

Community Climate Change Project (CCCP)

ENVIRONMENTAL MANAGEMENT FRAMEWORK (EMF)

Draft Final

December 2011

Palli Karma-Sahayak Foundation (PKSF)

Government of the People's Republic of Bangladesh

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List of Abbreviation

ASM	Agriculture Sector Microcredit
BP	Bank Procedure
BCCRF	Bangladesh Climate Change Resilience Fund
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BDT	Bangladesh Taka
BECA	Bangladesh Environmental Conservation Act
CCCP	Community Climate Change Project
CGR	Central Grievance Redress
ECR	Environmental Conservation Rules
EHS	Environmental Health and Safety
EMF	Environmental Management Framework
EMP	Environmental Management Plan
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
IGA	Income Generating Activities
LGR	Local Grievance Redress
MD	Managing Director
MEP	Microenterprise Program
MFI	Microfinance Institutions
NGO	Non Government Organization
OP	Operational Policy
PIP	Project Implementation Partner
PKSF	Palli Karma-Sahayak Foundation
PO	Program Officer
RM	Rural Microcredit
SGP	Sub Grant Proposal
SL	Seasonal Loan
UPP	Ultra Poor Program
UM	Urban Microcredit

Executive Summary

Introduction:

Palli Karma-Sahayak Foundation (PKSF) will implement the Community Climate Change Project (CCCP) under the multi-donor trust fund entitled “Bangladesh Climate Change Resilience Fund (BCCRF)”, established for implementing the Bangladesh Climate Change Strategy and Action Plan (BCCSAP). The CCCP will fund community-based adaptation projects focusing on the six pillars identified in the BCCSAP including food security, social protection and health; comprehensive disaster management; infrastructure; research and knowledge management; mitigation and low carbon development; and capacity building implemented by Non Government Organizations (NGOs). The CCCP will receive grant financing from the Bangladesh Climate Change Resilience Fund (BCCRF).

Relevant Government and World Bank Policies:

The document is prepared as per requirement of the World Bank of Project/Program Financing. Since the community funded initiatives/sub grant projects will be identified during the CCCP implementation stage, the environmental impacts of those sub grant projects cannot be assessed during project preparation stage. Accordingly, an Environmental Management Framework (EMF) is prepared which provides general policies, guidelines, and procedures to be integrated into the implementation of all “sub grant projects” under the CCCP. The EMF identifies potential environmental related impacts for subprojects implementation. The purpose of this EMF is to ensure that neither the sub grant project activities (both in terms of needs and quality) nor the environment is compromised through the program intervention. The EMF will facilitate compliance with the World Bank’s environmental safeguard policies and also with the policies, acts and rules of the Government of Bangladesh. The document has reviewed all the relevant policies, rules, strategies of the Government of Bangladesh and the policies of World Bank. According to the present Environmental Conservation Rules (ECR)’97, it is required as per ECR to screen all the sub-projects, further carry out IEE (if required) and take appropriate mitigation measures. As per the World Bank guidelines, the overall Community Climate Change Project falls under the category ‘B’ project. The subprojects with physical interventions will require environmental screening and depending on the findings, partial environmental assessment may be required. As per ECR’97, the overall project category cannot be defined. However, the most of the subprojects will fall under Amber-A and Amber-B category. Any sub project with significant environmental impact will not be funded under CCCP.

Environmental Setting of the Climate Vulnerable Area:

The activities will be mainly focused on the climate vulnerable areas namely: Saline Prone Areas, Flood Prone Areas and Drought Prone areas. The subprojects to be funded under CCCP will be identified and approved during implementation phase of CCCP. Consequently, specific information on types of subprojects, site/location of the sub-projects, land requirements, local communities, geo-physical land features and nature is not available. Therefore, exact detail and baseline information cannot be determined during project preparation. The sub projects will be community scale demand driven to strengthen the resilience due to climatic vulnerability. The implementing NGOs are required to collect the baseline information during the proposal submission stage. The EMF takes into consideration of the agro-ecological zones defined by the

Land Resources Appraisal of Bangladesh under the FAO/UNDP Agricultural Development Adviser Project (BGD/81/035) to understand the characteristics of different zones of Bangladesh. The agroecological zone indicates an area characterized by homogeneous agricultural and ecological characteristics. However, during project preparation, few districts have been short listed in salinity, flooding and drought prone areas based on the population, poverty and climatic vulnerability. In coastal region, target geographic area will cover 6 coastal districts (out of the 19 coastal districts): Sathkhira, Khulna, Bagerhat, Jessore, Pakuakhali and Barguna. In the flood affected area, the project will target Barishal, Cox's Bazar, Jamalpur, Mymensingh, Bagerhat, Jessore, Khulna, Kurigram and Nilphamary. Chuadanga, Jessore, Naogaon, Natore, Sathkhira, and Rajshahi are targeted as the drought prone area. However, the exact locations and the districts may change during project implementation.

Principles of EMF:

The PKSf will follow a set of principles in implementing the CCCP to ensure environmental sustainability of the project. In the view of EMF objectives and assessment of the nature, the planning and implementation of the project activities will be based on the following principles, most of which are incorporated in the project design and implementation arrangements. A set of negative list of sub-projects/activities that will not be financed has also been agreed. Any subproject requiring full environmental impact assessment will not be funded under the project unless there is special community needs for better climate resilience.

Some of the key principles of the environmental management in CCCP are: (i) All the sub projects (Sub-Grant Proposals (SGP) when funded for implementation) to be funded under the CCCP will be subject to an environmental screening and initial environmental examination (IEE) in order to prevent execution of sub grant projects with significant long-term negative environmental impacts and also to plan and implement mitigation measures for less significant environmental impacts. (ii) PKSf will ensure due diligence to the related government rules (laws, ordinance, acts, etc.) and World Bank Operational Policies and guidelines related to environment are being followed in sub grant projects selection and implementation. The EMF would serve as the basis for ensuring the compliance. (iii) No sub projects activities will be carried out in disputed lands or lands restricted for development or Environmentally Sensitive areas. (iv) PIPs will be responsible for obtaining and ensuring clearance required from local government agencies as necessary. (v) Prior to submission of Sub Grant Proposal (SGP), the PIP will undertake community consultation regarding their objectives, scopes as well as environmental safeguard implications.

CCCP will promote environmentally sound design to prevent (i) failure of economic or social development projects due to environmental causes; (ii) damage to the environment which imperils future economic and social development. Environmentally sound design will introduce prevention-based across the project lifecycle.

Environmental Screening and Review:

The 'environmental screening' is a mandatory requirement for the design of a project or subproject. A standard screening format for proposal stage is provided in the EMF. The purpose of the environmental screening is to get relevant concerns addressed early on before further

decision and/or design of a sub grant project and to ensure that actions to mitigate environmental impacts or enhance environmental opportunities are budgeted for. It is the responsibility of the Project Implementing Partners (PIP) to carry out the environmental screening. Screening will go hand in hand with project proposal preparation.

PKSF will employ a full time Program Officer (Environment and Natural Resource Management) at PMU. S/he will be the focal person for environment and will have Environmental Specialization. ‘Potential environmental impacts and quality of environmental screening’ will be one of the criteria of the short-listing of the Sub Grant Proposal. The environmental screening will provide information to PKSF about the nature of the sub- grant proposal at initial stage. PKSF will determine the significance of the environmental effects of the short-listed subproject and can provide the recommendation on alternative measures and key focus areas in initial environmental examination (IEE). The proposed subproject in the environmentally sensitive areas or proposed subproject with significant and long-term environmental impacts will not be recommended. The proposed activities with moderate and localized environmental impacts will be recommended for initial environmental examination (IEE) at the SGP stage. If no environmental issue has been identified in the environmental screening and PKSF is satisfied with the screening results, no further environmental assessment i.e., IEE will not be required for the subproject at the SGP proposal stage.

