms the recommendations of the BDP 2100 into implementable concrete actions until 2030 as well as a Bangladesh Climate-Smart Agriculture Investment Plan, which identifies investments with the potential to shift Bangladesh's agriculture sector onto a more productive, more resilient and less emission-intensive growth path.

[19] See http://www.fao.org/faostat/en/#data/GT.

[20] *https://www.climatelinks.org/sites/default*/files/asset/document/GHG%20Emissions%20Factsheet%20Bangladesh_4-28-16_edited_rev08-18-2016_Clean.pdf.

[21] The pillars are a) food security, social protection and health; b) comprehensive disaster management; c) infrastructure development and protection; d) research and knowledge management; e) mitigation and low carbon development; and f) capacity building and institutional strengthening.

15. **Current government development plans for the agriculture sector prioritize improving productivity and building resilience to climate change impacts**. The development vision for the agriculture sector under the 7th Five Year Plan (FYP)[22] is to "ensure food and nutritional security, *through **sustainable intensification and diversification of climate resilient agricultural systems……***" Among others, the sector objective is to ensure sustained agricultural growth through more efficient and balanced utilization of land, water and other resources while carefully addressing climate change concerns, especially building resilience of local communities. This operation supports Government's priorities with respect to enhancing agricultural productivity while ensuring climate resilience of production systems. It focuses on the rehabilitation/modernization and improved management of priority Flood Control and Drainage (FCD) and Flood Control Drainage and Irrigation (FCDI) infrastructure for improved flood protection and drainage during the monsoon, increased water use efficiency during the dry season, and resilience and adaptation to climate change as well as the diversification, transformation and reorientation of agriculture and fisheries systems in the rehabilitated schemes towards CSA approaches.

C. Relevance to Higher Level Objectives

16. **The Climate-Smart Agriculture and Water Management Project (CSAWMP) seeks to improve climate-resilient water management for increased agricultural productivity and income growth while building the resilience of agriculture and the local communities to climate change.** The project therefore contributes to the attainment of Sustainable Development Goals (SDGs) on ending hunger, achieving food security and improved nutrition (SDG2); ending poverty (SDG1); resilient communities (SDG 11); and SDG13 on combating climate change and its impacts. Because the project will contribute to poverty reduction, it is also aligned with the WBG's Strategic Goal of ending extreme poverty by 2030 and promoting shared prosperity. By supporting increased agricultural productivity, the project will also contribute to GoB's 7th FYP (2016-2020), as agriculture performance is envisaged to play a critical role in the achievement of the targeted overall annual GDP growth rate of 7 percent, an essential condition for attaining middle-income status by 2021. The project contributes to National Level Policy Goal 1 (eliminate extreme poverty by 2030) and Delta Specific Plan Goal 1 (ensure safety from floods and climate change related disasters) and Goal 2 (enhance water security and efficiency of water usage) of the BDP 2100.

17. **The project also supports key elements of the WBG's Bangladesh Country Partnership Framework - CPF (FY2016-20, Report No. 103723-BD; March 8, 2016 discussed at the Board on April 5, 2016 and extended to FY2021 after the Performance and Learning Review).** The CPF seeks to support five transformational priorities, one of which is adaptive delta management. Areas of focus under the adaptive delta management priority to which the project would contribute include: (i) promotion of agricultural productivity and diversification; (ii) enhancing long-term planning for better land and water use and natural resource management; and (iii) revitalizing and strengthening key infrastructure to protect the population, reduce vulnerability, and secure growth. Specifically, the project is aligned and contributes to objectives 3.2 (improved water resource management for climate resilience) and 3.3 (increased adoption of sustainable agricultural practices), all under the CPF focus area 3 on climate and environment management. The project also aligns closely with the RISE[23] framework of the World

[22] The process is underway to produce the 8th FYP.

[23] RISE stands for Resilience, Inclusion, Sustainability and Efficiency, the four dimensions that the Sustainable Development Practice Groups will emphasize in the coming years.

Bank's Sustainable Development Practice Group, and with the areas of increased focus (Climate Resilience) of the South Asia Regional Strategy and the South Asia Climate Business Plan, which identifies CSA and water management as one of the key investment priorities.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

18. The Project Development Objective (PDO) is to enhance climate resilience and productivity of irrigated agriculture and fisheries in targeted schemes.

PDO Level Indicators

19. The key outcome level performance indicators include the following (see Results Framework in Section VI for more details):

(i) area under climate-resilient technologies and practices both under crop production and fisheries (climate resilience);
(ii) farmers adopting improved agricultural technology[24] (climate resilience, and irrigated agriculture productivity);
(iii) increase in productivity of selected agricultural commodities and fishery supported by the project (irrigated agriculture and fishery productivity); and
(iv) number of direct project beneficiaries (gender-disaggregated).

B. Project Components

20. The CSAWMP focuses primarily on: (i) rehabilitating and improving the quality of public FCD and FCDI infrastructure for climate-resilient water resources management; (ii) improving the management and sustainability prospects of FCD and FCDI infrastructure by supporting local communities to play an expanded role at all stages of scheme management (including contributing to Operation and Maintenance -O&M); (iii) promoting more efficient use of water resources through improved storage, on-farm water use efficiency and water productivity in the drought season; (iv) supporting the dissemination and adoption of CSA practices both in crop and fisheries systems; and (v) improving the marketing of agricultural products by the beneficiaries as an incentive for sustained adoption of CSA practices.

Component 1: Improved Climate Resilience of Flood Control, Drainage and Irrigation Infrastructure Systems (US$124.82 million, of which IDA US$97.43 million).

Sub-component 1.1: FCD/FCDI Scheme Rehabilitation and Modernization (US$118.71 million, of which IDA US$91.32 million).

21. Rehabilitation and modernization of selected FCD Schemes/FCDI Schemes.

22. Rehabilitation/modernization will focus on improving the capacity of the infrastructure to modulate the impacts of excess water during the monsoon period on one hand, and water deficits in the post-monsoon period on the other hand as well as on addressing technical hindrances - at least in some portions of the schemes- that have precluded the possibility of the production of many high-value non-

[24] Including fisheries technology.

cereal crops under irrigated conditions. Already, 19 schemes with a total command area of about 126,200 ha have been identified from a longlist of about 825 Bangladesh Water Development Board (BWDB) schemes in need of rehabilitation. To leverage rehabilitation as an incentive for improved performance, schemes that already have WMOs established or that have some form of O&M cost recovery in place (i.e., demonstrable evidence of self-help) were prioritized. Under this sub-component, the project's support will go towards feasibility studies, detailed designs, rehabilitation/construction, quality assurance and supervision of the rehabilitation works.

Sub-component 1.2: Management Transfer and Capacity Building of BWDB and WMOs (US$6.11 million, all IDA).

23. (a) support to facilitate transfer of FCD Schemes/FCDI Schemes management, operations and maintenance to communities, including through establishment and strengthening of WMOs, development of operations and maintenance plans, training of WMOs, preparation of climate change adaptation plans, and management of trade-offs and resolution of conflicts over drainage and water use; and (b) provision of training and capacity building of staff in the Office of Chief, Water Management (OCWM) and other relevant staff in BWDB.

Component 2: Climate-Smart Agriculture and Fisheries Production and Marketing (US$19.71 million, of which IDA US$17.05 million).

Sub-component 2.1: Support to Climate-Resilient Crop Production and Marketing (US$9.98 million, of which IDA US$8.72 million).

24. (a) demonstration and adoption of technology for sustainable crop intensification and climate change resilience, including mobilization and organization of WMO members in farmer field schools; provision of training to climate smart farmer field school- and other farmer field school- participants, lead farmers and extension agents; demonstration and promotion of improved agricultural water management technologies; and sourcing of new adaptation and mitigation technology (including for adoptive trials); (b) diversification of cropping systems at the FCD Scheme/FCDI Scheme level, including awareness creation of diversification among farmers; farmer experimentation with new crops and training/demonstration of relevant production technology; support for availability and access to seeds, germplasm and other inputs for new crops; and postharvest management/quality control; (c) improvement of crop marketing, including support for market intelligence/assessments/information systems; capacity enhancement of selected value chain actors; value addition; promotion of alliances between producers and the private sector; cooperative produce marketing; and infrastructure investments; and (d) support for women to engage in productive activities, and for women traders and entrepreneurs and women in market management.

Sub-component 2.2: Support to Climate-Resilient Fisheries Production and Marketing (US$9.73 million, of which IDA US$8.33 million).

25. (a) mobilization, formation and strengthening of community-based organizations to promote improved aquaculture production and marketing; and provision of support through community-based organizations, including for: deepening cooperatively owned/leased and managed water bodies and raising associated dykes; improving access to reasonably priced fingerlings of desirable quality; promoting conservation of indigenous species; and improving disease control and management; (b) promotion of coastal aquaculture (including integrated rice- fish/shrimp farming) and other fish farming; (c) strengthening of women's capacity to engage in fisheries value chain, including by increasing their

access to new technology, information, skills, assets and equipment, productive networks and funding; and (d) support for fish marketing and postharvest management and preservation including through setting up of cold storage facilities, provision of training on quality assurance, improvement of physical conditions of local markets, aggregation and onward group sale to bigger off-takers, and improved market information.

Component 3: Project Management Support (US$10.78 million, of which IDA US$5.52 million).

26. Support for project monitoring and evaluation and reporting, including for: impact assessments, financial and procurement management, communication, studies, development of interactive voice response system to promote citizen engagement and community feedback, development of management information system, and installation and use of accounting software, for: activities under Component 1 of the project, activities under sub-component 2.1 of the project, and activities under sub-component 2.2 of the project.

Component 4: Contingency Emergency Response (US$0.00 million).

27. Providing immediate response to an Eligible Crisis or Emergency, as needed.

Project Cost and Financing

28. **Indicative project cost, inclusive of price and physical contingencies and duties and taxes is estimated at US$155.31 million.** Of this amount, US$120 million is expected to be IDA credit financing, while US$35.31 million will be contribution from the GoB[25] as parallel financing for land acquisition, where required, and expenditures such as salaries, fuel, vehicles and others not covered under the Country Financing Parameters. Taxes up to a maximum of 15 percent can be covered under IDA financing. The project is processed under the Investment Project Financing (IPF) instrument.

29. The Project contributes to a structural transformation in Bangladesh's agriculture sector towards a more diversified production structure characterized by higher factor productivity and growth, supports resilience building (i.e. resilience to climate change) in the agriculture and fisheries systems, contributes directly to "Climate Change" - one of IDA19 policy priorities and will be funded by IDA Scale Up Window (SUW). Bangladesh is at a low risk of external and a low overall risk of debt distress, reflective of the country's capacity to absorb non-concessional resources and has since 2015 been SUW eligible. The proposed SUW financing will therefore not lead to a deterioration of Bangladesh's risk of debt distress, and is fully consistent with IDA's Sustainable Development Finance Policy. Table 1 summarizes the estimated project costs and financing.

Table 1. Summary Project cost and financing

Project Component	Project Costs (US$ million)	IDA Financing (US$ million)	Percent IDA Financing
Improved Climate Resilience of Flood Control, Drainage and Irrigation Infrastructure	124.82	97.43	81.19
Climate-Smart Agriculture and Fisheries Production and Marketing	19.71	17.05	14.21
Project Management Support[26]	10.78	5.52	4.60

[25] Beneficiaries are also expected to contribute through unskilled labor, leveling own plots in the FCD/FCDI schemes but this contribution is not costed.
[26] Includes refinancing of a Project Preparation Advance of US$0.35 million.

Contingency Emergency Response	0.00	0.00	0.00
Total cost	**155.31**	**120.00**	**100**

C. Project Beneficiaries

30. **Direct project beneficiaries, expected to be 170,000,** will include the entire universe of scheme dwellers benefiting from flood protection, farmers, members of Water Management Organizations (WMOs), the landless, and producer organizations in 20 FCD/FCDI schemes. Benefits to accrue to these direct beneficiaries include improvements in adaptive capacity, food security and incomes. In addition to the direct beneficiaries, technical and managerial staff of participating government agencies including Bangladesh Water Development Board (BWBD), Department of Agricultural Extension (DAE) and Department of Fisheries (DoF), among others, will benefit indirectly from the project through proposed training and capacity building activities. Other indirect beneficiaries include laborers and consumers from smallholder farm households not directly supported by the project, input suppliers, agricultural commodity off-takers and processors and consumers.

D. Rationale for Bank Involvement and Role of Partners

31. **The WBG's value added under this Project will be in three main areas**: (a) promoting knowledge sharing; (b) facilitating the multi-sector engagement required to pursue CSA, and (c) optimizing the use of funds. The Bank has unrivalled experience in supporting water management programs and related efforts to speed the adoption of improved climate-smart agricultural technologies and diversification of agricultural production systems. This knowledge has already been brought to bear in the project design. This support will be further expanded during implementation support missions. The Bank's commitment to the regular measurement of progress in relation to a well-defined results framework reinforces the results orientation of this investment. This is backed by the regular review of results achieved during each implementation support mission, and the evaluation of factors that may speed or undermine the achievement of the expected results. This coincides with the Government's stronger commitment to pursue accountability for targeted results under the 7th and 8th Five Year Plans.

E. Lessons Learned and Reflected in the Project Design

32. Several lessons and experiences drawn from the implementation of Bank-financed Water Management Improvement Project (WMIP) which closed in 2016, as well as from similar projects in the country and elsewhere in the region have informed the design of this operation. Key among these lessons are:

(i) **To ensure greater impact and sustainability, investments in improving FCD and FCDI infrastructure need to be coupled with support to agricultural productivity enhancement, as well as to upstream levels of the agricultural commodity value chain**. The WMIP focused mainly on rehabilitating and improving the functioning of FCD/FCDI infrastructure with no explicit attention to other agriculture support services (e.g. promotion and adoption of improved productivity enhancing technology or produce marketing). Such an approach does not maximize impact, farmers' income and return to investment. This is because improved water management when pursued alone, can increase yields - and impacts- only up to a certain level (up to about 3 tons/ha for rice for example). Beyond that, there is even much more considerable margin for yield improvement associated with proper management of soils, fertilizers, pests, and other inputs in irrigated areas as well as strong, positive interaction between irrigation and better

integration into markets. In addition to supporting the rehabilitation and modernization of water control infrastructure and improved water management, the CSAWMP project will support improved productivity for crop and fisheries enterprises, crop diversification towards higher value commodities, and also connect production with upstream levels of the value chain, particularly, access to markets. The proposed approach becomes even more valid in light of the findings of the WMIP impact assessment which clearly show that the primary motivation for farmers to engage in FCD/FCDI scheme management was the opportunities that flood control and irrigation would provide for them to pursue increased agricultural production as well as additional activities for livelihood improvement.