Initial Environmental Examination (IEE) and Review:

The short-listed Project Implementing Partners (PIP) will prepare the initial environmental examination (IEE) in parallel to SGP development. Since most of the PIPs do not have internal capacity to prepare the IEE, it is recommended that PIP should hire a qualified environmental professional to prepare the IEE. The examples of environmental impacts, possible mitigation measures, standard template for mitigation plan, monitoring plan etc. are available in the document.

After receiving the complete SGP including the IEE report, the Project Coordinator will form an appraisal team. The Program Officer (Environment and Natural Resource Management) will be the appraisal team member. The appraisal will be divided into major steps: i) Concept review phase and ii) Proposal review phase. The team will initially undertake a desk review of the SGP and share their preliminary assessment on environment. The environmental team member will check that IEE report, if necessary. If the proposal does not sufficiently include all information required, the applicant organization may be contacted to furnish with the information to justify a detailed appraisal. The environmental team member will carry out a field visit and focus group discussions with the communities. The quality of the baseline information, identification of potential impacts, effectiveness of the mitigation measures and the adequacy of the mitigation and monitoring plan will be critically reviewed and assessed by the environmental team member.

The World Bank Clearance:

The Project Coordinator will present the SGPs recommended by the Appraisal Team to the World Bank through the Managing Director. The World Bank can ask for further clarification or suggest to strengthen the environmental documentation. In that case, the Project Coordinator will request the respective applicant organization to revise the specific areas related to environmental

documentation. The Project Coordinator will resubmit such a SGPP through the Technical Committee and Managing Director to the World Bank for re-examination.

Environmental Safeguard Supervision and Monitoring: The Project Management Unit (PMU) will have a full time focal person Program Officer (Environment and Natural Resource Management) with Environmental Specialization. The field level PKSF staffs will be trained to supervise the regular implementation of the environmental management activities. Any environmental documents (screening, IEE, mitigation measure and EMP) submitted by the NGOs should be endorsed by an environmental specialist. The NGO will nominate an environmental specialist who will submit the quarterly monitoring report on environmental compliance at project preparation, implementation and operation & maintenance phase.

PKSF will develop its own monitoring plan to oversee environmentally critical sub-project. PKSF appointed Program Officer (Environment and Natural Resource Management) will monitor the environmental safeguard issues in the selected sub-grants and publish annual report on environmental compliance of subprojects. He will maintain a database for sub-project specific environmental screening, and mitigation measures. The project M&E system will capture that information as well. In addition, the project's third party evaluation (reputed local think-tank) will include a brief environmental audit to assess and evaluate the quality of environmental compliance of the subprojects.

Capacity Building:

The project will support the capacity building of the PKSF, PIPs and the communities on better environmental management and practices. Dedicated training and orientation programs have been proposed at different levels.

Grievance Redress System: Environmental Issue will be integrated into the project Grievance Redress System. At the subproject level, the Union Parishod Chairman or his representative will be the Local Grievance Redress (LGR) focal point. At the PKSF central level, the program officer (environment) or the Project Coordinator nominated person will be Central Grievance Redress (CGR) focal point. At each level, there will be a Grievance Redress Register, where complaints are entered petitioners against a receipt. All grievances should ideally be disposed within 15 days. Monitoring and reporting on possible complaints on environment/social issues from community and affected people in the villages will be one of the responsibilities of the CGR focal point.

Consultation and Disclosure: PKSF has prepared the EMF in consultation with some potential NGOs. In addition, field visit were made to understand the environmental concerns of the community due to the on-going projects of PKSF. Since the subprojects under CCCP are yet to be identified, it was not possible to consult with the project beneficiaries or affected persons at this stage. However, the framework is prepared in such way that community consultations during the appraisal stage are mandatory. The EMF along with Bangla summary version will be disclosed by the PKSF on their website and hardcopies will also be available at PKSF headquarters and concerned PIP offices at project area. Advertisement requesting public comments will be published in two daily Newspapers (English and Bangla). The EMF will also be disclosed in Infoshop. The NGO/Project Implementation Partners (PIPs) will make the

hardcopy available at their head and local offices. NGO/PIP will also upload the final versions of the EMF along with the Bangla Summaries in their website, if available.

1.0 Introduction

1.1 Background of BCCRF

1. Bangladesh is one of the most climate vulnerable countries in the world. Rising global temperatures are likely to increase the frequency and intensity of cyclones in the Bay of Bengal as well as monsoon rainfall, resulting in catastrophic floods in the Ganges – Brahmaputra-Meghna Basin. Sea level rise and the consequent saline intrusion into aquifers constitute serious threats.

2. Over the last three decades, Bangladesh has adopted various policies to address climate change. The country has invested in adaptation measures such as, flood management schemes, coastal embankments, cyclone and flood shelters, as well as raising roads and highways and research and development toward climate resilient farming. As a result, Bangladesh’s ability to manage disasters, in particular, floods and cyclones, has improved dramatically since 1991.

3. Nevertheless, the challenges and concomitant investment requirements are enormous. With a view to building a medium to long-term program for enhancing resilience to climate shocks and facilitating low carbon and sustainable growth. The Government of Bangladesh prepared the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2009. This strategy, identifies six pillars: (i) food security, social protection and health; (ii) comprehensive disaster management; (iii) infrastructure; (iv) research and knowledge management; (v) mitigation and low carbon development; and (vi) capacity building.

4. A multi-donor trust fund entitled “Bangladesh Climate Change Resilience Fund (BCCRF)” was established for implementing the BCCSAP. The BCCRF will be managed and implemented by the Government of Bangladesh. A technical assistance portion of the BCCRF will be executed by the World Bank with agreement of the Government of Bangladesh.

1.2 Description of CCCP

5. The BCCRF is designed as a ‘one-stop’ mechanism for large-scale climate change financing in Bangladesh with **two windows**: an on-budget window for funding public sector projects; and, an off-budget window for funding projects from civil society organizations. The Governing Council of BCCRF approved Palli Karma-Sahayak Foundation (PKSF) as the implementing agency for the off-budget window. This off-budget window is named as the Community Climate Change Project (CCCP).

6. The CCCP will fund community-based adaptation projects focusing on the six pillars identified in the BCCSAP implemented by Non Government Organizations (NGOs). The CCCP will receive grant financing from the Bangladesh Climate Change Resilience Fund (BCCRF).

7. The project will have 3 main components: (i) Community climate Change Fund (ii) Knowledge Management and (iii) Project management sub-component.

Component 1: Community Climate Change Fund (US\$10.40 million):

8. This component would establish a US\$10.40 million fund to finance community-based climate change adaptation projects implemented with the assistance of Non-Government Organizations (NGOs). The fund would be managed by Palli Karma-Sahayak Foundation (PKSF) through a separate Project Management Unit (PMU) which would be set up with complete staffing, equipment and operational cost support covered under Component 3 of the project.

9. PKSF will invite project proposals from NGOs to address climate change impacts through a strategic approach, targeting climate change scenarios in three different vulnerable zones namely: (i) salinity affected coastal areas; (ii) flood affected char-lands and river basins; and (iii) drought affected or rainfall scarce areas. Each project proposal must be located within the above vulnerable zones (a list of Upazilas falling in these zones is provided in Annex 2) and must address at least one of the following six pillars of the BCCSAP: (a) improve food security, social protection and health; (b) improve disaster management capacity; (c) climate proof existing infrastructure; (d) improve research and knowledge management to predict the likely scale and timing of climate change in different sectors; (e) explore mitigation and low carbon development opportunities; and (f) focus on capacity building and institutional strengthening. The size of the grant requests would be minimum US\$20,000 and a maximum of US\$ 1 million. Disbursements under all sub-grants must be completed three months before the project completion date of CCCP. The sub-grant proposals will be reviewed also for social and environmental safeguards as per Bank policy including gender and social inclusions. The details of the process by which the decisions to award the sub-grants would be made are in Annex 3 under “Implementation Arrangements”.