(ii) **Breaking the build-neglect-rebuild cycle that for most part has been the hallmark of FCD/FCDI scheme development in Bangladesh requires putting in place robust systems** that decentralize scheme management and also confer significant responsibility for O&M to beneficiary communities. FCD/FCDI development in Bangladesh has received substantial support from the GoB, the WBG and other development partners for many years. However, available evidence shows that sustainability and returns to investment remain a challenge. This is mainly attributed to low operational management capacity and poor maintenance systems. An evaluation of over 208 Bank-financed projects by the Independent Evaluation Group (IEG) confirms that the most promising way to improve O&M is to make beneficiaries responsible for their own O&M while providing them with technical support. The proposed project will build on the efforts initiated under WMIP to transfer the management of rehabilitated infrastructure from the BWDB to WMOs, and will strengthen the capacity of WMOs for O&M and water resource management for enhanced returns and sustainability of infrastructure. The project will also systematically pursue O&M cost sharing models initiated under WMIP (i.e. 100 percent for routine O&M, while the other major maintenance costs are defrayed by the BWDB) as a way of reducing reliance on public financing for O&M.

(iii) **Incentives to continued adoption of CSA technologies ultimately derive from market orientation and improved marketing opportunities**. Experience from Bank-financed projects in Bangladesh such as NATP-I and Integrated Agricultural Productivity Project (P084078), as well as from other countries, has shown that if farmers are to sustainably adopt any technologies even long after graduating from the project's support, they need to have favorable markets for their commodity product. Higher product prices will justify continuing investments in new seed, fertilizer, labor and any other related inputs underlying any CSA practices. This knowledge has justified the addition of cross-cutting marketing activities to the project design under component 2.

(iv) **Strong inter-institutional coordination among government departments and agencies as well as other stakeholders with key project implementation roles is critical to attainment of desired outcomes.** The CSAWMP design is based on an integrated approach to climate resilient agriculture with specific interventions related to water management (flood control, drainage, irrigation and water storage), improved on-farm water management technologies, and improved agriculture and fisheries management. In Bangladesh, each of these broad areas is the domain and mandate of a different government institution. Experience from WMIP showed the undesirable effect that the lack of a strong history of coordination between agencies (in this case, BWDB and DAE) – that had important roles in the project- had on project outcomes. Instead of relying on ad hoc collaborative arrangements as was the case in WMIP, collaboration between

BWDB, DAE, and DoF under CSAWMP will be ensured through high level commitments, MOUs and plans as articulated in the Development Project Proposals (DPPs) of BWDB, DAE and DoF, which although separate, will have a common objective to be achieved by working in a collaborative and integrated manner. Indeed, among others, the proposed Project Implementation Committee (PIC) and Project Steering Committee (PSC)under implementation arrangements (see Section III) are designed to guarantee integration and collaboration across the project elements.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

33. **The project implementation will be the joint responsibility of the Ministry of Water Resources (MoWR), Ministry of Agriculture (MoA) and the Ministry of Fisheries and Livestock (MoFL)**, respectively working through their implementing agencies, namely, BWBD, the Department of Agricultural Extension (DAE) and the Department of Fisheries (DoF). Each implementing entity - BWDB, DAE and DoF – will take the lead on project elements under their respective institutional mandate, capacity and skills endowment. In this case, BWDB will take the lead on activities related to project Component 1; DAE will be the lead entity on subcomponent 2.1; while activities targeting the improvement of fisheries production as defined under subcomponent 2.2 will be led by the DoF.

34. **There will be a Project Coordination Unit (PCU) at BWDB charged with overall coordination across all project activities.** The PCU will be headed by a Project Coordination Director and will be staffed with a Procurement Specialist, Financial Management Specialist, and M&E experts. The DAE and DoF will each establish a Project Implementation Unit (PIU) responsible for implementation of their respective components and coordinating with the PCU. Each of the PIUs will be headed by a Project Director (PD) and will also be staffed with a Financial Management Specialist, and a Procurement Specialist and M&E Specialist on an as needed basis. Both the PCU and PIU will be established within one month of project effectiveness. Short-term Technical Assistance/consultancy services will be sought to fill specific skill gaps during project implementation, as need arises.

35. **A Project Steering Committee (PSC) with representation from different ministries/agencies (as per GoB directive) will be established to provide overall policy guidance during project implementation**. The PSC will include members from MoWR, MoA, MoFL, Ministry of Land, Ministry of Local Government, Rural Development and Cooperatives, Irrigation Wing of Planning Commission, Implementation Monitoring and Evaluation Division (IMED) and ERD and will have the Senior Secretary/Secretary, MoWR as its Chair. The PSC will meet at least twice a year to review overall implementation progress and PCU will serve as its Secretariat. To ensure a fully integrated approach to implementation as envisaged in the design, there will be a Project Implementation Committee (PIC) overseeing the project technical functions including reviewing and integrating workplans and budgets, and reconciling tensions between crop and aquaculture land uses as is anticipated in some schemes. The PIC will be chaired by the Directors General of BWDB, DAE, and DoF on a rotational basis.

B. Results Monitoring and Evaluation Arrangements

36. **The proposal is to establish an M&E system with two different but complementary components and functions.** The first component will be designed to measure and monitor the level of achievement of expected results and outcomes. This will start with a baseline assessment, which will later be linked

with, and followed by, a mid-term evaluation survey, and an end of project evaluation survey. These main surveys will be backed by the more frequent and routine data collection on project performance and changes in indicators defined in the project results framework (Section VII) to facilitate progress reporting.

37. Under the overall leadership of BWDB, all implementing entities, backed by M&E Consultants will participate in data collection, compilation, and analysis for purposes of progress reporting. Given the importance of assuring a flow of benefits to women farmers, key indicators will be disaggregated by gender. On the other hand, the baseline, mid-term impact evaluation surveys will be contracted to a third party under guidance and with the support of the PSC. In line with the logic of the PWMR (2014), WMOs will participate in all M&E aspects at the relevant levels.

38. In complement, the second component of the M&E system will be in the form of a simple management information systems (MIS) designed to track implementation progress including disbursement, procurement, and the implementation of planned activities. The MIS will be funded by the project and will have separate but interlinked modules for the PIUs at DAE and DoF as well as the PCU.

C. Sustainability

39. **Key among the factors underlying the GoB's decision to adopt the PSM approach to FCD and FCDI scheme development and management was the limited sustainability of past interventions and investments.** Therefore, ensuring that this project's achievements endure beyond its life is a key objective that underpins several design features based on lessons and best practice. These include: (i) transferring the management of rehabilitated infrastructure to local communities to create a sense of ownership and hence willingness to defray some of the costs of scheme O&M through cost sharing-based on annual O&M plans; (ii) significant focus and resource allocation to building the capacity of beneficiaries (WMOs) in O&M to ensure proper use of the rehabilitated infrastructure; (iii) assurance of government continued commitment, as per the National Water Policy, to providing the necessary funds to the respective departments to take up the required essential maintenance that would be beyond the capacity of WMOs to finance; (iv) developing systematic capacity within BWBD, DAE and DoF for joint planning and implementation and post-project WMO nurturing activities; (v) pursuing and emphasizing improved agricultural productivity, diversification, and production as opposed to a singular focus on infrastructure repair so as to maximize benefits to farmers thereby ensuring continuation of project funded activities post-project closure; (vi) coupling investments in improved productivity and production with support to strengthening upstream levels of commodity value chains to guarantee marketing prospects and better farm-gate prices as a proportion of wholesale prices; and (vii) reliance on Government systems, mainly, for implementation.

IV. PROJECT APPRAISAL SUMMARY

A. Economic and Financial Analysis

40. **Development impact:** Project investments are expected to improve agricultural water management and agriculture and fisheries production and marketing in 20 FCD and FCDI schemes with gross command areas of approximately 126,253 ha, suitable for cropping and aquaculture. These gains are derived from investments in FCD/FCDI infrastructure rehabilitation, capacity building, promoting crop diversification, speeding the adoption of CSA practices for both crops and aquaculture, and

improved produce marketing. Main direct agricultural benefits from the project include: (i) increases in rice yields (of up to 9 percent) and non-rice crops (ranging from 5 to 29 percent, depending on crop); (ii) reduced flood, harvesting and post-harvest related losses (estimated to decline from 10 percent to 5 percent); (iii) diversification towards high value and nutritious crops, the levels of which will be determined by agroecological conditions and comparative advantages of each scheme; and (iv) increases in cropping intensity in FCDI schemes (ranging from 9 to 15 percent depending on local context). Direct aquaculture benefits include: (i) fish productivity increases – ranging from 2 percent to 40 percent; and (ii) decreases in flood and storage related fish production losses (from 5 percent to 2 percent). Direct flood protection benefits will be in the form of prevented flood-related losses of values of private and public assets, and agricultural and aquaculture production. Some of the additional crop and fish production will be consumed within the producing communities, thus directly contributing to household food security, while the remaining additional production will contribute to improving agricultural commodity supplies for a wider range of consumers serviced by different markets. Other direct benefits include: (i) enhanced resilience of water resources and agricultural production to impacts of climate change and variability (adaptation); and (ii) improved capacity of national institutions, especially the BWDB to promote efficient water use. Quantifiable indirect benefits include the multiplier and spillover benefits from increased incomes of crop and fish producers to non-farm rural communities[27] and reduced GHG emissions from agriculture and aquaculture (mitigation). Additionally, the project will contribute carbon emission savings of 255,224 tCo_2-eq annually which has been accounted in the economic analysis.

41. Based on potential returns to five representative schemes, project benefits are assessed for a period of 20 years (corresponding to the technical life of rehabilitated schemes if adequately managed, maintained and operated), at 2020 financial and economic prices, using a 5 percent opportunity cost of capital, an 8 percent financial cost of capital, and at 50 percent success rate[28]. When only direct benefits are considered (or base scenario), estimated financial rate of return (FRR) to the project investments is 11 percent, financial net present value (FNPV) is Bangladesh Taka (BDT) crore 207 and the benefit cost ratio (BCR) is 1.2. When the indirect benefits are added, the FRR increases to 18 percent, FNPV to BDT crore 778, and BCR to 1.8. Considering only the direct benefits, the estimated project economic rate of return (ERR) stands at 13 percent, the economic net present value (ENPV) at BDT 766 crore and the BCR at 1.6. The ERR increases to 18 percent, ENPV to BDT crore 1,455 and BCR 2.1 when both direct and indirect benefits are measured. When the GHG emission savings at low shadow prices for carbon are added to the base scenario, the ERR is estimated at 17 percent, ENPV at BDT crore 1291 and BCR 2.4 percent. Adding GHG emission savings at the high shadow prices for carbon yields the ERR of 21 percent, ENPV of BDT crore 1814 and BCR of 3.2.

42. **Justification for public financing:** In sum, the project proposes to use public financing to defray the costs related to three broad sets of activities including: (i) FCD/FCDI scheme rehabilitation and management and their operation and maintenance costs; (ii) promoting diversification and uptake of climate-smart technologies for crop and aquaculture production; and (iii) improved produce marketing. The FCD systems are purely public goods as their primary function is protection of human lives, public and private assets, including housing, schools, religious sites, road and other infrastructure, and

[27] According to Gautam and Rafiquee (2016), every 10 percent growth in farm income, translates into 6 percent growth in non-farm incomes in Bangladesh.

[28] Access to adequate public infrastructure (roads, storage) and non-rice technologies are critical to diversification. Therefore, the success rate is assumed conservatively at 50 percent.

businesses, and agricultural and aquaculture production from flooding. By protecting agricultural and aquaculture production, these systems also contribute to national food security and nutrition, and poverty reduction. In this case, public financing to strengthen flood protection and the institutional capacities of relevant public agencies is well justified. Indeed, for this reason, Bangladesh's National Water Policy does not envisage cost recovery for FCD in the foreseeable future.

43. Public financing for improved irrigation management is justified on the basis of the attendant improvements in use and sustainability of water resources- an important public good associated with protecting the environment- and the difficulty related to the high cost of irrigation infrastructure rehabilitation. Majority of project beneficiaries are smallholder farmers owning and subsisting on an average land holding of 0.15 ha and the landless poor who depend on leased farmlands and/or farm employment for their livelihoods. The beneficiaries are generally poor and unable to make the needed large investments into scheme rehabilitation on their own. As the cost of infrastructure rehabilitation is high, this has often created a financing gap for these farmers hence the justification for public financing.

44. In addition, the project will support crop diversification and reorientation of production systems (both for crops and aquaculture) in the rehabilitated schemes towards use of climate-smart production technologies. This is intended to yield both adaptation and mitigation co-benefits, which are global public goods. However, this entails adoption of new production technologies, an undertaking which is always perceived by farmers to be highly risky. In this case, public funding is justified as a means to share risks in testing new technologies and encouraging their adoption. Relatedly, most farmers in Bangladesh still rely on public support to gain information about new crop and aquaculture management technologies, hence the need for the proposed support using public resources. The project also aims to correct market failures underlying the relatively narrow non-rice agricultural produce markets, characterized by many low volume transactions, by promoting the testing of cooperative/group sales, as well as improved postharvest management and sale when prices are favorable, inter alia.

45. The level of public sector support is congruent with the intention to shift the orientation of private investment behavior by WMOs, individual farmers, input suppliers and commodity off-takers. Support to FCDI infrastructure rehabilitation is a one-off, with the expectation that once the infrastructure is transferred to the communities, and the WMOs are organized, trained and capacitated in use and maintenance, they (together with the BWDB where needed) will be able to satisfactorily undertake future O&M to ensure long-term sustainability. The support for climate-smart crop and aquaculture production and diversification encourages farmers and private input suppliers and marketers to evaluate new opportunities (in terms of new crops, new agricultural input needs, new markets etc.) and ways to adapt to changes in climate. The project also supports multiple commodity marketing strategies with the expectation that the more profitable strategies will be sustained as commercial undertakings by the project supported schemes.

46. **Greenhouse Gas Accounting:** It is World Bank policy to quantify the GHG mitigation potential of its projects as an important step in managing and ultimately reducing emissions. The EX-ACT tool is used to estimate GHGs emitted or sequestered as a result of the proposed project compared to the without-project scenario. Over 25 years (5 years for actual project implementation and 20 years for capitalization of its effects), the project constitutes a net carbon sink of ca.- 6,380,614 tCO_2-eq, or an annual sink of -255,224 tCO2-eq per year (see Annex 4). Annual net GHG emission value would be US$9.8 million when the low shadow prices of carbon are used, and US$19.8 million at the high shadow prices of carbon.

47. **Climate Co-benefits:** The project supports both climate change adaptation and mitigation efforts to reduce climate change impacts on the agriculture sector. The climate co-benefits for the project, computed as a share of the project cost devoted to climate adaptation and mitigation investments, were assessed to be 93 percent.

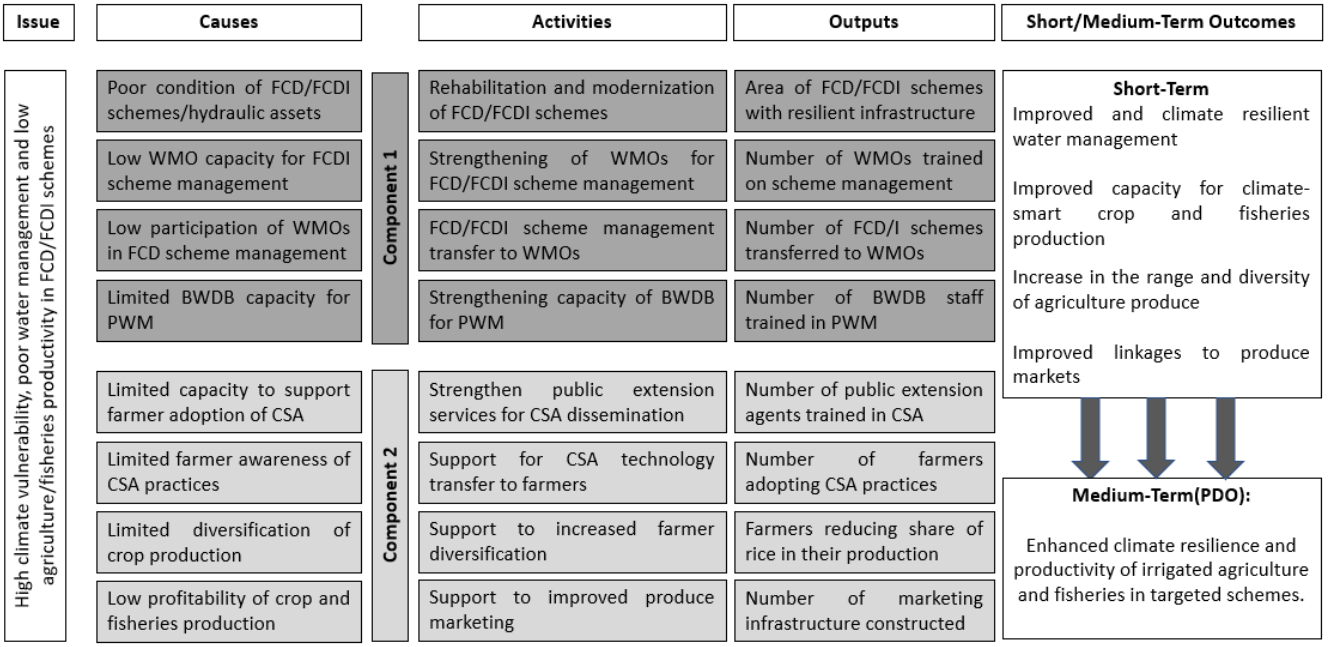
B. Technical

48. **The project technical design is mainly underpinned by the Government's DPPs from the BWDB, DAE and DoF.** Each of these proposals was developed based on technical studies and reviews by highly regarded experts. The design was also informed by the findings of a number of studies and assessments which include: (i) feasibility reports for select schemes which provide details on key aspects of the proposed infrastructure rehabilitation e.g. state of the schemes, activities to be supported, cost estimates, environmental and social safeguards issues related to the schemes, among others; (ii) PWMR (2004), which sketch the contours of collaboration between local communities, representatives of local government institutions, the private sector and the public-sector agencies in ensuring effective water management; (iii) Environmental Impact Assessments (EIAs) for select schemes; and (iv) the CSA country profile for Bangladesh which identifies already existing CSA practices in the country, lessons learned from implementation of these practices, and pathways for sustainably increasing productivity, adapting and building resilience to climate change, while reducing GHG emissions where possible. These studies, assessments and guidelines enabled the project to make concrete activity proposals, taking into account the experiences gained in related projects in Bangladesh and neighboring countries.

49. The final project design reflects the lesson and technical recommendation of the need for an integrated and balanced "infrastructure/agricultural service support" approach to FCD/FCDI development and rehabilitation and the necessity to equally focus on the demand side (markets) to not only drive the adoption of CSA practices but also ensure economic viability and sustainability of FCD/FCDI scheme rehabilitation. The conceptual framework links the efforts to promote sustainability of FCD/FCDI infrastructure and the adoption of CSA practices with improvements in incentives for investments in infrastructure O&M and technology adoption, by improving produce marketing.

50. **The schematic below illustrates the project's theory of change (TOC).** This TOC depends on several critical assumptions and could be affected by several external factors. The TOC assumes firstly that farmers are interested to diversify their crop selection, production methods, and marketing strategies. However, there is strong evidence globally that resource-poor farmers are highly risk-averse; hence, the project design incorporates both training/demonstration activities and access to limited support to offset the risks of adopting new technologies, practices, and crops. The TOC also assumes that PIM approaches will be sufficient to incentivize better FCD/FCDI scheme O&M and service delivery. While these approaches represent good practice in the sector globally, the project will need to monitor the extent to which water resource managers invest in improved system management given the well-documented cycle of build-neglect-rebuild that has characterized FCD/FCDI systems in Bangladesh. Finally, the TOC assumes that the three project implementing entities have an interest in coordinating their activities, despite historically siloed governance and implementation arrangements. Furthermore, the ability to achieve the project's development objectives could be affected by extreme climate conditions, and natural disasters.

Figure 1. CSWAMP Theory of Change



Note: CSA refers to agriculture and fisheries practices that sustainably increase productivity and system resilience while reducing GHG emissions

C. Fiduciary

(i) Financial Management

51. Based on the assessment of prevailing country system, fiduciary capacity of BWDB, DAE and DoF, and the implementation experience of Bank-financed projects with these agencies, the residual FM risk is rated moderate. Specific actions to improve capacity and internal controls, and thereby mitigate FM-related risks will need to be taken by the implementing agencies. These include:

- Appointment of experienced FM consultants at all PIUs (with ToRs acceptable to the Bank) along with adequate staff to support such functions in cost centers. All consultants and staff

with fiduciary duties will be provided regular training to ensure compliance with necessary requirements;

- Mainstreaming Integrated Budgeting and Accounting System (iBAS++) with separate Budget and Accounts Classification System (BACS) codes for fund flow (CSAWMP fund component agreement) budgeting and accounting (economic sub-category and line-items), and preparation of quarterly interim un-audited financial reports (IUFRs); and
- Risk-based internal audits with ToRs acceptable to the Bank.

52. Detailed fiduciary arrangements and internal controls will be spelled out in the PIM.

53. **Funds Flow, Budgeting and Accounting:** The project will be included in the BACS as a 'scheme' for the DPPs of respective Ministries to be determined under the operational segment for release of the allocated annual budgets to the PIUs. Budget preparation and execution will take place electronically using iBAS++ to facilitate timely release of funds for project execution. There will be three separate Designated Accounts (DA), in each PIU, in the form of Convertible Taka Special Account (CONTASA), which will be opened with a nationalized commercial bank to receive the credit funds for implementation of the relevant components of the Project. IDA funds will flow to the DAs based on submission of withdrawal applications, in the Client Connection, by the authorized signatory for the project. An alternative signatory arrangement will be made for submission of withdrawal applications to ensure unhindered flow of funds for project execution. The disbursement applications, to be submitted to the Bank, will be based on actual Statements of Expenditures (SOEs), incurred by the Project. The PCU in BWDB and the PIUs in DAE and DoF will be responsible for submitting the disbursement applications as often as once per month.

54. Each PIU will send yearly cash flow projections by June 30 of each year and this projection will be updated on a quarterly basis. Separate sets of accounts using BACS would be maintained in iBAS++ for each financing to ensure charging of expenses related under the appropriate financing. The project will prepare a separate Interim Unaudited Financial Report (IUFR) from iBAS++, in formats agreed with the Bank, on a quarterly basis and submit to the World Bank for review and clearance within 45 days from the end of each quarter.

55. **Disbursements and Flow of Funds:** The project will start with transaction-based disbursements and may convert to IUFR-based disbursements upon demonstrating the capacity to prepare reliable and timely financial reports. Funds (in BDT) will be disbursed through three separate Designated Accounts (DA). Counterpart financing of US$35.31 million will flow to the project as parallel financing, which will include land acquisition, costs that are not eligible under the existing country financing perimeter such as purchase of vehicles; recurrent expenditures such as workshop allowances, sitting allowances, cash per diems, honoraria and fuel; and customs duty-value added taxes and other taxes beyond 15 percent of total IDA allocation.

56. **Audit and Oversight Arrangements:** The PCU and each PIU will prepare the project Annual Financial Statements that will be submitted to the Comptroller and Auditor General's Office (CAG) of Bangladesh within three months of the end of each fiscal year. The annual audit will be conducted by the Foreign Aided Projects Audit Department (FAPAD) under the OCAG (Office of Comptroller and Auditor General). FAPAD will express an opinion on the project financial statement in accordance with international standards of auditing and submit the report within six months of the end of the fiscal year. In addition, the auditor will be required to provide a detailed management letter containing observations on internal controls and compliance with financial covenants in the Financing Agreement. The PCU and PIUs will be

responsible to provide clarifications on possible audit observations within 30 days from the receipt of the report. They will also ensure resolution of the audit observations on a timely manner by no later than 90 days from the receipt of the final audit report. Resolution of audit observations may include recertification, actions and refunds of the public money under question.

57. Additionally, a risk-based internal audit by an independent audit firm will be performed each year over the project term. Currently, there is no outstanding audit report for the implementing agencies. As per FM records of the Bank, there is no pending/overdue audit report by the Implementing Ministry for any ongoing /completed Bank financed project.

58. **FM Supervision Plan:** The following are the planned supervision and implementation support measures due to travel limitations for COVID-19 Pandemic: (i) virtual FM implementation support activities to keep engaged with implementing teams on issues impacting performance, compliance and reporting; (ii) electronic exchange of FM documents and accounting evidence; (iii) virtual meetings and discussions; (iv) Third-party verification for questionable and ineligible expenditures.

(ii) Contingency Emergency Response

59. Detailed implementation arrangements for this component will be set forth in an Annex to the PIM, that will be subject to IDA's review and approval. Among others, the details will include a designation of the entity (Coordinating Authority) to be responsible for the coordination and implementation of the component activities, specific activities which may be eligible for financing, procurement methods, documentation required for fund withdrawals, and environmental and social safeguards instruments, including management frameworks related to the activities to be funded.

60. Upon a determination by the GoB that an eligible crisis or emergency has occurred, it shall prepare and furnish to IDA for review and approval, a CERIP which shall set forth detailed arrangements for the activation of component activities, including: (i) specific activities to be financed; (ii) itemized costs for each expenditure item; (iii) implementation arrangements, (iv) procurement plan; and (v) details regarding compliance with environmental and social safeguards instruments.

(iii) Procurement

61. **General:** Procurement will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers, Fourth Edition, and the provisions of the Project Procurement Strategy for Development (PPSD) and procurement plan that may be updated from time to time with the Bank's approval. The project will be subject to the World Bank's Anticorruption Guidelines, dated October 15, 2006, revised in January 2011, and July 1, 2016. The project will use the Systematic Tracking of Exchanges in Procurement (STEP) to plan, record and track procurement transactions.

62. **Procurement Responsibility:** The PCU at BWDB will process all the goods and services procurement and the works procurement will be managed by the respective field units of the BWDB with review support from the PCU. The PIUs at DAE and DoF will process all procurements for their respective implementing agencies centrally. In addition, very small on-farm water management infrastructure will be constructed by the agencies using community driven development (CDD) approach. Procurement will involve goods, works, non-consulting and consulting services. Specific procurement activities will include: rehabilitation and modernization of select FCD/FCDI scheme infrastructure including re-sectioning of embankments, re-excavation/deepening of canals, excavation of larger water retention structures, rehabilitation and construction of water control structures, river erosion control/dredging and other protective works, construction of pump houses and installation of

new pumps, construction of irrigation related infrastructure, establishment of fisheries related structure (e.g. Post-Harvest Fish Service Center), procurement of agricultural related equipment, training and capacity building, development community database etc. The largest contracts in the project are planned as follows: 3 contracts totaling to US$50 million; 4 totaling to US$21 million; and another 12 contracts totaling to US$25 million all under Component 1 and only one large contract for US$2 million Under Component 2B.

63. **Procurement Capacity and Risks:** A detailed procurement capacity assessment carried out for BWDB, DAE and DoF indicates 'Substantial' residual risk in procurement operations and contract management. While BWDB and DAE have experience and capacity in processing Bank financed procurement, DoF has limited experience in Bank financed projects.

64. **Risks and Mitigation Measures:** The key risks that the project may face include: (i) delays in processing procurement; (ii) lack of knowledge in the Bank's Procurement regulations; (iii) lack of expertise on contract management; and (iv) delays due to the requirement of the Board approval for majority of the procurement transactions for BWDB. In order to minimize the procurement associated risks, a number of mitigations measures will need to be taken which include:

- Appointment of experienced procurement consultants (with ToRs acceptable to the Bank) along with adequate staff to support such functions;
- Formation of bid/proposal evaluation committees having the necessary expertise depending on the type of contract and with the membership of procurement consultant;
- Use of National e-Government Procurement (e-GP) for contracts to be procured using request for Bids (Open-National). Other contracts, e.g., international bidding, consulting services, will also use e-GP, whenever these are operational in the e-GP system of the country;
- Training of project officials including evaluation committee members on Bank Procurement Regulations, country procurement laws, STEP and other aspects of procurement;
- Use of the Bank's Standard Procurement Documents (SPD) for goods, works and non-consulting services where international competition is required and Standard Request For Proposals (SRFP) for consulting services, including their respective forms of contract. For all other procurement, Model Tender Documents (MTD) agreed with the Bank would be used;
- Other due-diligence measures including: (i) verification of recommended bidders' post-qualification information during bid evaluation; (ii) making bidders aware about fraud and corruption issues in writing and/ or at pre-bid/ proposal meetings, as applicable; (iii) preserving all procurement related documents to facilitate smooth post procurement reviews; and (iv) publishing contract award information at the Central Procurement Technical Unit (CPTU) and the respective agencies website within two weeks of contract award (and in UNDB online for international contracts).