Component 2: Knowledge Management (US\$ 0.44 million):

10. Since both climate change and community-based adaptation are new and evolving, this component would promote the sharing of lessons on best practices among the participating NGOs whose adaptation projects are financed under the project, the wider NGO community within Bangladesh as appropriate, and disseminate the findings in regional and global forums also. This component would also support a structured learning process of capturing lessons and incorporating best practices into the design and implementation of interventions related to climate change adaptation, including the preparation of a ‘toolkit’ and guidelines on community based approaches to climate change adaptation and through visits among the communities where the project activities take place in the different vulnerable zones.

Component 3: Project Management, M&E and Capacity Building (US\$1.66 million)

11. This component would finance technical assistance to: (i) finance the staff of the Project Management Unit to be established in PKSF to manage the fund and monitor the implementation of projects. Other items to be financed include the operating costs of equipment, financial

management, procurement, technical assistance, and other expenses to administer the project funds; (ii) build the technical capacity of PKSF to appraise climate change adaptation project proposals submitted by NGOs and operationalize the procedures for fund management outlined in the Operational Manual (see Annex 3 for details); (iii) build the capacity of NGOs to prepare eligible community-based climate change adaptation project proposals; and (iv) operationalize a M&E system to ensure effective monitoring of project outcomes at the project level, at the community level, and by an independent third party to conduct an annual review of the performance of the financing mechanism, a mid-term review, and a comprehensive review and evaluation of outcomes at project completion; and (v) to establish a grievance redress system to handle any issues raised by stakeholders about the implementation of the project.

1.2 Purpose of EMF

11. Since the community funded initiatives/sub projects will be identified during the CCCP implementation stage, the environmental impacts of those sub projects cannot be assessed during project preparation stage. An Environmental Management Framework (EMF) provides general policies, guidelines, and procedures to be integrated into the implementation of all possible “sub grant projects” under the CCCP. The EMF identifies potential environmental related impacts for sub grant projects implementation.

12. The purpose of this Environmental Management Framework (EMF) is to ensure that neither the sub grant project activities (both in terms of needs and quality) nor the environment is compromised through the program intervention. The EMF will facilitate compliance with the World Bank’s environmental safeguard policies and with policies, acts and rules of the Government of Bangladesh. The EMF will contribute the goal of environmental sustainability by:

- enhancing environmental outcomes of the activities implemented under individual “sub projects”;
- preventing and/or mitigating any negative environmental impact that may emerge from the “sub projects”;
- ensuring the long-term sustainability of benefits from “sub projects” by securing the natural resource base on which they are dependent; and
- facilitating pro-active “sub projects” that can be expected to lead to increased efficiency and improved management in the use of natural resources resulting in improvements in local environmental quality and human well-being.

13. More specifically the objectives of the EMF are:

- To outline a framework for environmental screening procedures and methodologies for the “sub projects” to be screened and financed under the program; and
- To specify appropriate roles and responsibilities to carryout environmental screening/assessment, environmental management (mitigation, monitoring and compensation) and reporting related to “subprojects”.

2.0 Palli Karma-Sahayak Foundation

2.1 Governance and Management

16. PKSF was established by the Government of Bangladesh in 1990 as the apex organization with the mandate to alleviate poverty through generating employment. PKSF disburses fund to microfinance institutions (MFIs) who are its Partner Organizations to implement development programs designed for the poor of Bangladesh. At present PKSF has 257 MFIs as its PO providing financial services that have grown in width as well as in breadth. Through PKSF's widespread Partner Organization network, the organization has access to all districts in the country as evident with total disbursement of BDT 454.81 Billion has been disbursed to 8.6 Million borrowers so far. PKSF comprises of two constitutional bodies as per Article of Association: the General Body and the Governing Body.

17. **General Body:** The General Body mainly aims at providing policy guidance to achieve the intended goals of the organization, and this is done through its Annual General Meeting (AGM). Its aim also includes approving the annual budget endorsed by the General Body. The body can have a maximum of 25 members but currently it consists of 16 members. Among 25 members, 15 are chosen from persons associated with the government agencies, voluntary organizations or private individuals having a successful record of service in poverty alleviation and/or interest in such activities. The General Body in the AGM nominates the remaining 10 members, representing Partner Organizations or private individuals.

18. **Governing Body:** The Governing Body of PKSF is responsible for executing the functions of the organization. It provides the required directions and determines the actions to attain its inherent goal. The body consists of 7 sitting members. Among them, the Chairman is nominated by the Government of Bangladesh and he cannot have the government service background. The Managing Director is appointed by the organization in consultation with GOB. Two persons having outstanding track records in alleviating poverty are nominated by the GOB. The rest of the members are directly selected by the General Body in the AGM. They must be non-GOB members and must have demonstrated notable performance in the development sector. Presently, there are 7 members in the Governing Body including the Managing Director.

2.2 Mainstream Programs

19. The mainstream program of PKSF includes six core programs, which represents 83% of the PKSF's total disbursements to POs in FY 2009. Core programs are the driving force behind PKSF's expansion and growth. They include rural microcredit (RMC), urban microcredit (UMC), microenterprise program (ME), ultra poor program (UPP), agriculture sector microcredit (ASM), and seasonal loan (SL). PKSF strives to provide demand driven program that best serve

the needs of the poor. The disbursement of PKSF's core program in FY 2009 was BDT. 15 Billion, whereas POs disbursement stood at BDT. 75.49 Billion to its borrowers.

20. **Rural Microcredit (RMC):** RMC is the first loan program of PKSF since its inception in 1991. RMC program is present in all 257 POs. Main IGAs undertaken by the rural poor include crop and non-crop agriculture, small trade; activities related to transports and are often family-based.

21. **Urban Microcredit (UMC):** The urban poor constitute those living within the boundaries of municipal/metropolitan areas of Bangladesh. UMC borrowers are distinct from the RMC borrowers in that often urban poor are landless, floating (no fixed location for living), and they take loan for mostly trading. The urban poor live in slums and makeshift shacks next to the roads, which make them vulnerable to eviction. Nonetheless, they are also considered to be very resourceful and hardworking.

22. **Microenterprise Program (MEP):** MEP focuses on enhancement of microenterprise and provides loan ranging from BDT 30,000 to BDT 300,000. The program focuses on strengthening non-financial support services such as skill training, market access, which are vital for successful implementation of microenterprise development. In addition, PKSF is working towards strengthening the capacity of its POs by providing necessary services to support micro entrepreneurs in order to respond to a major supply side constraint on ME sector development.

23. **Ultra Poor Program (UPP):** This program brings in the people who cannot meet their basic needs, as they do not have regular and adequate income. The program particularly targets the areas that are inaccessible and having very limited employment opportunities for the ultra poor.

24. **Agriculture Sector Microcredit (ASM):** Small and marginal farmers and their families are eligible to avail this loan. ASM provides loans only to fresh members and has a maximum tenure of 12 month. It has flexibility in terms of repayment and a loan ceiling of BDT 50,000. One of the components of this program is capacity building on sustainable use of modern agricultural technology for the targeted farmers.

25. **Seasonal Loan (SL):** Over the years it became evident through various programs and projects of PKSF that borrowers require short-term loan at specific time of the year. In recognition of seasonal demand PKSF launched the innovative initiative, namely, Seasonal Loan (SL) as a mainstream program in 2008. Only the RMC members can access this loan with or without RMC loan. The prominent features of SL are that the maximum tenure for SL is 9 months, repayment can be done in one installment and the loan can be used for any seasonal IGAs. A borrower can take maximum BDT 50,000 as a seasonal loan.

2.3 Other On-going Projects

26. In addition to six regular operations, PKSP is also implementing other projects. These are: (i) Learning and Innovation Fund to Test New Ideas (LIFT); (ii) Programmed Initiatives for

Monga Eradication (PRIME); (iii) Microfinance and Technical Support (MFTS); (iv) Microfinance for Marginal and Small Farmers (MFMSF) Project; (v) Secondary Participatory Livestock Development Project (PLDP-II); (vi) Disaster Management Fund (DMF); (vii) Livelihood Restoration Program (LRP); and (viii) Emergency 2007 Flood Restoration and Recovery Assistance Program (EFRRAP).