65. **Procurement Plan:** The Project Procurement Strategy for Development has been prepared. The Procurement plan includes estimated costs, procurement methods, contract arrangements, prior review requirements, processing timeframe, among other relevant information. Procurement plan and its revisions will need the Bank's review and approval. A General Procurement Notice (GPN) will be published on the Bank's website and the UNDB Online once the project is approved.

D. Safeguards

(i) Environmental Safeguards

66. No significant irreversible environmental impacts from proposed project activities are envisaged; therefore, the proposed environmental screening category is B. Any environmental impacts and issues are expected to be mostly construction related. These include, disturbance of the aquatic habitat, changes in landform and land use, contamination of land and water, loss of trees, operation of construction machinery, air quality deterioration, noise generation, worker's health and safety, etc. These impacts can be mitigated through proper design and implementation of relevant Environmental Management Plans (EMPs).

67. The Project will trigger the following environmental safeguard polices: Environmental Assessment (OP/BP 4.01) and Pest Management (OP/BP 4.09). Since most of the subprojects have not yet been designed or even identified, a framework approach to environmental safeguards implementation has been adopted. An Environmental Management Framework (EMF) has been prepared to meet the requirements of Environment Conservation Rules 1997 of Bangladesh, the Safeguard Policies of the WBG and the Environmental, Health and Safety Guidelines of the World Bank Group. A full-time Environmental Specialist will be appointed and retained in the PCU to oversee all project environment management aspects. In addition, the project will support capacity building for all relevant project officials to facilitate compliance with the project environment safeguards requirements. Prior to implementation of any subproject, an environmental screening/assessment would have to be conducted and the specific EMP together with necessary budget and special environmental clauses shall be incorporated in the respective bid documents. The BWDB will be responsible for getting necessary environmental clearance from the Department of Environment (DoE). Environmental grievance issues are integrated into the project Suggestions and Complaints Mechanism (SCM) referred to in section E above on social safeguards.

68. The project Environment Assessment (EA) both in English and Bangla was disclosed on December 22, 2020 on the BWDB, DoF and DAE websites and WBG's website. Hard copies of the document have also been made available in all field offices related to the project.

69. Since the project involves rehabilitation and improvement of FCD and FCDI schemes, some of which may receive water from various international rivers or their tributaries, OP 7.50 (Projects on International Waterways) applies. An exception to the notification requirement was pursued and approved by Bank management because the project involves alterations to FCD/FCDI schemes that only require rehabilitation, construction, or other changes that in the judgement of the Bank: (i) will not adversely change the quality or quantity of water flows to the other riparians; and; (ii) will not be adversely affected by the other riparians' possible water use.

(ii) Social Safeguards

70. The project aims for structural improvement in the flood control, drainage and irrigation schemes (subprojects) and improved water management and resilience of agriculture and aquaculture to climate change impacts. Civil works will be identified, designed and implemented using participatory scheme cycle management (PSM) approach following the PWMR, 2014. The project approach is also to identify and design detailed activities at selected schemes at the implementation stage engaging the beneficiaries but avoiding involuntary acquisition of land and displacement of people to the extent feasible. Rehabilitation and improvement of embankments and replacement of existing water control

structures will be done within existing land, but involuntary land acquisition may also be involved where existing embankments require design improvements or where new embankments are constructed and this will be funded using GoB's contribution. Restoration of scheme irrigation and drainage canals may require voluntary donation of land (following due process and proper documentation). However, involuntary displacement of people-largely informal settlers on existing embankments is likely as experienced in similar past projects. Although adverse social effects on the country's tribal people will be fully avoided, project activities in some areas may also involve beneficiaries from the tribal communities.

71. The project therefore triggers World Bank operational policies on involuntary resettlement (OP/BP 4.12) and on indigenous peoples (OP/BP 4.10). Land acquisition only in critical requirement will be done following the new law titled "The Acquisition and Requisition of Immovable Property Act 2017" that replaced the earlier Ordinance II of 1982 on land acquisition on September 21, 2017. Since not all subprojects have been identified, a framework approach to social safeguards has been adopted and BWDB has developed a Social Management Framework (SMF) – including provisions for involuntary resettlement and indigenous people as part of the Environmental and Social Management Framework (ESMF) to serve as a guidance for social screening, impact assessment, preparation of Social Management Plans (SMP) and grievance management during implementation.

72. The SMF, along with a Bangla translation, has been prepared with the involvement of beneficiaries as per BWDB institutional guidelines for any water resource management interventions. It includes a grievance redress mechanism (GRM) for inclusive resolution of project level complaints and grievances. The project will hire a fulltime Social Specialist in the PCU and at the PIUs in DAE and DoF to oversee social safeguards implementation throughout the project's life and also support capacity building and training of relevant project officials to ensure effective compliance. The SMF and its Bangla translation were disclosed locally on December 22, 2020 and on Bank websites.

73. **Gender Analysis**: Identified gender gaps in the project context include limited access to and control over productive resources such as land, irrigated plots, credit, extension support and aquaculture assets (e.g. water ponds, *beels*) for women. As elaborated in the gender action plan in the SMF, the project will address these gaps through dedicated support to women to acquire productive assets e.g. beels and fish fingerlings, support to engage in enterprises that do not require land ownership (e.g. production and sale of planting materials, fingerlings), provision of female sections in markets to encourage their participation in produce marketing etc. Women will also occupy at least 30 percent of management positions in WMOs.

74. **Citizen Engagement**: The project has a robust CE strategy which includes: (i) participatory planning, decision making, and implementation for water infrastructure rehabilitation and management; (ii) mobilization of the beneficiary population targeted for climate-smart agricultural crop production support into common interest groups with a voice on all aspects of project support; (iii) beneficiary feedback mechanisms (satisfaction surveys, etc.) to ensure that beneficiaries are satisfied with the services; and (iv) development of a GRM to respond to the needs of beneficiaries and to address and resolve their grievances and serve as a conduit for soliciting inquiries, inviting suggestions, and increasing community participation. The project also includes a beneficiary feedback indicator measuring percentage of beneficiaries satisfied with services provided.

(iii) Grievance Redress Mechanisms

75. Communities and individuals who believe that they are adversely affected by a World Bank (WB)

supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service.
For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

V. KEY RISKS

76. Overall risk rating is Substantial (see SORT). The risk to the PDO arising from the political and governance situation in the country is rated **Substantial**. This is mainly attributed to the continuing challenges in public sector governance in the country, against a backdrop of some relatively large dredging and construction contracts anticipated to be financed under the project. The choice of the project's FM and procurement arrangements is partly based on the need to mitigate these challenges.

77. Macroeconomic risk is rated **Substantial** mainly due to the COVID-19 pandemic- induced slowdown of the economy and its potential impact on the country's fiscal position, which could undermine the capacity of the government to defray project costs currently programed to be financed out of its contributions.

78. The risk with respect to the technical design of the project is rated **Substantial** and this is due to the multi-sectoral nature of the proposed interventions, requiring a multiplicity of implementing entities from different ministries. Experience in Bangladesh shows that coordinating activities across several ministries is a daunting challenge. This risk will be mitigated by clearly defining the implementation roles and responsibilities of each of the implementing entities and creating an intersectoral PSC and PIC, the responsibilities for which, among others, will be to ensure effective coordination and integration across project activities; and by putting in place a multi-global practice implementation support team to foster integration across project activities.

79. The risk to attainment of the PDO arising out of institutional capacity for implementation and sustainability is also rated **Substantial.** This is because of the limited capacity of the OCWM in BWDB to perform its role of organizing, registering and training WMOs in their new functions in managing routine O&M of FCD/FCDI scheme infrastructure - a key plank of the PSM approach that the project will promote. In addition, sustainability prospects, especially of the infrastructure to be rehabilitated hinge on adequate funding for O&M and continued government commitment to the sector reforms that the project seeks to deepen. Capacity weaknesses in the OCWM will be remedied through the proposed capacity strengthening activities while availability of O&M funds will be through farmers' and government contributions.

80. Fiduciary risk is rated **Substantial** because in general, the procurement systems in the implementing agency as well as the other relevant ministries are still weak and may undermine accountability and achieving value for the project money. This risk will be mitigated through hiring of a Procurement Specialist at the PCU and combined with capacity building by the Bank team. Detailed risks

and mitigations measures are mentioned in the procurement section.

81. The environment and social risk is rated **Substantial** mainly because some of the project activities (especially those related to rehabilitation and construction of new embankments) could involve involuntary displacement of people and involuntary land acquisition. This risk will be managed following the guidelines provided in the project resettlement framework, which is part of the SMF.

82. Stakeholders risk is rated **Substantial** and this is related to the inevitable exclusion of sections of otherwise equally deserving schemes/beneficiaries from project support - as dictated by available resources - which could create a perception of exclusion of some communities. This risk will be mitigated by relying on a participatory, inclusive and transparent scheme selection mechanism based on clear eligibility and selection criteria that will be communicated to communities through the relevant political and community leaders.

VI. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Bangladesh

Climate-Smart Agriculture and Water Management Project

Project Development Objectives(s)

To enhance climate resilience and productivity of irrigated agriculture and fisheries in targeted schemes

Project Development Objective Indicators

Indicator Name	PBC	Baseline	End Target
Enhance climate resilience and productivity of irrigated agriculture & fisheries in targeted schemes			
Area under climate-resilient technologies and practices both under crop production and fisheries (Hectare(Ha))		0.00	95,000.00
Farmers adopting improved agricultural technology (CRI, Number)		0.00	100,000.00
Farmers adopting improved agricultural technology - Female (CRI, Number)		0.00	50,000.00
Farmers adopting improved agricultural technology - male (CRI, Number)		0.00	50,000.00
Increase in productivity of selected agricultural commodities and fishery supported by the project (Percentage)		0.00	18.60
Rice (Percentage)		0.00	7.50
Fisheries (Percentage)		0.00	37.00

Indicator Name	PBC	Baseline	End Target
Vegetables (Percentage)		0.00	10.00
Number of direct project beneficiaries (Number)		0.00	170,000.00
Percent of which are female (Number)		0.00	50.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Improved Climate Resilience of Flood Control, Drainage and Irrigation Infrastructure Systems								
Area provided with new/improved irrigation or drainage services (CRI, Hectare(Ha))		0.00						120,000.00
Area provided with new irrigation or drainage services (CRI, Hectare(Ha))		0.00						5,000.00
Area provided with improved irrigation or drainage services (CRI, Hectare(Ha))		0.00						115,000.00
Percent reduction in crop area damaged by floods in completed schemes (Percentage)		0.00						60.00
Percentage of WMOs with Annual Budgets and O&M plans (Number)		20.00						80.00

Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Percentage of the planned routine O&M costs covered by WMOs (Percentage)		30.00	0.00	10.00	60.00	80.00	90.00	90.00
Climate-Smart Agricultural and Fisheries Production and Marketing								
Farmers reached with agricultural assets or services (CRI, Number)		0.00						150,000.00
Farmers reached with agricultural assets or services - Female (CRI, Number)		0.00						75,000.00
Percentage of farmers producing non-rice crops or engaging in other agricultural enterprises (Percentage)		50.00						80.00
Proportion of which are female (Percentage)		0.00						50.00
Ratio of farm-gate to wholesale prices (Number)		0.62						0.75

Indicators to be Mapped	Baseline	End Target
Intermediate Outcome Indicators		
Number of government staff trained through the project (Number)	0.00	400.00

Indicators to be Mapped	Baseline	End Target
Percentage of whom are female (Number)	0.00	40.00
Citizens and/or communities involved in making decisions on beneficiary selection (Yes/No)	No	Yes
Beneficiary satisfaction with project (Percentage)	0.00	70.00
Female beneficiary satisfaction (Percentage)	0.00	70.00

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Area under climate-resilient technologies and practices both under crop production and fisheries	This indicator measures aggregate area (both arable land and aquaculture) under CSA technologies	Seasonal	Surveys		BWDB, DAE, and DoF
Farmers adopting improved agricultural technology	This indicator measures the number of farmers (of agricultural products) who have adopted an improved agricultural technology promoted by operations supported by the World Bank. NB: "Agriculture" or "Agricultural" includes:	Seasonal	Surveys		BWDB, DAE, and DoF

	crops, livestock, capture fisheries, aquaculture, agroforestry, timber and non-timber forest products. Adoption refers to a change of practice or change in use of a technology that was introduced or promoted by the project. Technology includes a change in practices compared to currently used practices or technologies (seed preparation, planting time, feeding schedule, feeding ingredients, postharvest storage/ processing, etc.). If the project introduces or promotes a technology package in which the benefit depends on the application of the entire package (e.g., a combination of inputs such as a new variety and advice on agronomic practices such as soil preparation, changes in seeding time, fertilizer schedule, plant protection, etc.), this counts as one technology.				

	Farmers are people engaged in farming of agricultural products or members of an agriculture related business (disaggregated by men and women) targeted by the project.				
Farmers adopting improved agricultural technology - Female		Seasonal	Surveys		BWDB, DAE, and DoF
Farmers adopting improved agricultural technology - male		Seasonal	Surveys		BWDB, DAE, and DoF
Increase in productivity of selected agricultural commodities and fishery supported by the project		Annual	Surveys and annual progress reports		DAE and DoF
Rice		Annual	Surveys		DAE
Fisheries		Annual	Surveys and annual progress reports		DoF
Vegetables		Annual	Surveys and annual progress reports		DAE
Number of direct project beneficiaries	This indicator measure number of individuals benefiting from the project	Quarterly	Progress reports, surveys		BWDB, DAE, and DoF

	activities. To avoid double counting, any individual receiving more than one benefit would be counted once				
Percent of which are female		Quarterly	Progress reports and surveys		BWDB, DAE, and DoF

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Area provided with new/improved irrigation or drainage services	This indicator measures the total area of land provided with irrigation and drainage services under the project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).	Annual	Monitoring reports and surveys		BWDB, DAE
Area provided with new irrigation or drainage services	Measures in hectares the total area of land provided with new or improved irrigation or drainage services in operations supported by the World	Annual	Monitoring reports and surveys		BWDB and DAE

	Bank.				
Area provided with improved irrigation or drainage services	Measures in hectares the total area of land provided with new or improved irrigation or drainage services in operations supported by the World Bank.	Annual	Monitoring reports and surveys		BWDB and DAE
Percent reduction in crop area damaged by floods in completed schemes		Seasonal	Surveys and monitoring reports		BWDB and DAE
Percentage of WMOs with Annual Budgets and O&M plans		Quarterly	Progress reports and surveys		BWDB, DAE and DoF
Percentage of the planned routine O&M costs covered by WMOs		Annual	Progress reports and surveys		BWDB, DAE and DoF
Farmers reached with agricultural assets or services	This indicator measures the number of farmers who were provided with agricultural assets or services as a result of World Bank project support. "Agriculture" or "Agricultural" includes: crops, livestock, capture fisheries, aquaculture, agroforestry, timber, and	Seasonal	Progress reports and surveys		DAE, DoF and BWDB

	non-timber forest products. Assets include property, biological assets, and farm and processing equipment. Biological assets may include animal agriculture breeds (e.g., livestock, fisheries) and genetic material of livestock, crops, trees, and shrubs (including fiber and fuel crops). Services include research, extension, training, education, ICTs, inputs (e.g., fertilizers, pesticides, labor), production-related services (e.g., soil testing, animal health/veterinary services), phyto-sanitary and food safety services, agricultural marketing support services (e.g., price monitoring, export promotion), access to farm and post-harvest machinery and storage facilities, employment, irrigation and drainage, and finance. Farmers are people engaged in agricultural activities or members of an agriculture-related business (disaggregated by men and				

	women) targeted by the project.				
Farmers reached with agricultural assets or services - Female		Seasonal	Progress reports and surveys		DAE, DoF, and BWDB
Percentage of farmers producing non-rice crops or engaging in other agricultural enterprises		Seasonal	Surveys and monitoring reports		DAE
Proportion of which are female		Seasonal	Surveys and monitoring reports		DAE
Ratio of farm-gate to wholesale prices		Seasonal	Surveys and progress reports		DAE and DoF

ANNEX 1: Adjustments to the Bangladesh Country Program in Response to COVID-19

1. **The World Bank Group engagement in Bangladesh has been guided by the FY2016–20 CPF, which has been extended to FY2021 after the Performance and Learning Review (PLR).** The PLR reaffirmed the three CPF focus areas: (i) growth and competitiveness; (ii) social inclusion; and (iii) climate and environment management. It also recognized the recent program adjustment in response to the Rohingya refugee crisis, and recommended greater attention to human capital, climate resilience, and digital transformation.

2. **COVID-19 pandemic has severely disrupted economic activity and created an unprecedented crisis that is likely to worsen poverty in the short term.** As the pandemic intensified globally, Bangladesh exports to Europe and the United States declined precipitously. Growth in GDP is projected to range in FY20 between 1.6 and 1.0 percent and in FY21 between 1.0 and -3.0 percent. The country's achievement in reducing poverty between 2000 and 2016 will likely be reversed. Slower GDP growth, the income losses of informal workers throughout the economy, and lower international remittances may add 8 to 12 percentage points to what the 2020 poverty rate would have been without COVID-19.

3. **Along with its health care response to the pandemic, the government has also adopted an emergency economic program.** Its goals are to: (i) increase public spending to generate employment; (ii) provide a stimulus package offering firms credit at low interest rates to retain workers in the manufacturing sector, maintain competitiveness of the enterprises especially in the export-oriented manufacturing sector and to revitalize economic activities; (iii) expand social safety nets to meet the basic needs of the poor, day laborers, and other informal sector workers; and (iv) increase the money supply to maintain liquidity in the economy while containing inflation.

4. **The government has reached out to partners to support the national COVID-19 response plan.** The International Monetary Fund (IMF) Board on May 29, 2020, approved a request for disbursement of 50 percent of Bangladesh's quota (US$732 million) from the Rapid Credit Facility and the Rapid Financing Instrument. The Asian Development Bank (ADB) approved a US$100 million loan for health sector emergency support and a US$500 million loan in budget support from its Countercyclical Support Facility. The Asian Infrastructure Investment Bank (AIIB) provided US$250 million in co-financing to the ADB budget support and JICA is preparing another US$300 million in co-financing. Bangladesh has opted not to participate in the G20 Debt Service Suspension Initiative (DSSI). However, the authorities will continue to monitor the situation and if it becomes necessary will revisit their position.

5. **The indicative IDA19 allocation for Bangladesh is SDR2.848 billion, of which SDR 1.277 billion is frontloaded to FY21.** With the adjusted lending program proposed in the PLR fully delivered, the lending program for FY21–FY22 is geared towards supporting the jobs and economic transformation agenda, expanding social safety nets, and building institutional and investment resilience—all priorities the COVID-19 crisis has made even more urgent. The WBG lending program for FY21–22 is aligned with the Approach Paper on "Saving Lives, Scaling-up Impact and Getting Back on Track":

- To *save lives*, the Bank is supporting the Bangladesh COVID-19 response program with US$100 million from the Fast Track Facility for COVID-19 and is reprogramming resources to support the pandemic response for the displaced Rohingya population and host communities, e.g., through the current Health and Gender Support Project (P171648). The planned Bangladesh Urban Health Nutrition and Population Project (P171144, FY22) will improve delivery of primary health care and environmental health services for targeted poor urban populations. A proposed project for

Improving Hospital Quality and Financial Protection for the Poor (P174439, FY22) will reinforce management and delivery of hospital services and improve protection from impoverishing health costs.

- To protect *the poor and vulnerable*, the Bank has activated the Contingent Emergency Response Component of two active IDA projects in the total amount of US$265 million. The Bank has partnered with the French Development Agency to add US$165 million to the Cash Transfer Modernization Project (P160819); and is giving rural areas priority for water sanitation and hygiene (WASH) investments through the Rural Water, Sanitation and Hygiene for Human Capital Development Project (P169342). The follow-up project to the Nuton Jibon Livelihood Improvement Project (P149605) will provide income support for poor and extremely poor rural communities. Using the Private Sector Window (PSW), IFC has two investment projects in the FY21 pipeline that will use microfinance institutions to support very small enterprises and women-owned microenterprises.
- To *save livelihoods, preserve jobs, and ensure more sustainable business growth and job creation*, IFC is supporting clients and sector associations in the ready-made garment and financial sectors by providing US$75 million in working capital lines and advisory services for risk management and recovery. In FY21, IFC plans additional projects in manufacturing and finance through the COVID-19 response facility with PSW support. IFC advisory programs are also providing technical support for repurposing production lines for personal protective equipment, together with continued Public Private Dialogue on diversification in manufacturing. IFC's upstream program has already begun work on economic zones and port logistics for boosting export diversification and job creation. Additional funding and advisory services will be provided to financial institutions to improve both lending to small and medium enterprises and risk management, following up on the first COVID-19 response financing line to City Bank in June 2020. IFC will continue to diversify its lending products, having launched the Taka-denominated Bangla Bond on the London Stock Exchange early in FY20. The IDA lending program for FY21–FY22 focuses on youth through the Accelerating and Strengthening Skills for Economic Transformation (P167506) and the Higher Education Acceleration and Transformation Project (P168961). Recovery and Advancement of Informal Sector Employment (P174085) will support the economic inclusion of informally employed urban youth. The World Bank will support micro, small, and medium enterprise (MSME) development and access to finance through the Rapid Response for MSME Support and Credit Enhancement Project, which will help the government to set up a risk-sharing facility to enhance credit flows from commercial banks to MSMEs.
- To *strengthen policies, institutions, and investments for resilient, inclusive, and sustainable growth,* the Bangladesh Programmatic Recovery and Resilience Development Policy Financing (P174892) of US$500 million (US$250 million in FY21 and US$250 million in FY22) will reinforce reforms to strengthen the resilience of the economy and support private sector interventions and market solutions in critical sectors. The Local Government COVID-19 Response and Recovery Project (P174937) will build the capacity of local governments to coordinate and manage response and recovery efforts across the country. The Third Programmatic Jobs Development Policy Credit (P168725) will continue to support policy reforms in trade and investment for more and better jobs; improve access of the vulnerable population to jobs; and strengthen the safety net when they lose jobs. Following the approval of the additional financing for the Modern Food Storage Facilities Project (168484) in early FY21, the Bank will support Bangladesh's continued investment in resilient

agriculture through the Climate-Smart Agriculture and Water Management Project (P161534). Investment operations in environment, urban, and infrastructure resilience are also planned. IFC will provide more advisory programs on firm resource efficiency to reduce water consumption and GHG emissions, while lowering operating cost and enhancing firm competitiveness.

6. **This engagement plan adheres to the selectivity principles of strong alignment with the Government's development and COVID-19 response strategies**, WBG comparative advantage and complementarity with activities of other development partners. It has been discussed with the authorities and has been shared with other development partners through the donor coordination platform.

ANNEX 2: Detailed Project Description

COUNTRY: Bangladesh
Climate-Smart Agriculture and Water Management Project

1. **Over 80 percent of the land area in Bangladesh is a floodplain, crisscrossed by more than 400 rivers.** High rainfall during the monsoon season, combined with full-flowing rivers typically leads to extensive inundation of the flood plain, a situation which is exacerbated by slow impeded drainage – an artefact of the predominantly flat topography. Each year, on average, 22 percent of the country is inundated, flooding over 6 million hectares to depths ranging from 0.3 to 2 meters. During severe floods, the affected area may exceed 67 percent of the country. This creates both opportunities and risks - opportunity for highly productive crop and aquaculture production, but considerable risks from deep flooding, erosion and drainage problems. In stark contrast, in the post-monsoon period, the availability of surface water is significantly reduced and this, combined with the erratic pre-monsoon rainfall, can cause serious soil moisture deficits, which must be addressed through irrigation. Due to climate change, the severity of these extreme weather phenomena is expected to increase. Under these circumstances, flood control and drainage will increasingly be critical to agricultural production in the monsoon and post-monsoon seasons, while irrigation will be key to addressing water deficits in the dry season. Against this backdrop, the public sector has constructed over 877 FCD and FCDI schemes covering about 6.4 million hectares of land, creating economic opportunities for the poor by ensuring increased agricultural production. Most of these schemes need rehabilitation while some, especially those that were constructed long ago, need to be modernized or upgraded using higher design standards to take into account the increased frequency and intensity of floods as a result of climate change.

2. The CSAWMP focuses primarily on: (i) rehabilitating and improving the quality of public FCD and FCDI infrastructure for climate-resilient water resources management; (ii) improving the management and sustainability prospects of FCD and FCDI infrastructure by supporting local communities to play an expanded role at all stages of scheme management (including contributing to Operation and Maintenance -O&M); (iii) promoting more efficient use of water resources through improved storage, on-farm water use efficiency and water productivity in the drought season; (iv) supporting the dissemination and adoption of CSA practices both in agriculture and fisheries systems; and (v) improving the marketing of agricultural products by the beneficiaries as an incentive for sustained adoption of CSA practices.

3. **The project seeks to build on and scale up activities implemented under the Bank-financed Water Management Improvement Project (WMIP), that closed in June 2016**. WMIP supported the rehabilitation of FCD/FCDI schemes and helped GoB to implement Participatory Scheme Management (PSM), a new approach which focuses on expanding the role of communities in water resources management, including in the identification, feasibility, planning, design, implementation and operation and maintenance of water resources management projects. WMIP also supported capacity building of the Office of Chief, Water Management (OCWM)-within the BWDB, charged with registering WMOs and providing them with regular training and other technical support.

4. **Originally, it had been envisaged that WMIP would rehabilitate and transfer the management of**

about 200 FCD/FCDI schemes to WMOs. However, when cyclones Sidr and Aila hit Bangladesh in 2007 and 2009 respectively, a decision was made to reallocate credit proceeds to support flood damage and rehabilitation works for damaged BWDB schemes. The reduced resource envelope meant that out of the 200 schemes originally planned, only 67 could be rehabilitated and transferred to WMOs.

5. **CSAWMP builds on this progress , but beyond extending rehabilitation and management transfer activities to schemes not rehabilitated under WMIP, and scaling up reforms initiated under WMIP**, based on lessons learned, the project will fund activities directly in support of increased crop and aquaculture productivity, diversification to higher value commodities, enhanced resilience and adaptation to climate change, reduction of GHG emissions from the production landscapes[29], as well as improved marketing of farmer's produce. In many other countries, such an approach has been shown to maximize impact (including the economic value of irrigation water), ensures the achievement of the triple wins offered by CSA, and enhances sustainability of investments and project outcomes. In sum, the project design is based on an integrated approach to agriculture and participatory water resource management with specific interventions related to flood control, drainage and irrigation, improved water management, improved crop and aquaculture management including introduction of CSA technologies for production, post-harvest management and value-addition, and improved marketing to drive the sustained adoption of CSA practices. The project will be organized around four main components as described below.

Component 1: Improved Climate Resilience of Flood Control, Drainage and Irrigation Infrastructure Systems (US$124.82 million, of which IDA US$97.43 million).

6. **The water balance in Bangladesh during different parts of the year is such that flood control and drainage is essential for safe living and sound economic development**. In recent years, the GoB's policy thrust[30] has placed less emphasis on development of new FCD/FCDI schemes, with increased focus on rationalizing existing schemes, mainly because most areas where FCD development would be economically viable, have already been developed.

7. **However, years of inadequate management and deferred maintenance have left the infrastructure in several of the already existing FCD and FCDI schemes in disrepair and derelict condition, thus compromising their effectiveness**. The Project's support under this component will finance the rehabilitation and modernization of select FCD/FCDI scheme infrastructure - identified and prioritized by the BWBD in consultation with relevant stakeholders and local communities to: (i) bring them back to full functionality; (ii) make them more resilient to climate change; (iii) address climate change impacts on water safety; and (iv) create enabling water management conditions suitable for implementing CSA practices. In addition, this component will support the transfer of scheme management to WMOs and deepen and strengthen the institutional reforms already introduced and piloted under WMIP.