27. PKSF also supports some special programs like (i) Special Assistance for Housing of SIDR-affected Borrowers (SAHOS); (ii) Rehabilitation of SIDR-affected Coastal Fishery, Small Business & Livestock and Enterprises (RESCUE); (iii) Microfinance Support Intervention for Food Security for Vulnerable Group Development (FSVGD) and Ultra Poor (UP) Beneficiaries program; (iv) Rehabilitation of Non-Motorized Pullers and Poor Owners (RNPPPO) project; and (v) Financial Services for the Overseas Employment (FSOEUP).

2.4 How PKSF Works

28. PKSF disburses fund to microfinance institutions (MFIs) who are its Partner Organization (POs) to implement development programs designed for the poor of Bangladesh. PKSF has been very focused on ensuring that strict procedures are followed for enrollment of new POs. It carries out due diligence and field level assessment among other initiatives to ascertain that potential organization become PKSF's PO. Presently, PKSF has 257 MFIs as its PO providing financial services that have grown in width as well as in breadth. Through PKSF's widespread PO network, the organization has access to all districts in the country as evident with total disbursement of BDT. 454.81 Billion to its 8.3 million Borrowers.

2.5 Non Government Organization (NGO)

29. NGOs are "private organizations that pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services, or undertake community development" (The World Bank, Operational Directive 14.70). In wider usage, the term NGO can be applied to any non-profit organization which is independent from government. In CCCP, NGOs refer to operational national organizations in Bangladesh. *NGOs, who will be implementing the subprojects under CCCP, will be termed as Project Implementing Partners (PIPs).*

3.0 Relevant Government Policies, Acts, Rules & Strategies

3.1 General Description of Environmental Polices and Legislation in Bangladesh

30. A wide range of laws and regulations related to environmental issues are in place in Bangladesh. Many of these are cross-sectoral and partially related to environmental issues. The most important of these are the Bangladesh Environment Conservation Act, 1995 (BECA, 1995), and the Environment Conservation Rules (ECR, 1997). The BECA 1995 is primarily an

instrument for establishing the Department of Environment (DoE), and for controlling industrial and project related pollution. The Act also defines in general terms that if any particular activity is causing damage to the ecosystem, the responsible party will have to apply corrective measures. Until the appearance of ECR, 1997, enforcement of the Act was not possible, as many of the clauses refer to specifications detailed in the Rules. BECA and ECR were further amended to address the growing environmental challenges.

31. In addition to the Bangladesh Environmental Conservation Act and Rules, there are a number of other policies, plans and strategies which deal with the water sector, agricultural development, coastal area, protected area disaster management and climate change. These are the National Water Policy, 1999; the Forest Act 1927 (last modified 30th April 2000); National Forest Policy, 1994; the National Conservation Strategy 1992;; National Environmental Management Action Plan (NEMAP), 1995; Coastal Zone Policy, 2005; Coastal Development Strategy, 2006; National Agricultural Policy, 1999; National Fisheries Policy, 1996; National Livestock Development Policy, 2007; Standing Orders on Disaster, 1999 (revised in 2010); Bangladesh Climate Change Strategy and Action Plan, 2009; National Plan for Disaster Management, 2010-2015. Some of these policies and legislations are described in this chapter for reference.

3.2 Bangladesh Environment Conservation Act, 1995

32. The national environmental legislation known as Environmental Conservation Act, 1995 (ECA'95) is currently the main legislative document relating to environmental protection in Bangladesh, which replaced the earlier environment pollution control ordinance of 1992 and has been promulgated in Environmental Conservation Rules, 1997 (ECR'97). This Act is amended in 2000, 2002 and 2010. The main objectives of ECA'95 are: i) conservation of the natural environment and improvement of environmental standards; and ii) control and mitigation of environmental pollution.

33. The main strategies of the act can be summarized as:

- Declaration of ecologically critical areas, and restriction on the operation and process, which can be continued or cannot be initiated in the ecologically critical areas
- Regulation with respect to vehicles emitting smoke harmful to the environment
- Environmental clearances
- Remedial measures for injuries to ecosystems
- Regulation of projects and other development activities
- Promulgation of standards for quality of air, water, noise and soil for different areas for various purposes
- Promulgation of standard limit for discharging and emitting waste
- Formulation and declaration of environmental guidelines

34. Department of Environment (DoE) implements the Act. DoE is under the Ministry of Environment and Forest and is headed by a Director General (DG). The DG has complete control over the DoE. The power of DG, as given in the Act, may be outlined as follows:

- The DG has the power to shut down any activities considered harmful to human life or the environment. The operator has the right to appeal and procedures exist for this purpose. However, if the incident is considered an emergency, there is no opportunity for appeal.
- The DG has the power to declare an area affected by pollution as an ecologically critical area. DoE governs the type of work or activities that can take place in such an area.
- Before beginning new development project, the project proponent must obtain Environmental Clearance from DoE. The procedures to obtain such clearance are in place.
- Failure to comply with any part of ECA'95 may result in punishment by a maximum of 10 years imprisonment or a maximum fine of BDT. 1000,000 or both.

3.3 Environment Conservation Rules, 1997

35. The Environment Conservation Rules provide a first set of rules under the Environment Conservation Act, 1995. This rules is further amended in 2002 and 2003. These provide, amongst others items, standards and guidelines for:

- Categorization of industries and development projects
- Procedure for obtaining environmental clearance
- Environmental quality standards in relation to water pollution, air pollution and noise, as well as permitted discharge/emission levels of water and air pollutants and noise by projects

36. The Rules incorporate "inclusion lists" of projects requiring varying degrees of environmental investigation. The Government is also empowered to specify which activities are permissible and which restricted in the ecologically critical area. Under this mandate, MoEF has declared Sunderban, Cox's Bazar-Tekhnaf Sea Shore, Saint Martin Island, Sonadia Island, Hakaluki Haor, Yanguar Haor, Marzat Baor and Gulshan-Baridhara Lake as ecologically critical areas and accordingly has prohibited certain activities in those areas has also declared four rivers surrounding Dhaka city respectively Buriganga, Balu, Turag and Dhaleshwari as ecologically critical area.

37. Environmental Conservation Rules (1997) classifies industrial units and development projects into four categories for the purpose of issuance of Environmental Clearance Certificate (ECC). These categories are:

- (i) Green (ii) Amber-A (iii) Amber-B, and (iv) Red

The details of the Environmental Clearance Certificate procedure are described in a nutshell is presented in Annex A.

38. **Green Category** projects are considered relatively pollution-free and hence do not require initial environmental examination (IEE) and EIA. An environment clearance certificate (ECC) from the Department of Environment (DoE) is adequate.

39. **Amber Category** projects fall into two categories. Amber-A projects are required to submit general information, a feasibility report, a process flow diagram and schematic diagrams

of waste treatment facilities along with their application for obtaining DoE environmental clearance. Amber-B projects are required to submit an Initial Environmental Examination (IEE) report, along with their application and the information and papers specified for Orange-B projects.

40. **Red** Category projects are those which may cause ‘significant adverse’ environmental impacts and are, therefore, required to submit an EIA report. It should be noted that they may obtain an initial site clearance on the basis of an IEE report, and subsequently submit an EIA report for obtaining environmental clearance along with other necessary papers, such as feasibility study reports and no objections from local authorities.

41. As per ECR '97 all existing industries and projects in Orange-B and Red category require an Environmental Management Plan (EMP) to be prepared and submitted along with other necessary papers while applying for environmental clearance.