8. **In line with the BDP 2100, Adaptive Delta Management (ADM) approaches - combining adaptation and flexibility based on a better understanding of local conditions and future scenarios under a changed climate- will be followed in infrastructure rehabilitation**. Such an approach not only ensures that the rehabilitated infrastructure is resilient and addresses the long-term challenges of flood

[29] While a significant portion of GHG emissions in Bangladesh accrue from livestock, the project will not explicitly focus on improved livestock management for the reduction of GHG emissions as another Bank-financed project, the Livestock Development-based Diary and Meat Project, will address livestock management in the same areas.
[30] As articulated both in the National Water Policy and in the National Water Management Plan.

control, but also limits over - or under- investment in water-related challenges in the selected FCD/FCDI schemes. There are two sub-components under this component as detailed below.

Sub-component 1.1: FCD/FCDI Scheme Rehabilitation and Modernization (US$118.71 million, of which IDA US$91.32 million).

9. **This sub-component will finance rehabilitation of selected FCD and FCDI schemes.** Already, 19 such schemes with a total command area of about 126,200 ha have been identified from a longlist of about 825 BWDB schemes in need of rehabilitation (some of which are shovel ready) following procedures outlined in the Project Implementation Manual (PIM). Selection criteria considered schemes: (i) that are most vulnerable to climate change impacts as deduced from the vulnerability profile of the country's 30 agroecological zones[31]; (ii) range between 1,000 ha to 15,000 ha; (iii) that have high poverty levels; (iv) with existing WMOs or willingness to form WMOs; and (v) that are most cost effective in terms of the cost of rehabilitation per unit area. To leverage rehabilitation as an incentive for improved performance, schemes that already have WMOs established or that have some form of O&M cost recovery in place (i.e., demonstrable evidence of self-help) were prioritized. Under this sub-component, the project's support will go towards feasibility studies, detailed designs, rehabilitation/construction, quality assurance and supervision of the rehabilitation works.

10. **Rehabilitation/modernization will focus on improving the capacity of the infrastructure to modulate the impacts of excess water during the monsoon period on one hand, and water deficits in the post-monsoon period on the other hand as well as on addressing technical hindrances** - at least in some portions of the schemes- that have precluded the possibility of the production of many high-value non-cereal crops under irrigated conditions[32]. Among others, this will include re-sectioning of embankments to incorporate the latest higher flood safety design criteria adopted by BWDB[33]; re-excavation/deepening of canals; improving storage and creation of additional water storage capacity by excavating larger water retention structures to be used as water sources for dry season irrigation and ground water recharge or even as fish sanctuaries; managed aquifer recharge to augment ground water quantities and improve water quality in degraded aquifers; rehabilitation and construction of water control structures; river erosion control/dredging; promoting connectivity (e.g. using culverts and low-head weirs) to allow fish migration and natural recruitment where needed; and other protective works. Since appropriate drainage is crucial to diversification and effective on-farm water management (and also contributes to reduction of methane and nitrous oxide emissions from water logged plots- a climate change mitigation co-benefit), especially immediately after the monsoon ends, the project will also support rehabilitation of drainage canals and remodeling sluices for quick and early drainage. In addition to irrigation needs, construction of pump houses and installation of new pumps for drainage purposes will also be explored. For the purposes of improved and effective on-farm water management, the project will support installation of small infrastructure such as small culverts, turn outs, field channels, and distributary boxes.

[31] A.H. Ahmed and G. Hussain, 2009. Climate Change and Livelihoods: An Analysis of Agroecological Zones of Bangladesh. Center for Global Change. www.researchgate.net/publication/265729300_Climate_Change_and_Livelihoods_An_Analysis_of_Agro-ecological_Zones_of_Bangladesh.

[32] For example, by introducing water management systems that allow rice and non-rice crops to be grown within the same irrigation service units as well as addressing other service demands from changing on-farm practices.

[33] Following unprecedented floods and erratic rainfall in 2017, BWDB has raised its design flood frequency return period to 1 in 100 years (previous return period was 1 in 25 years, as adopted in 1960s) for medium/minor rivers, and 1 in 200 years (previously 1 in 50 year) for major rivers and coastal embankment construction.

Sub-component 1.2: Management Transfer and Capacity Building of BWDB and WMOs (US$6.11 million, all IDA).

11. **According to GoB's Participatory Water Management Regulations 2014 (PWMR 2014), subsequent to the completion of scheme rehabilitation and successful trial operations, management of the BWDB schemes (based on size) is transferred to WMOs**. Transferring scheme management to WMOs, especially under the appropriate policy and legal framework and when capacity exists and ownership and responsibilities are well defined, is global best practice as it has been shown to incentivize good performance and participation by beneficiaries in O&M. This sub-component will finance participatory and community mobilization aspects in support of FCD/FCDI scheme management transfer and the involvement of communities in scheme operations and (routine) maintenance (O&M)[34,35] in line with the PWMR, 2014. This will include support to establishment and strengthening of WMOs for collective action; development of catchment/sub-catchment level O&M plans; training WMOs on infrastructure O&M, water resource management to enhance efficiency (water allocation, scheduling and distribution, and water saving techniques), planning and budgeting for O&M; preparation of scheme- based climate change adaptation plans; and managing trade-offs and resolving conflicts over timely drainage as well as subsequent water use. The management transfer of 100 percent operation and routine maintenance of water infrastructure will be done through a standard agreement signed between BWDB and WMOs. The success of this integrated approach is a sequential and gradually evolving process, and the lessons learned during implementation of the first batch of schemes will be incorporated into the subsequent batches. Details on the process of WMO formation and strengthening are provided in the PIM, and in line with GoB's position, 30 percent of WMO management positions will be reserved for female members.

12. **In a sign of continued commitment to the reforms initiated under WMIP, the government has further strengthened the OCWM (the office responsible for promoting establishment, registering, capacity building as well as providing other technical support to WMOs)** - with 65 additional staff to extend OCWM coverage and oversight across all the BWDB zones. The project will support the training and capacity building of the new staff in their roles as well as other relevant BWDB staff (e.g. staff of the BWDB Audit Directorate, which is responsible for conducting audits of all WMOs) to help transform BWDB into an organization of the future for climate resilient water management in Bangladesh. While capacity building will take the form of hands-on training and experience sharing and learning from best practices in other countries (e.g. through twinning arrangements), the exact nature and scope of capacity-building support will be based on a capacity assessment to be finalized in the first year of the project. This approach will ensure that current government proposals for capacity building are rationalized and appropriately implemented.

Component 2: Climate-Smart Agriculture and Fisheries Production and Marketing (US$19.71 million, of which IDA US$17.05 million).

13. **Taking advantage of the improved and more favorable water regime** (in terms of controlled floods in the monsoon season, early drainage immediately after monsoon, and improved water

[34] As per provisions of the National Water Policy (1999), ownership of the schemes over 1000 ha remains with the BWDB and so is the responsibility for major maintenance activities, which are beyond the financial capacity and skills of WMOs.
[35] There are a couple of pumped irrigation schemes included in the project. The project will pilot handing over the operation of small pumped irrigation facilities to the WMOs with the responsibility of paying for the operation and maintenance cost of the pumps (fuel payments or solar panel costs, small maintenance works, and pump operating staff cost etc.). If successful, this approach would be replicated in other larger pumped irrigation schemes.

availability in the dry season) accruing from the rehabilitation of FCD and FCDI infrastructure under Component 1, the project's support under Component 2 will focus on increasing agricultural productivity and strengthening farmer's capacity to cope or adapt to other climate change stresses affecting agriculture and inland fisheries. The project's support will focus on increasing the productivity, marketing/profitability and resilience to climate change of both agriculture and fisheries systems associated with the rehabilitated schemes while also pursuing opportunities for reducing GHG emissions from these production systems. This is a significant departure from WMIP and is meant to improve farmers' adaptive capacity, incomes and livelihoods as well as the overall value of agricultural output from the rehabilitated FCD/FCDI schemes which would not only justify the costs of FCD/FCDI rehabilitation, but would also improve the prospects of sustainability of investments under Component 1. In addition to supporting improvements in crop productivity and resilience of crop-based production to climate stresses, under this component, support will be provided to improving productivity and resilience of fisheries systems in the FCD/FCDI schemes. This support to fisheries is in line with the imperative to more rapidly diversify Bangladesh's agriculture (to meet changing demand, improve nutrition and adapt to climate change),[36] the livelihood strategies (based on mixed production of crops and fish) for most of the households in the FCD/FCDI schemes, and the need to support the landless (who by some estimates can be up to 50 percent of the population in an individual scheme) for whom fisheries is a major source of livelihood. The project's support to the improved marketing of both crop and fisheries products is meant to increase profitability of CSA technology adoption under both enterprises so as to ensure their increased and sustained use. Support under this component will be through two subcomponents as described below.

Sub-component 2.1: Support to Climate-Resilient Crop Production and Marketing (US$9.98 million, of which IDA US$8.72 million).

14. The objective of this sub-component is to promote: (i) improved crop and on-farm agricultural water productivity; (ii) increased crop diversification towards high-value crops (e.g. fruits and vegetables); (iii) improved crop marketing to increase incomes and reduce price risks associated with diversification[37] away from the rice crop, and incentivize adoption of CSA practices; and (iv) mainstreaming climate change adaptation and mitigation considerations and measures in the crop production, processing/storage and marketing activities of beneficiary farmers.

15. **The project's support will go towards funding the demonstration and adoption of technology options for sustainable crop intensification and resilience to climate change**, all based on the same principles of good choice of improved germplasm, adequate plant nutrition, effective pest management and response to market demand. A significant amount of such productivity enhancing technologies for various crops already exists in Bangladesh[38] together with adequate extension service coverage by the public sector through the DAE. In this case, the project will support DAE to: (i) mobilize and organize WMO members in Climate-Smart Farmer Field Schools (CSFFS) in order to maximize opportunities for scheme and context-specific technology options; (ii) train CSFFS participants on relevant CSA technologies; (iii) identify and train a cohort of lead farmers (with special emphasis on women) for the

[36] M. Gautam, and R. Faruquee., 2016. Dynamics of rural growth in Bangladesh: sustaining poverty reduction. Directions in Development. Washington, D.C.: World Bank.
[37] The average annual variability of harvest prices around the estimated trend has been found to be as high as 15-40 percent for high-value crops such as fruits, vegetables, and spices, compared with only 5-6 percent for rice.
[38] Also, another Bank-financed project, the National Agricultural Technology Program (NATP-II) focuses on technology generation.

purposes of farmer-to-farmer extension; (iv) train and retool extension agents, especially with respect to CSA technologies and practices[39]; (v) defray the costs of demonstration and training materials, and farmer-to-farmer exchange visits, where necessary; and (vi) finance adoption of CSA technology e.g. labor saving fertilizer applicators necessary to reduce drudgery associated with improved fertilizer management for reduced methane emissions under rice production. In general, project financing for CSA technology adoption as well as beneficiary selection will follow guidelines and procedures acceptable to the Bank as will be articulated in the PIM.

16. **To maximize on-farm water productivity and climate resilient water management, especially in the dry season, deliberate efforts will be undertaken to demonstrate and promote the adoption of improved agricultural water management technologies** including more reliance on deficit irrigation techniques; use of high efficiency irrigation technologies such as drip irrigation, sprinklers, micro-irrigation, year-long cropping pattern towards adaptation to climate change, and shifts to less water demanding crops (especially away from Boro rice) or conversion to crops with higher economic value or productivity per unit of water consumed as will be dictated by the uniqueness of specific schemes[40].

17. **The project will also support diversification of the cropping systems at the FCD/FCDI scheme level** with the view of catalyzing a prudent shift from the predominantly rice-based cropping systems to a more desirable crop share allocated between rice and high-value crops. This is in line with recent analytical work which shows that crop diversification in Bangladesh is critical to resilience of production to climate change and to attaining faster productivity, income growth, nutritional security, and reducing the environmental footprint of Boro rice (which mainly relies on the increasingly scarce groundwater resources), among others. In this respect, the project will provide funding for several activities, including but not limited to: (i) awareness creation of diversification among farmers; (ii) farmer experimentation with new crops and training/demonstration of relevant production technology; (iii) assuring availability and access to seeds and germplasm and other critical inputs for the new crops e.g. through partnerships with agro-dealers; and (iv) postharvest management/quality control. The project's support to crop diversification will be based on agronomic/agro-ecological suitability, scheme comparative advantage, and local, national or international market opportunities. The project will place special emphasis on supporting women to engage in productive activities that require very little land, such as homestead gardens, and the production of seedlings and other planting materials for sale. In this case, support will be provided for organizing and training eligible women on production and marketing aspects of identified activities as well as for requisite input sourcing.

18. **The project financing for improved crop marketing will follow the same approaches being used under the ongoing NATP-II** and will include support to: (i) market intelligence/assessments/information systems; (ii) capacity enhancement of selected value chain actors; (iii) value addition; (iv) promotion of alliances between producers and the private sector; (v) cooperative produce marketing; and (vi) infrastructure investments (e.g. collection, washing and grading points, and improvements to physical infrastructure in rural markets and Upazila cooperative markets) where reliable systems of post-project ownership, management and sustainability are clear and acceptable to the Bank. Special efforts will be undertaken to foster the emergence of women traders and entrepreneurs (e.g. through creating women's sections in markets[41] to provide safety, hygienic conditions, and solidarity in an environment

[39] The proposed training will be provided through the Training Wing of the DAE.
[40] In this regard, the Integrated Water Management study (2016) on 'State of Water Resources' done for the Water Planning Resources Organization (WARPO) for each Upazila will serve as input into cropping decisions.
[41] And creating awareness among women, about the existence of such facilities.

where women are still uncommon as buyers or sellers), and the involvement of women in market management.