3.4 Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009

42. The Government of Bangladesh prepared the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2008 and revised in 2009. This is a comprehensive strategy to address climate change challenges in Bangladesh. It is built around the following six themes:

- **Food security, social protection and health** to ensure that the poorest and most vulnerable in society, including women and children, are protected from climate change. All programs focus on the needs of this group for food security, safe housing, employment and access to basic services, including health.
- **Comprehensive disaster management** to further strengthen the country’s already proven disaster management systems to deal with increasingly frequent and severe natural calamities.
- **Infrastructure** to ensure that existing assets (e.g., coastal and river embankments) are well maintained and fit for purpose and that urgently needed infrastructures (cyclone shelters and urban drainage) is put in place to deal with the likely impacts of climate change.
- **Research and Knowledge management** to predict that the likely scale and timing of climate change impacts on different sectors of economy and socioeconomic groups; to underpin future investment strategies; and to ensure that Bangladesh is networked into the latest global thinking on climate change.
- **Mitigation and low carbon development** to evolve low carbon development options and implement these as the country’s economy grows over the coming decades.
- **Capacity building and Institutional strengthening** to enhance the capacity government ministries, civil society and private sector to meet the challenge of climate change.

44 specific programs are proposed in the BCCSAP under the six themes.

3.5 National Water Policy, 1999

43. The National Water Policy was promulgated in 1999 with the intention of guiding both public and private actions to ensure optimal development and management of water in order to benefit both individuals and the society at large. The policy aims to ensure progress towards fulfilling national goals of economic development, poverty alleviation, food security, public health and safety, a decent standard of living for the people and protection of the natural environment. According to the policy, all agencies and departments entrusted with water resource management responsibilities (regulation, planning, construction, operation and maintenance) will have to enhance environmental amenities and ensure that environmental resources are protected and restored while executing their activities. Environmental needs and objectives will be treated equally with the resources management needs. The policy has several clauses related to the protection and conservation of the natural environment to ensure sustainable development. The strategy of the policy to conserve environment and resource can be summarized as:

- Promoting modern eco-friendly technology and infrastructure for a safe and sustainable future;
- Biodiversity conservation and sustainable land & water management;
- Restricting the conversion of agricultural land for non agricultural purposes.

3.6 National Safe Drinking Water Supply and Sanitation Policy, 1998

44. The National Safe Drinking Water Supply and Sanitation Policy (NSDWSSP, 1998) was adopted in 1998, and sets out the basic framework for the improvement of public health quality and to ensure an improved environment, together with a set of broad sectoral action guidelines. The policy offered the following various objectives to achieve the goal:

- To manage water supply and sanitation related basic needs for all
- To bring about a positive change of peoples' attitude towards water and sanitation
- To reduce the outbreak of water-borne diseases
- To increase the efficiency of the Local Government and associated communities for handling the problems related to water supply and sanitation
- To improve sustainable water supply and sanitation system
- To promote proper conservation, management and use of surface water and to control water pollution in light of the scarcity of groundwater
- To take necessary steps to capture and use rain water

3.7 National Agricultural Policy, 2010

The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food through increasing production of all crops including cereals and ensure a dependable food security system for all. One of the specific objectives of National Agricultural Policy is to take necessary steps to ensure environmental protection as well as 'environment-friendly sustainable agriculture' through increased use of organic manure and strengthening of the integrated pest management program. The policy identifies that the available technologies for agricultural production is not sufficient to cope with the unfavorable environment (climate change, flood, drought, storm, salinity, pest and diseases, river erosion). The policy also suggests to create

awareness so that the chemical fertilizers and pesticides used for increased crop production do not turn out to be responsible for environmental pollution. Water logging and salinity are identified as one of the serious problem in some parts of the country including the coastal areas for agricultural activities and environmental damage. The policy recommends for crop rotation and salt tolerant crop varieties.

3.8 National Fisheries Policy, 1996

45. The National Fisheries Policy, 1996 recognizes that fish production has declined due to environmental imbalances, adverse environmental impact and improper implementation of fish culture and management programs. The policy suggests following actions:

- Shrimp and fish culture will not expanded to the areas which damage mangrove forest in the coastal region
- Biodiversity will be maintained in all natural water bodies and in marine environment
- Chemicals harmful to the environment will not be used fish shrimp farms
- Environment friendly fish shrimp culture technology will be used
- Control measures will be taken against activities that have a negative impact on fisheries, resources and vice-versa
- Laws will be formulated to ban the disposal of any untreated industrial effluents into the water bodies.

3.9 National Livestock Development Policy, 2007

46. The National Livestock Development Policy has been prepared to address the key challenges and opportunity for a comprehensive sustainable development of the Livestock sub-sector through creating an enabling policy framework. The policy recognizes that there are no guidelines for environmental protection and bio-security when establishing poultry farms. The use of antibiotics in feeds is thought to be common and a cause of public health concern. The policy recommends for developing and enforcing specific guidelines for establishing environment-friendly commercial poultry farms.

3.10 Standing Orders on Disaster, 2010

47. The 'Standing Orders on Disaster, 2010' is a substantial improvement over the previous edition (English 1999). New features introduced in this edition include, among others, the following: i) an outline of disaster management regulative framework, ii) an introduction of core groups for emergency response at various levels, iii) multi-agency disaster incident management system, iv) risk reduction roles and responsibilities for all committees and agencies, v) new outlines for local level plans, vi) revised storm warning signals, vii) a report on cyclone shelter design. Conceptually, this edition follows a comprehensive approach emphasizing risk reduction as well as emergency responses relating to all hazards and all sectors.

48. The Standing Order is designed to enhance capacity at all tiers of government administrative and social structures for coping with and recovering from disasters. The document contains guidelines for construction, management, maintenance and use of cyclone shelters. According to the guideline, geographical information system (GIS) technology will be applied at

the planning stage to select the location of cyclone shelter considering habitation, communication facilities, distance from the nearest cyclone-center etc. The advice of the concerned District Committee is to be obtained before final decision. The cyclone shelters should have effective communication facilities so that in times of distress there are no unnecessary delays. For this reason, the road communication from the cyclone shelters should link to cities, main roads and neighboring village areas. Provision of emergency water, food, sanitation and shelter space for livestock during such periods should also be considered for future construction of shelters.

49. The Standing Orders on Disaster (SOD) specifically focuses on community vulnerability and capacity development of the community to adapt disaster (cyclone, tidal surge, tsunami, earthquake, tornado, flood, water logging, salinity, high tide, cold wave) resistant features like disaster resistant agriculture and other livelihood options. The SOD also delineates the activity of different administration at pre, during and post disaster period.

3.11 Coastal Zone Policy, 2005

50. Coastal zone policy provides general guidance so that the coastal people can pursue their livelihoods under secured conditions in a sustainable manner without impairing the integrity of the natural environment. The policy framework underscores sustainable management of natural resources like inland fisheries & shrimp, marine fisheries, mangrove and other forests, land, livestock, salt, minerals, sources of renewable energy like tide, wind and solar energy. It also emphasis on conservation and enhancement of critical ecosystem-necessary measures will be taken to conserve and develop aquatic and terrestrial including all the ecosystems of importance identified by the *Bangladesh National Conservation Strategy* (Mangrove, coral reef, tidal wetland, sea grass bed, barrier island, estuary, closed water body, etc).

3.12 Coastal Development Strategy, 2006

51. Coastal Development Strategy has been approved by the Inter-Ministerial Steering Committee on ICZMP on February 13, 2006. The strategy is based on the Coastal Zone Policy and takes into account the emerging trends: increasing urbanization, changing pattern of land use, declining land and water resources, unemployment and visible climate change impacts. The strategy has 9 strategic priorities and the following 3 are relevant priorities with proposed type of interventions:

Safety from man-made and natural hazards - i) Strengthening and rehabilitation of sea dykes; and ii) reduction of severe vulnerability in the coastal zone through multi-purpose cyclone shelters, including coping mechanism.

Sustainable management of natural resources - i) environmentally and socially responsive shrimp farming; ii) introduction of renewable energy in coastal areas; and iii) development of marine fisheries and livelihood.

Environmental conservation – i) Marine and coastal environmental development; ii) strengthening of Coast Guard for improvement of coastal safety and security in coordination with other law enforcing agencies.

3.13 Implication of Government Polices, Acts and Rules on CCCP Activities

52. The regulatory requirement for environmental management is described in the Bangladesh Environmental Conservation Act'95 and Environmental Conservation Rules'97. The ECR'97 (with amendments later on) is mainly intended for different industries and large scale projects. ECR'97 defined different sectors (industries and projects) as 'Green', 'Amber-A', 'Amber-B' and 'Red' categories, without considering the extent and types of interventions. For example, construction/reconstruction/expansion of flood control embankment, polders, dykes etc. are classified as the 'Red' category project. However, it does not explicitly mention about the environmental category for community based small scale rehabilitation of those structures. Considering the NGO implemented community level small scale subprojects, the CCCP requires a flexible approach on environmental categorization and clearance. However, as per ECR, the PIP (implementing NGOs) will screen all the sub-grant proposal and further carry out IEE (if required) and take appropriate mitigation measures. It should be mentioned that Sub Grant Proposal (SGP) with significant environmental impact will not be funded through CCCP.

4.0 World Bank Safeguard Policies

4.1 World Bank's environmental guidelines

53. The Bank requires environmental assessment (EA) and Social Assessment of projects proposed for Bank financing to help ensure that they are both socially and environmentally sound and sustainable, and thus to improve decision making. The World Bank's environmental assessment policy and recommended processing are described in Operational Policy (OP)/Bank Procedure (BP) 4.01: Environmental Assessment. This policy is considered to be the umbrella policy for the Bank's environmental "safeguard policies" which among others include: Natural Habitats (OP 4.04), Forests (OP 4.36), Pest Management (OP 4.09), Physical Cultural Resources (OP 4.11)), and Safety of Dams (OP 4.37). Operational Policies (OP) is the statement of policy objectives and operational principles including the roles and obligations of the Borrower and the Bank, where as Bank Procedures (BP) is the mandatory procedures to be followed by the Borrower and the Bank.

4.1.1 OP/BP 4.01 Environmental Assessment

54. The most relevant policy of WB in CCCP supported activities is OP 4.01 Environmental Assessment. The Bank requires environmental assessment (EA) of projects proposed for Bank support to ensure that they are environmentally sound and sustainable, and thus to improve decision making. EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The borrower is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements.

55. The Bank classifies the proposed project into three major categories as shown in the following Table 1, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. Projects with multiple components or with multiple subprojects (other than projects using FIs) are categorized according to the component with the most serious potential adverse effects. Dual categories may not be used. However, the depth and breadth of EA and choice of EA instrument(s) for each component or each subproject is decided on the basis of its respective potential impacts and risks.

Table 1: World Bank Environmental Screening

Category	Category 'A'	Category 'B'	Category 'C'
Description	The project is likely to have significant adverse environmental	The project has potential adverse environmental impacts on human populations or environmentally important areas—including	The project is likely to have minimal or no adverse

Category	Category ‘A’	Category ‘B’	Category ‘C’
	impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works	wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category ‘A’ projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category ‘A’ projects.	environmental impacts
EA Requirements	For a Category ‘A’ project, the project sponsor is responsible for preparing a report, normally an EIA	EA is narrower than that of Category ‘A’ EA. Like Category ‘A’ EA, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.	Beyond screening, no further EA action is required for a Category ‘C’ project

4.1.2 OP/BP 4.04 Natural Habitats

56. The conservation of natural habitats, like other measures that protect and enhance the environment, is essential for long-term sustainable development. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development by ensuring protection, maintenance, and rehabilitation of natural habitats and their functions in its economic and sector work, project financing, and policy dialogue. The Bank does not support projects that involve the significant conversion or degradation of critical natural habitats.

4.1.3 OP/BP 4.09 Pest Management

57. To manage pests that affect either agriculture or public health, the Bank supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides. In Bank-financed projects, the borrower addresses pest management issues in the context of the project's environmental assessment. In appraising a project that will involve pest management, the Bank assesses the capacity of the country's regulatory framework and institutions to promote and support safe, effective, and environmentally sound pest management. As necessary, the Bank and the borrower incorporate in the project components to strengthen such capacity. The Bank uses various means to assess pest management in the country and support integrated pest management and the safe use of agricultural pesticides: economic and sector work, sectoral or project-specific environmental assessments, participatory IPM assessments, and investment projects and components aimed specifically at supporting the adoption and use of IPM.

58. In Bank-financed agriculture operations, pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties that are resistant or tolerant to the pest. The procurement of any pesticide in a Bank-financed project is contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and the intended user. With respect to the classification of pesticides and their specific formulations, the Bank refers to the World Health Organization's Recommended Classification of Pesticides by Hazard and Guidelines to Classification (Geneva: WHO 1994-95).

4.1.4 OP/BP 4.11 Physical Cultural Resources

59. Physical cultural resources are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Their cultural interest may be at the local, provincial or national level, or within the international community. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements. The borrower addresses impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment (EA) process. The following projects are classified during the environmental screening process as Category A or B, and are subject to the provisions of this policy: (a) any project involving significant excavations, demolition, movement of earth, flooding, or other environmental changes; and (b) any project located in, or in the vicinity of, a physical cultural resources site recognized by the borrower. When the project is likely to have adverse impacts on physical cultural resources, the borrower identifies appropriate measures for avoiding or mitigating these impacts as part of the EA process. These measures may range from full site protection to selective mitigation, including salvage and documentation, in cases where a portion or all of the physical cultural resources may be lost.

4.1.5 OP/BP 4.36 Forests

60. Forest is defined as an area of land of not less than 1.0 hectare with tree crown cover (or equivalent stocking level) of more than 10 percent that have trees with the potential to reach a minimum height of 2 meters at maturity *in situ*. A forest may consist of either closed forest formations, where trees of various stories and undergrowth cover a high proportion of the ground, or open forest. Young natural stands and all plantations that have yet to reach a crown density of 10 per cent or tree height of 2 meters are included under forest, as are areas normally forming part of the forest area that are temporarily unstocked as a result of human intervention such as harvesting or natural causes but that are expected to revert to forest. The definition *includes* forests dedicated to forest production, protection, multiple uses, or conservation, whether formally recognized or not. The definition *excludes* areas where other land uses not dependent on tree cover predominate, such as agriculture, grazing or settlements. In countries

with low forest cover, the definition may be expanded to include areas covered by trees that fall below the 10 percent threshold for canopy density, but are considered forest under local conditions. The Bank's forests policy aims to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development. Where forest restoration and plantation development are necessary to meet these objectives, the Bank assists borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem functionality. The Bank also assists borrowers with the establishment and sustainable management of environmentally appropriate, socially beneficial, and economically viable forest plantations to help meet growing demands for forest goods and services.

4.1.6 OP/BP 4.37 Safety of Dams

61. When the World Bank finances for new dams, the Policy Safety on Dams requires that experienced and competent professionals design and supervise construction, and that the borrower adopts and implements dam safety measures through the project cycle. The policy also applies to existing dams where they influence the performance of a project. In this case, a dam safety assessment should be carried out and necessary additional dam safety measures implemented.

4.2 Implication of World Bank Policies on CCCP Activities

62. The Bank requires environmental screening and classification for all investment projects (including ones financed by Trust Funds, Project Preparation Facilities and Guarantees) proposed for Bank financing, to help ensure that they are environmentally and socially sound and sustainable. Given that the sub-project is yet to be identified, each sub-project will be treated separately and given its own environmental screening as per World Bank guideline. The Bank recognizes that environmental screening and classification is not absolute and involves professional judgment on a case by case basis. The NGOs may not have the in house capacity to imply the professional judgment for identifying environmental impact. When screening by NGOs and reviewing the screening result by PKSf, careful consideration needs to be given to potential environmental impacts and risks associated with the proposed sub grant project. Judgment is exercised with reference to the policy expectations and guidance; real impacts on the ground; and established regional and Bank-wide precedence and good practice. Since the OP/BP 4.01 covers all important aspects of the environment and the scale of interventions is small, it is justified to trigger only OP/BP 4.01 Environmental Assessment.