19. **The project activities in support of improved productivity, diversification and marketing will deliberately pursue, prioritize, and promote technologies and practices with a potential to offer high climate change adaptation and mitigation dividends.** Most of these technologies and practices and the specific production systems and regions to which they are relevant[42], the degree of adoption or mitigation they offer, adoption costs relative to impact etc., are known and are summarized in the Bangladesh CSA Country profile[43]. Among others for example, these include: (i) use of submergence-resistant, and short duration high-yielding varieties for Aman rice (adaptation); (ii) use of solar/biogas in lieu of diesel powered irrigation pumps (mitigation), salinity-resistant varieties (adaptation) and proper use of fertilizers, in terms of right timing, placement, source and amount (mitigation), alternate wetting and drying irrigation for Boro rice (adaptation and mitigation); (iii) direct seeding and use of lodging-resistant varieties for Aus rice (adaptation); (iv) use of salinity and drought-resistant varieties for spices (adaptation); (v) use of floating beds on water bodies for vegetable production (adaptation); (vi) use of dwarf and early maturing varieties for wheat (adaptation); (vii) conservation agriculture for maize (adaptation and mitigation); (viii) reliance on short-duration varieties for pulses (adaptation); (ix) aerobic treatment of manure to reduce methane production (mitigation); and (x) water management in paddy fields to reduce methane emissions (mitigation). Project support will mainly deal with removing barriers to adoption of the above technologies including those related to limited awareness, knowledge and technical information, labor constraints (e.g. through introduction of labor-saving technologies) and lack of appropriate inputs (e.g. seeds and germplasm of resilient crop varieties). In this respect, the project will rely on market opportunities for produce as the ultimate guarantor of CSA adoption. Priority will be accorded to technologies that do not increase the workload for women beneficiaries. Where relevant, the project will support the sourcing of new promising adaptation and mitigation technology including for adoptive trials.

Sub-component 2.2: Support to Climate-Resilient Fisheries Production and Marketing (US$9.73 million, of which IDA US$8.33 million).

20. **The fisheries sector generally, is of great importance in Bangladesh in terms of its contribution to food security, nutrition, job creation, economic growth and poverty reduction.** Fish is an important animal-source food in the diet of millions, both in terms of quantity – accounting for approximately 60 percent of animal protein intake – and frequency of consumption, far exceeding that of any other animal-source food. According to the Bangladesh Economic Review 2019, the sector contributed around one-fourth (25.72 percent) to agricultural GDP and 3.5 percent to national GDP. In addition, more than 12 percent of Bangladesh's total population, including 1.4 million women, is engaged in the sector on full time and part time basis for their livelihoods, and the sector is also a key foreign exchange earner for the country.

21. **Improved fisheries performance is extremely important in this context as it is emerging as a key means to fill the fish output gap left by the declining inland open water fish production** over the last three decades[44] – itself, a function of various anthropogenic factors such as, over fishing,

[42] Generally, climate-smart agricultural practices are location-specific.
[43] https://cgspace.cgiar.org/rest/bitstreams/144796/retrieve.
[44] In 1986, inland capture fisheries and aquaculture contributed 56 percent and 18.2 percent, respectively to total fish production. By 2015, the respective contribution to total production was 28 percent and 56 percent, for inland capture and

implementation of FCD programs, expansion of rice crop areas by drying up shallow water bodies, and improper use of agrochemicals in crop production. However, climate change and extreme weather events in Bangladesh severally continue to negatively impact aquaculture production mainly through physical destruction of facilities, inundation of ponds, loss of stock, spread of disease, increased uncertainties in supply of fresh water (mainly because of pollution from increased agrochemical-infested runoff and salinity intrusion for schemes proximal to the coastal belt), and increased competition, parasitism and predation because of altered local ecosystems, etc. Equally, in some places, aquaculture, it is envisaged, will be a key climate change adaptation measure to provide alternative livelihood means for land-based cropping activities that may no longer be possible and/or cost effective due to for example, increased magnitude and intensity of flooding, waterlogging, and salinity intrusion.

22. **The project's support under this sub-component will go towards financing interventions that seek to improve the productivity and resilience of inland fisheries systems**- associated with the rehabilitated FCD/FCDI schemes - to climate change[45]. Among others, the project will support the mobilization, formation and strengthening of Community-Based Organizations (CBOs),[46] bringing together beneficiaries with a common interest in fisheries, as the platform for promoting improved fisheries production and marketing. Through the CBOs, support will be provided for several purposes including, but not necessarily limited to: (i) deepening cooperatively "owned"/leased and managed *Beels* and *Ghers* and raising associated dykes under Component 1 to protect them from more frequent flooding associated with increasing rainfall as a result of climate change; (ii) improved access to reasonably priced fingerlings of desirable quality (e.g. through support to and regulation of local private hatcheries, establishment of nurseries, purchase of fingerlings, and improved brood stock management); (iii) promoting the conservation of indigenous species, as an autonomous climate change adaptation strategy; and (iv) disease control and management.

23. **Where deemed applicable and feasible, the project will promote integrated rice-fish farming**, a management option that has variously been proven to be superior to rice monoculture in terms of resource utilization, productivity, and both the quality and quantity of the food produced.[47] Besides reducing overall water needs in the production of rice and fish, the integration of rice and fish production is a climate change adaptation strategy as it diversifies the production system thereby reducing the risk of complete production failure. In addition, the system has been shown to maintain or improve the soil carbon stock[48], a major climate change mitigation co-benefit.

24. **The project will also support cage farming and pen culture in suitable waterbodies mainly for the benefit of the landless and the poor**. Successful models for cage and pen culture already exist in Bangladesh and in this case, the project will support the poor to secure rights of access to waterbodies, acquisition of relevant infrastructure, e.g. bamboo cages, nylon netting, fingerlings, and provide training on planning and siting of cage/pen aquaculture facilities, appropriate feeding and management practices. To redress gender inequities which have usually seen women relegated to lower value

aquaculture.

[45] This project focuses on inland aquaculture. Another Bank-financed operation, the Bangladesh Sustainable Coastal and Marine Fisheries Project, provides support to coastal aquaculture.

[46] In most cases, the CBO, it is expected, will be a fisheries subgroup under the WMO.

[47] N. Ahmed, and S.T. Garnett., 2011. Integrated rice-fish farming in Bangladesh: meeting the challenges of food security. Food Security, DOI 10.1007/s12571-011-0113-8.

[48] R.K. Mohanty, H.N. Verma, and P.S. Brahmanand, 2004. Performance evaluation of rice-fish integration system in rain-fed medium and ecosystem. Aquaculture, 23, 125–135.

opportunities in the fisheries value chain, dedicated support will be provided to strengthen women's capacity to engage in all aspects of the value chain. Among others, this will include increasing their access to new technology; information and skills; essential assets such as ponds/other waterbodies and production equipment; productive networks (e.g. market/client connections); and modest funding for inputs like stocking and provision of new species, supplementary feeds, etc.

25. **Because of the expected increases in fish production as a result of project's support, funding will be provided to deal with second generation challenges** associated with increased production of what is a highly perishable product. This will include support to post harvest management and preservation for example, through setting up of cold storage facilities in select local markets, training on quality assurance, improving physical conditions of local markets, aggregation and onward group sale to bigger off-takers, and market information. Twenty FCD/FCDI schemes will be covered under this sub-component.

Component 3: Project Management Support (US$10.78 million, of which IDA US$5.52 million).

26. The objective of this component is to facilitate efficient implementation of project activities and tracking, monitoring and evaluation (M&E), and reporting of results. This component will support operational costs, project M&E and impact assessments, financial and procurement management, communication, and special studies. Under this component, support will also be provided for an interactive voice response (IVR) system to promote effective citizen engagement and community feedback on project interventions.

Component 4: Contingency Emergency Response (US$0.00 million).

27. **This zero-cost component will finance eligible expenditures in case of natural or man-made crises or disasters, severe economic shocks, or other crises and emergencies in Bangladesh**. This contingency facility can be triggered through a formal request from GoB to the Bank through the Economic Relations Division, Ministry of Finance. In such cases, funds from other project components will be reallocated to finance emergency response expenditures to meet the emergency needs. Implementation of this subcomponent will follow a detailed Contingent Emergency Response Implementation Plan (CERIP) satisfactory to the World Bank that will be prepared as the case may be for each Eligible Crisis. Details on the provisions for activating and implementing activities under this component will be finalized as an Annex to the PIM.

ANNEX 3: Implementation Arrangements and Support Plan

COUNTRY: Bangladesh
Climate-Smart Agriculture and Water Management Project

A. Project Implementation Arrangements

1. The project implementation will be the joint and shared responsibility of the Ministry of Water Resources (MoWR), Ministry of Agriculture (MoA) and the Ministry of Fisheries and Livestock (MoFL), respectively working through their implementing agencies BWBD, the Department of Agricultural Extension (DAE) and the Department of Fisheries (DoF). Each implementing entity - BWDB, DAE and DoF – will take the lead on project elements under their respective institutional mandate, capacity and skills endowment. In this case, BWDB will take the lead on activities related to project Component 1 (Climate-Smart Agricultural Production and Marketing); DAE will be the lead entity on subcomponent 2.1(Climate-Smart Agricultural Production and Marketing); while activities targeting the improvement of aquaculture production as defined under subcomponent 2.2 (Support to Climate-Resilient Fisheries Production and Marketing) will be led by the DoF.

2. There will be a Project Coordination Unit (PCU) at BWDB charged with overall coordination across all project activities. The PCU will be headed by a Project Coordination Director and will be staffed with a Procurement Specialist, Finance Management Specialist, and M&E experts. The DAE and DoF will each establish a Project Implementation Unit (PIU) responsible for implementation of their respective components and coordinating with the PCU. Each of the PIUs will be headed by a Project Director (PD) and will also be staffed with a Procurement Specialist, Finance Management Specialist, and M&E Specialist. Both the PCU and PIU will be established within one month of project effectiveness. Short-term Technical Assistance/consultancy services will be sought to fill specific skill gaps during project implementation, as need arises.

3. A Project Steering Committee (PSC) with representation from different ministries/agencies (as per GoB directive) will be established to provide overall policy guidance during project implementation. The PSC will include members from MoWR, MoA, MoFL, Ministry of Land, Ministry of Local Government, Rural Development and Cooperatives, Irrigation Wing of Planning Commission, Implementation Monitoring and Evaluation Division (IMED) and ERD and will have the Senior Secretary/Secretary, MoWR as its Chair. The PSC will meet at least twice a year to review overall implementation progress and PCU will serve as its Secretariat. To ensure a fully integrated approach to implementation as envisaged in the design, there will be a PIC overseeing the project technical functions including reviewing and integrating workplans and budgets, and reconciling tensions between crop and aquaculture land uses as is anticipated in some schemes. The PIC will be chaired by the Directors General of BWDB, DAE, and DoF on a rotational basis.

B. Fiduciary

Financial Management

4. Based on the assessment of prevailing country system, fiduciary capacity of BWDB, DAE and DOF, and the implementation experience of Bank-financed projects with these agencies, the residual FM risk is rated moderate. Specific actions to improve capacity and internal controls, and thereby mitigate FM-

related risks will need to be taken by the implementing agencies. These include:

- Appointment of experienced FM consultants at all PIUs (with ToRs acceptable to the Bank) along with adequate staff to support such functions in cost centers. All consultants and staff with fiduciary duties will be provided regular training to ensure compliance with necessary requirements;
- Mainstreaming Integrated Budgeting and Accounting System (iBAS++) with separate Budget and Accounts Classification System (BACS) codes for fund flow (CSAWMP fund component agreement) budgeting and accounting (economic sub-category and line-items), and preparation of quarterly interim un-audited financial reports (IUFRs).
- Risk-based internal audits with ToRs acceptable to the Bank.

5. Detailed fiduciary arrangements and internal controls will be spelled out in the PIM.

6. **Funds Flow, Budgeting and Accounting:** The project will be included in the BACS as a 'scheme' for the DPPs of respective Ministries to be determined under the operational segment for release of the allocated annual budgets to the PIUs. Budget preparation and execution will take place electronically using iBAS++ to facilitate timely release of funds for project execution. There will be three separate Designated Accounts (DA), in each PIU, in the form of Convertible Taka Special Account (CONTASA), which will be opened with a nationalized commercial bank to receive the credit funds for implementation of the relevant components of the Project. IDA funds will flow to the DAs based on submission of withdrawal applications, in the Client Connection, by the authorized signatory for the project. An alternative signatory arrangement will be made for submission of withdrawal applications to ensure unhindered flow of funds for project execution. The disbursement applications, to be submitted to the Bank, will be based on actual Statements of Expenditures (SOEs), incurred by the Project. The PCU in BWDB and the PIUs in DAE and DoF will be responsible for submitting the disbursement applications as often as once per month.

7. Each PIU will send yearly cash flow projections by June 30 of each year and this projection will be updated on a quarterly basis. Separate sets of accounts using BACS would be maintained in iBAS++ for each financing to ensure charging of expenses related under the appropriate financing. The project will prepare a separate Interim Unaudited Financial Report (IUFR) from iBAS++, in formats agreed with the Bank, on a quarterly basis and submit to the World Bank for review and clearance within 45 days from the end of each quarter.

8. **Disbursements and Flow of Funds:** The project will start with transaction-based disbursements and may convert to IUFR-based disbursements upon demonstrating the capacity to prepare reliable and timely financial reports. Funds (in BDT) will be disbursed through three separate Designated Accounts (DA). Counterpart financing of US$35.31 million will flow to the project as parallel financing, which will include land acquisition, costs that are not eligible under the existing country financing perimeter such as purchase of vehicles; recurrent expenditures such as workshop allowances, sitting allowances, cash per diems, honoraria and fuel; and customs duty-value added taxes and other taxes beyond 15 percent of total IDA allocation. No grants or funds transfer to other entities are contemplated and any flow of funds to WMOs will be based on contracts.

9. **Audit and Oversight Arrangements:** The PCU and each PIU will prepare the project Annual Financial Statements that will be submitted to the Comptroller and Auditor General's Office (CAG) of Bangladesh within three months of the end of each fiscal year. The annual audit will be conducted by

the Foreign Aided Projects Audit Department (FAPAD) under the OCAG (Office of Comptroller and Auditor General). FAPAD will express an opinion on the project financial statement in accordance with international standards of auditing and submit the report within six months of the end of the fiscal year. In addition, the auditor will be required to provide a detailed management letter containing observations on internal controls and compliance with financial covenants in the Financing Agreement. The PCU and PIUs will be responsible to provide clarifications on possible audit observations within 30 days from the receipt of the report. They will also ensure resolution of the audit observations on a timely manner by no later than 90 days from the receipt of the final audit report. Resolution of audit observations may include recertification, actions and refunds of the public money under question.

10. Additionally, a risk-based internal audit by an independent audit firm will be performed each year over the project term. Currently, there is no outstanding audit reports of the implementing agencies. As per FM records of the Bank, there is no pending/overdue audit report by the Implementing Ministry for any ongoing /completed Bank financed project.

Procurement

11. **General:** Procurement will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers, July 2016, revised November 2017, August 2018 and November 2020, and the provisions of the Project Procurement Strategy for Development (PPSD) and procurement plan that may be updated from time to time with the Bank's approval. The project will be subject to the World Bank's Anticorruption Guidelines, dated October 15, 2006, revised in January 2011, and July 1, 2016. The project will use the Systematic Tracking of Exchanges in Procurement (STEP) to plan, record and track procurement transactions.

12. **Procurement Responsibility:** The PCU at BWDB will process all the goods and services procurement and the works procurement will be managed by the respective field units of the BWDB with review support from the PCU. The PIUs at DAE and DoF will process all procurements for their respective implementing agencies centrally. In addition, very small on-farm water management infrastructure will be constructed by the agencies using community driven development (CDD) approach. Procurement will involve goods, works, non-consulting and consulting services. Specific procurement activities will include: rehabilitation and modernization of select FCD/FCDI scheme infrastructure including re-sectioning of embankments, re-excavation/deepening of canals, excavation of larger water retention structures, rehabilitation and construction of water control structures, river erosion control/dredging and other protective works, construction of pump houses and installation of new pumps, construction of irrigation related infrastructure, establishment of fisheries related structure (e.g. Post-Harvest Fish Service Center), procurement of agricultural related equipment, training and capacity building, development community database etc.

13. **Procurement Capacity and Risks:** A detailed procurement capacity assessment carried out for BWDB, DAE and DoF indicates 'Substantial' residual risk in procurement operations and contract management. While BWDB and DAE have experience and capacity in processing Bank financed procurement, DoF has limited experience in Bank financed projects.

14. **Risks and Mitigation Measures:** The key risks that the project may face include: (i) delays in processing procurement; (ii) lack of knowledge in the Bank's Procurement regulations; (iii) lack of expertise on contract management; and (iv) delays due to the requirement of the Board approval for majority of the procurement transactions for BWDB. In order to minimize the procurement associated risks, a number of mitigations measures will need to be taken which include:

(a) Development and use of a Project Procurement Strategy for Development (PPSD) by the implementing agencies (acceptable to the Bank) taking into account the volume of items to be procured, prevailing market conditions, activity level risks etc. The PPSD outlines the appropriate procurement strategy for the project. Initial procurement plans have been developed as part of the PPSD. A PPSD has been developed along with initial procurement plan for all the agencies. It will be modified and updated as and when necessary;

(b) Use of Systematic Tracking of Exchanges in Procurement (STEP) system to prepare and manage the procurement plan and all procurement transactions. The procurement plan will be updated at least semi-annually (or as required) using STEP system;

(c) Appointment of experienced procurement consultants (with ToRs acceptable to the Bank) along with adequate staff to support such functions;

(d) Formation of bid/proposal evaluation committees having the necessary expertise depending on the type of contract and with the membership of procurement consultant;

(e) Use of National e-Government Procurement (e-GP) for contracts to be procured using request for Bids (Open-National). Other contracts, e.g., international bidding, consulting services, will also use e-GP, whenever these are operational in the e-GP system of the country;

(f) Training of project officials including evaluation committee members on Bank Procurement Regulations, country procurement laws, STEP and other aspects of procurement;

(g) Use of the Bank's Standard Procurement Documents (SPD) for goods, works and non-consulting services where international competition is required and Standard Request For Proposals (SRFP) for consulting services, including their respective forms of contract. For all other procurement, Model Tender Documents (MTD) agreed with the Bank would be used;

(h) Carrying out of procurement post reviews at least annually of a sample of contracts completed under the project selected depending on the associated risks; and

(i) Other due-diligence measures including: (a) verification of recommended bidders' post-qualification information during bid evaluation; (b) making bidders aware about fraud and corruption issues in writing and/ or at pre-bid/ proposal meetings, as applicable; (c) preserving all procurement related documents to facilitate smooth post procurement reviews; and (d) publishing contract award information at the Central Procurement Technical Unit (CPTU) and the respective agencies website within two weeks of contract award (and in UNDB online for international contracts).

15. **Procurement Plan:** The Procurement plan will include estimated costs, procurement methods, contract arrangements, prior review requirements, processing timeframe, among other relevant information. Procurement plan and its revisions will need the Bank's review and approval. A General Procurement Notice (GPN) would be published on the Bank's website and the UNDB Online once the project is approved.

C. Project Implementation Support Plan

Strategy and Approach for Implementation Support

16. The project Implementation Support Plan is informed by: (i) lessons accruing from past Bank projects in Bangladesh; and (ii) the risk profile as presented in the Systematic Operations Risk-Rating Tool (SORT).

17. A number of ex-ante risk mitigation and control measures are already part of the project design and therefore, this plan mainly focuses on provision of appropriate technical guidance through frequent missions and ex-post reviews. The objective is to offer timely, flexible and efficient implementation technical support to the GoB as well as help mitigate residual risks-especially those rated as high or substantial in the SORT. The strategy also encompasses the standard areas of support focus including safeguards and fiduciary aspects. The strategy will be periodically reviewed and revised as deemed appropriate.

Implementation Support Plan

18. There will be two comprehensive implementation support missions per year and these will focus on: (i) assessing implementation progress for each of the project components including the links between project activities, outputs and envisaged outcomes; (ii) providing solutions to any project implementation bottlenecks; (iii) reviewing together with the implementing agencies and their partners, the six month work plans and budgets; (iv) reviewing project fiduciary aspects including disbursement and procurement; (v) ascertaining and confirming that project activities are carried out in compliance with the agreed environmental and social safeguard procedures; and (vi) technical aspects especially those related to the modernization of FCD/FCDI schemes, participatory water management, promoting adoption of CSA technologies, and produce marketing.

19. There will also be a Mid-term Review (MTR) approximately halfway through implementation to take stock of implementation progress, and to assess performance against the agreed set of indicators and milestones. The MTR will also provide an opportunity to reassess major design features-if necessary- to enable attainment of project objectives. At the end of the project, an independent assessment will be undertaken, and lessons drawn to inform future or similar operations. In addition, both the client and the Bank will conduct reviews to provide a complete and systematic account of the performance of the project and to draw lessons for future investments. Briefly, the plan with respect to technical, fiduciary and safeguards support is as outlined below.

20. ***Technical support:*** The Bank will mobilize and assemble an appropriate technical skills mix needed to support implementation of the project. This team will include experts from the Food and Agriculture Organization (FAO) and Consultative Group on International Agricultural Research (CGIAR) centers to bring in new knowledge on various climate change aspects.

21. ***Safeguards support:*** The environment and social specialists will support relevant counterpart staff in applying the agreed safeguard instruments as well as reviewing compliance and will also provide any capacity building support, where necessary. The envisaged focus of the social supervision will be on resettlement, participation, inclusion and equity, while the environmental supervision will focus on the implementation of the PMP, EMPs.

22. ***Financial management support***: The team will require that quarterly IUFRs be submitted to the World Bank as well as the annual external audit report for review. Once every 12 months, the Bank will review other project-related information as well, such as the internal control, oversight, and reporting systems. Monitoring of actions taken on issues highlighted in audit reports, auditors' management letters, internal audit and other reports will be done as need arises. The Bank will also provide training to project FM specialists to strengthen their capacity. The following are the planned supervision and implementation support measures due to travel limitations for COVID-19 Pandemic: (i) virtual FM implementation support activities to keep engaged with implementing teams on issues impacting performance, compliance and reporting; (ii) electronic exchange of FM documents and accounting

evidence; (iii) virtual meetings and discussions; (iv) Third-party verification for questionable and ineligible expenditures.

Table A3.1: Main focus of support to project implementation

Time	Focus	Skills Needed	Resource Estimate
First 12 months	• Effectiveness/start of project activities • Finalization of ToRs and procurement of specialized TA for proposed activities • Preparation and approval of bidding documents for hydraulic infrastructure rehabilitation • Compliance with relevant safeguards policies • Scheme design and DPR preparation	• Agriculture Specialist (TTL) • Water Resource Specialist (co-TTL) • Hydrologist • Agriculture Marketing Specialist • Fisheries Specialist • Procurement Specialist • Financial Management Specialist • Social Safeguards Specialist • Environment Safeguards Specialist	200,000
12-60 months	• Implementation of planned activities and preparation of Annual work plans and budgets • Detailed scheme design • Results monitoring against set targets • Fiduciary and safeguards compliance • MTR • Project completion and ICR preparation	• Agriculture Specialist (TTL) • Water Resource Specialist (co-TTL) • Hydrologist • Agriculture Marketing Specialist • Fisheries Specialist • Procurement Specialist • Financial Management Specialist • Social Safeguards Specialist • Environment Safeguards Specialist	200,000 per annum

Skills Mix Required

Skills Needed	No. of Staff Weeks	Number of Trips	Comments
• Agriculture	4	2	
• Agriculture Marketing	3	1	
• Climate Change	4	2	
• Water Resource Management	2	2	
• Hydrology	4	2	
• Procurement	2	2	
• Financial Management	2	2	
• Safeguards	2	2	
• M&E	2	2	

ANNEX 4: Greenhouse Gas Accounting

COUNTRY: Bangladesh
Climate-Smart Agriculture and Water Management Project

1. **Corporate mandate**. The World Bank has adopted, in its 2012 Environment Strategy, a corporate mandate to conduct greenhouse gas (GHG) emissions accounting for investment lending in relevant sectors. The ex-ante quantification of GHG emissions is an important step in managing and ultimately reducing GHG emission, and it is becoming a common practice for many international financial institutions.

2. **Methodology.** To estimate the impact of agricultural investment lending on GHG emission and carbon sequestration, the World Bank has adopted the Ex-Ante Carbon-balance Tool (EX-ACT), developed by FAO in 2010. EX-ACT allows the assessment of a project's net carbon-balance, defined as the net balance of CO_2 equivalent GHG emitted or sequestered as a result of project implementation compared to a without-project scenario. EX-ACT estimates the carbon stock changes (emissions or sinks), expressed in equivalent tons of CO_2 per hectare and year.

3. **Project boundary and key assumptions**

a) Cropping areas of annual crops and flooded-rice systems technical management and mitigation options will change substantially during project implementation. Table A4.1 presents the details.

Table A4.1. Annual and Flooded Rice Systems

Cropland	Area (ha)			Key Assumptions
	Start	Without	With	
Non-flooded rice	25,308	25,308	17,309	Cropping area to be reduced to preserve groundwater, nutrient management, water management and manure application introduced and improved, residue retention instead of burning.
Vegetables	11,504	11,504	14,380	Improved crop cultivation techniques will be introduced, particularly improved agronomic practices, water and nutrient management.
Wheat	3,835	3,835	4,721	Improved crop cultivation techniques will be introduced, particularly improved agronomic practices, water and nutrient management, residues to be retained rather than burned.
Pulses	959	959	2876	Improved crop cultivation techniques will be introduced, particularly improved agronomic practices, water and nutrient management.
Jute	6,711	6,711	5,752	Improved crop cultivation techniques will be introduced, particularly improved agronomic practices, water and nutrient management, as well as reduced to no till and residue retention.
Potatoes	7,669	7,669	8,628	Improved crop cultivation techniques will be introduced, particularly improved agronomic practices, water and nutrient management and manure application, residue retained rather than exported.
Maize	1,917	1,917	3,835	Improved crop cultivation techniques will be introduced, particularly improved agronomic practices, water and nutrient management, as well as reduced to no till and residue retention, no more residue exporting.

Flooded-Rice	37,963	37,963	38,366	Flooded pre-season (>30 days) to be replaced by non-flooded preseason (<180days).

b) Inputs into agricultural production are largely limited to fertilizer and pesticides. Annually the project will use 11,442 metric tons of fertilizers (including phosphorus and urea) and 15 metric tons of compost, and 120 tons of pesticides (herbicides and fungicides). Table A4.2 presents the details.

Table A4.2. Annual agricultural inputs (tons)

	Before Project	Without project	With project
Urea	7,084	9,431	6,935
Compost	7	8	15
Phosphorus (P_2O_5)	5,119	6721	4,507
Herbicides (Butachlor)	49	59	78
Fungicides (Mancozeb)	1	2	5

c) Annual aquaculture production is expected to almost double to 11,840 metric tons, and consequently, so will annual feeds for aquaculture to 15,900 metric tons. Table A4.3 presents the details.

Table A4.3. Coastal Wetlands and Aquaculture production and feed (tons per annum)

	Before Project	Without project	With project
Annual production	6,705	4,693	11,844
Annual feed	6,223	5,393	15,903

4. **Regional and project characteristics.** The project region (which is the entire national territory) has a tropical moist climate. The dominant soil type is Wetland Soils. The project implementation phase is 5 years of actual implementation and the capitalization phase is assumed to be 20 years. The 25-year implementation period is common in the use of EX-ACT.

5. **Results.** The net carbon balance quantifies GHGs emitted or sequestered because of the project compared to the without-project scenario. Over the project duration of 20 years, the project constitutes a carbon emission savings of **6,380,614** tCO_2-eq, equivalent to **255,224** tCO_2-eq additionally sequestered per year. See Table A4.4 for a summary of these results.

Table A4.4. Results of the ex-ante GHG analysis

Project activities	Over the economic project lifetime (tCO2 eq)			Annual average (tCO2 eq/year)		
	GHG emissions of "without project" scenario (1)	Gross emissions of "with project scenario (2)	Net GHG emissions (2–1)	GHG emissions of "without project" scenario (3)	Gross emissions of "with project" scenario (4)	Net GHG emissions (4–3)
Land Use Changes						
Other LUC	0	-62,315	-62,315	0	-2,493	-2,493
Crop systems						
Annual	-1,884,040	-3,363,805	-1,479,764	-75,362	-134,552	-59,191
Flooded Rice	-10,260,106	-5,937,666	-4,322,440	410,404	237,506	-172,898
Inputs	2,687,304	2,043,852	-643,427	107,491	81,754	-25,737

Aquaculture	96,841	224,172	127,330	3,873	8,967	5,093
Total	**11,160,185**	**4,779,571**	**-6,380,614**	**-446,407**	**-191,183**	**-255,224**