5.0 Climate Vulnerability and Environmental Setting

5.1 Issues due to Climatic Vulnerability

65. Bangladesh is widely recognized to be one of the most climate vulnerable countries in the world. The country is susceptible to monsoon floods, tropical cyclones, storm surges, and droughts. The regions of Bangladesh affected by these different hazards are shown in Figure 5.1. The CCCP project will address the climate change impacts through a strategic approach, targeting three different environmental issues. The issues are (1) Flood (2) Drought (3) Salinity Intrusion.

5.1.1 Flood

66 The most common water-related natural hazard in Bangladesh is flood. Floods in Bangladesh can be classified into four categories based on their origin: (i) flash floods, (ii) river floods, (iii) rainwater floods, and (iv) coastal floods. Most of the Bangladesh lies in the delta of three of the largest rivers in the world – the Brahmaputra, the Ganges and the Meghna. The combined peak discharge of these three rivers in the flood season is 180,000 m³/sec (the second highest in the world, after the Amazon). Bangladesh possesses only about 7 percent of the catchment area of the Granges-Brahmaputra-Meghna (GBM) basins, while over 92 % of the water volume is discharged through it. Such an imbalance in the draining of the regional surface water causes abundance of water in the monsoon months. Furthermore, a decline in drainage gradient along the Ganges and other rivers results in severe drainage congestion close to the estuary. As a result, an estimated average of around 25% of the landmass of the country is flooded every year, while about 60% landmass is prone to flooding. Recent analysis suggests that the frequency of devastating floods in Bangladesh is on increase¹. Four of the most severe floods have occurred in the past 30 years, whereas only two floods with comparable intensity visited Bangladesh during the preceding 70 years. Another study showed that the recurrence interval for the devastating flood will reduce from roughly 1 in 50 years to 1 in 30 years in the 2020s and 1 in 15 years in the 2050s due to climate change². About 21 percent of the country is subject to annual flooding and an additional 42 percent is at risk of floods with varied intensity³.

5.1.2 Drought

67. Increasing frequency and intensity of droughts in many parts of the Bangladesh are attributed largely to a rise in temperature, particularly during the summer and normally drier months. Droughts most commonly affect the northwestern region, which generally has lower

¹ Ahmed, Q.K. (ed), 2000. Bangladesh Water Vision 2025: Towards Sustainable Water World. Bangladesh Water Partnership (BWP), Dhaka.

² Tanner TM, Hassan A, Islam KMN, Conway, D, Mechler R, Ahmed AU, and Alam, M, 2007: Piloting Climate Risk Screening in DFID Bangladesh. Summary Research Report. Institute of Development Studies, University of Sussex, UK

³ Ahmed, A.U. and M.M.Q. Mirza, 2000: Review of causes and Dimensions of Floods with particular Reference to Flood'98: National Perspectives. In Q. K. Ahmed *et.al.* eds. *Perspectives on Flood 1998*. Dhaka University press Limited.

rainfall than the rest of the country. IPCC is projecting that more frequent and prolonged droughts as a consequence of climate change and other anthropogenic factors together will result in the increasing trends of desertification in the South Asia⁴. The World Bank⁵ projected that Bangladesh will be mostly affected by severe drought due to climate change.

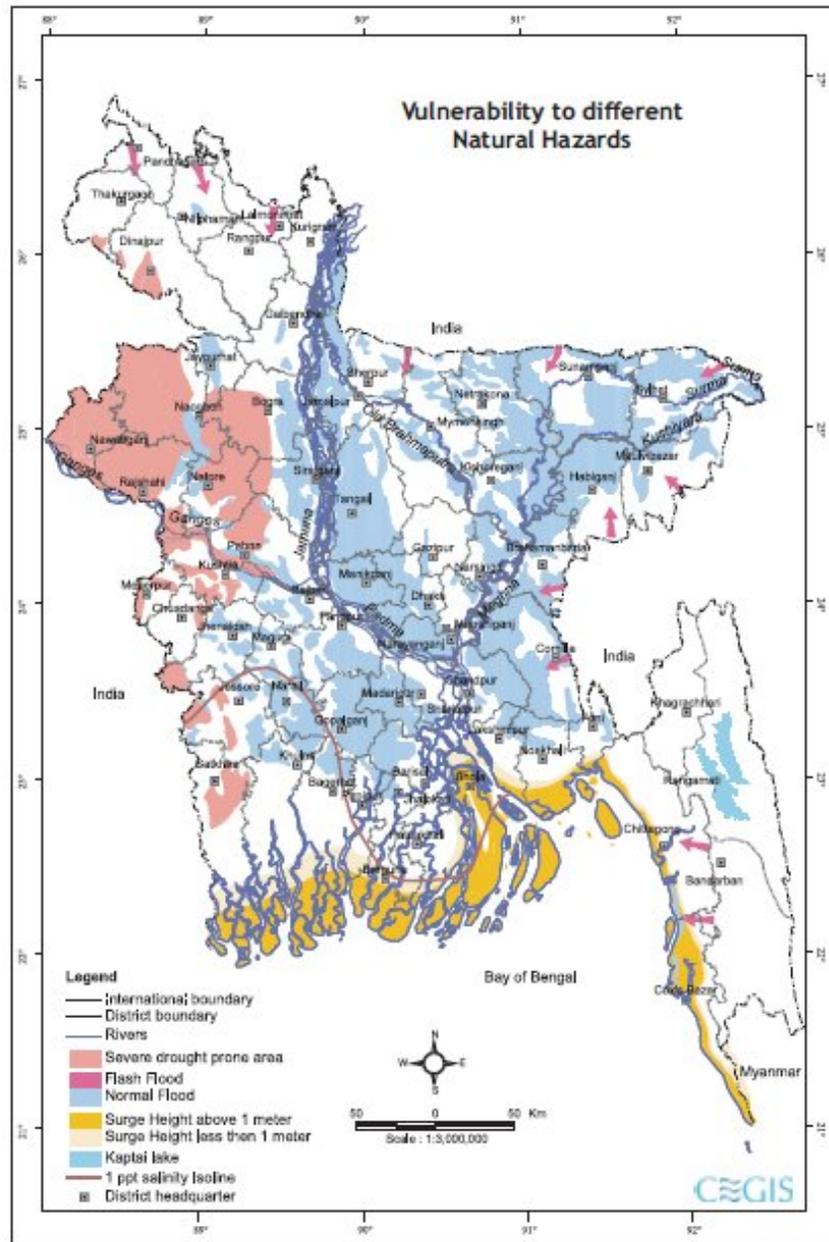


Figure 5.1: Areas Affected by Different Types of Climate Related Disasters
(Source: BCCSAP, 2009 referring CEGIS)

⁴ Cruz, R.V., H. Harasawa, M. Lal, S. Wu, Y. Anokhin, B. Punsalmaa, Y. Honda, M. Jafari, C. Li and N. Huu Ninh, 2007: Asia. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 469-506.

⁵ World Bank, 2009. South Asian Region- Towards a Climate Change Strategy, World Bank, Washington, D.C.

5.1.3 Salinity Intrusion

68. Bangladesh is susceptible to increasing salinity of their groundwater as well as surface water resources, especially along the coast, due to increases in sea level as a direct impact of global warming. Over-exploitation of groundwater has resulted in a drop in its level, leading to ingress of sea water in coastal areas making the sub-surface water saline. Increasing frequency and intensity of droughts in the catchment area will lead to more serious and frequent salt-water intrusion in the estuary and thus deteriorate surface and groundwater quality. Although the effect of saline water intrusion is mostly seasonal, but every cm of probable sea level rise will result significant rise of the interface because of the hydrostatic pressure balance. This salinity intrusion problem will aggravate the fresh water availability for irrigation and land suitability for rice production, increased burden on groundwater exploitation and subsequent risk of Arsenic related disease outbreak.

5.2 Environmental Setting of the Climate Vulnerable Areas

69. The subprojects to be funded under CCCP will be identified and approved during implementation phase of CCCP. Consequently, specific information on types of subprojects, site/location of the sub-projects, land requirements, local communities, geo-physical land features and nature is not available. Therefore, exact detail and baseline information cannot be determined during project preparation. The sub projects will be community based demand driven to strengthen the resilience due to climatic vulnerability. The implementing NGOs are required to collect the baseline information during the proposal submission stage. In this context, the agro-ecological zones defined by the Land Resources Appraisal of Bangladesh under the FAO/UNDP Agricultural Development Adviser Project (BGD/81/035) is presented to understand the land use pattern of the country.

70. Land use pattern of the country showing Map B.1 of Annex B is influenced by agro ecology, soil physiography and climatic factors. According to the variations of all these factors and agricultural potential, the total land area has been into 30 agro-ecological zones. The agro-ecological map in Annex A was built up by adding successive layers of information about the environment which are relevant for land use and for the assessment of agricultural potential. These layers are:

- physiography (which provides information on landforms and soil parent materials);
- soils
- depth and duration of seasonal flooding;
- length of rainfed kharif and rabi growing periods;
- length of the pre-kharif period of unreliable rainfall
- length of the cool winter period; and
- frequency of occurrence of extremely high (>40°C) summer temperature

71. Physiography is the primary element in defining and delineating the agroecological regions in Bangladesh. Soils is the second element in defining and differentiating agroecological zones as soil conditions determine important properties for plant growth, moisture supply, root aeration and nutrient supply. The third factor is land level in relation to flooding. In this regard

the country has been classified into five types of land level such as (i) highland (land which is above normal flood-level), (ii) medium highland (land which normally is flooded up to about 90 cm deep during the flood season), (iii) medium lowland (land which normally is flooded up to between 90 cm and 180 cm deep during the flood season), (iv) lowland (land which normally is flooded up to between 180 cm and 300 cm deep during the flood season) and (v) very lowland (land which normally is flooded deeper than 300 cm during the flood season).

72. During the project preparation, the few districts have been short listed in salinity, flooding and drought prone areas based on the population, poverty and climatic vulnerability. The districts are shown in Figure B.2 of Annex B. The districts are preliminary short-listed but not yet finalized. In coastal region, target geographic area will cover 6 coastal districts (out of the 19 coastal districts): Sathkhira, Khulna, Jessore Bagerhat, Pakuakhali and Barguna. In the flood affected area, the project will target Barishal, Cox's Bazar, Jamalpur, Mymensingh, Bagerhat, Jessore, Khulna, Kurigram, Nilphamari, Chuadanga, Jessore, Sathkhira, Naogaon, Natore, Nawabganj and Rajshahi are targeted as the drought prone area. However, the exact locations and the districts may change during project implementation.

5.2.1 Flood Affected Area

- a. Barisal, Bagerhat, Jessore and Khulna are located widely affected by flood. **Barisal** district has the characteristics of Active Ganges Flood Plain,(Agroecological zone 10), Low High Ganges River Floodplain (Agroecological zone 12), Low Ganges River Floodplain (Agroecological zone 13), Young Meghna Estuarine Floodplain (Agroecological zone 18) and Old Meghna Estuarine Floodplain(Agroecological zone 19). Barisal District with an area of 2790.51 km² is bounded by Madaripur, Shariatpur, Chandpur and Lakshmipur districts on the north, Patuakhali, Barguna and Jhalokati districts on the south, Bhola and Lakshmipur districts on the east, Jhalokati, Pirojpur and Gopalganj districts on the west.

Bagerhat district has a total area of 3959.11 square kilometres. It is bounded by Gopalganj District and Narail District on the north, The Bay of Bengal on the south, Gopalganj District, Pirojpur District and Barguna District on the east and Khulna District on the west. Main rivers of the district are Panguchi, Daratana, Madhumati River, Pasur River, Haringhata, Mongla River, Baleswar, Bangra and Goshairkhali. Bagerhat falls under Low High Ganges River Floodplain (Agro Ecological Zone 12) and Low Ganges River Floodplain (Agro Ecological Zone 13). The annual average temperature of Barishal, Bagerhat area has a maximum of 26.4°C and a minimum 25°C, with annual rainfall of ranges from 1600 to 2500 mm.

Jessore District encompasses 2578.20 km². It is bounded by Jhenaidaha and Magura districts on the north, Sathkhira and Khulna districts on the south, Narail and Khulna districts on the east, and West Bengal of India on the west. Major rivers that flow through this region are the Bhairab and Kapotakhho. Annual average temperature range from 9 to 41 °C (48 to 106 °F). The annual rainfall is 1,537 millimetres (60.5 in). Jessore is located in High Ganges River Floodplain (Agro ecological zone 11) and Gopalganj Khulna Bils (Agroecological zone 14).

Khulna is located in south-western Bangladesh with a total area of 59.57 km². It lies south of Jessore and Narail, East of Sathkhira, West of Bagerhat and North of the Bay of Bengal. It is

part of the largest delta in the world. In the southern part of the delta lies the Sundarban, the world's largest mangrove forest. The city of Khulna is in the northern part of the district, and is mainly an expansion of trade centers close to the Rupsha and Bhairab rivers. Kapotakkh river is important in Khulna. The annual average temperature for Khulna is 35.5 °C with a record low of 10 °C. The average rainfall of Khulna is 1600 mm. Khulna falls under High Ganges River Floodplain (Agro ecological zone 11), Low High Ganges River Floodplain (Agro Ecological Zone 12) and Low Ganges River Floodplain (Agro Ecological Zone 13)

The major challenges in these four districts are: a) Poor communication, both by water and by road, b) Dry season soil salinity, c) Lack of fresh surface water or groundwater for dry season irrigation in most areas, d) Constant bank erosion and new char formation e) salinity. The description of overlapping agroecological zone for Barishal, Bagerhat, Jessore and Khulna is presented in table 5.2.

Table 5.1: Description of the Barishal, Bagerhat, Jessore and Khulna Covered Agro-ecological Zones

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
Active Ganges Floodplain (10)	Char area have an irregular relief of broad and narrow ridges and depressions which is interrupted by cut off channel and active channels. Local differences in elevation are about 2.5m.	High land (12%), Medium high land (33%), Medium low land (18%), Low land (4%), Homestead and water bodies (33%). The soils are in a complex mixture of calcareous sandy, silty and clay alluvium proportion. Organic matter contents are low to medium (1-3.4%). The soil is moderately alkaline	There is ample surface water in active and cut off channels but it is difficult to use for irrigation because of constantly change in channels, relief and soils. Ground water is available by hand tubewell and shallow tube well.	The major cropping patterns are: Black gram/wheat/onion /garlic/B. aus/jute-Fallow Black gram/wheat/onion /garlic/B. aus/jute-T. aman Boro-Fallow-T. aman Sugarcane
High Ganges River Floodplain (11)	Most area has a complex relief of broad and narrow ridges and inter-ridge depressions. Upper parts of high ridges remain above flood level. Lower parts are seasonally flooded (shallow).	High land (43%) Medium high land (32%) Medium low land (12%) Low land (2%) Homestead and water bodies (11%) Soils are silt loam and silty clay loam in ridges and dark grey clay soils in basins. Most ridge soils are calcareous and basin soils are non-calcareous. Organic matter content in ridges are low (<1.5%) and	Water is pumped from the Ganges river channel to irrigate kharif crops to the southern part of the region. Elsewhere, only limited amount of surface water are available from small river and ox-bow lake to irrigate dry land rabi crops and in bill to irrigate boro	The major cropping patterns are: Wheat-B. aus/jute-Fallow Wheat - B. aus/Jute-T. aman Mustard-Jute-

		high (2-5%) in dark grey soil. Soil reaction is neutral in strongly acidic.	paddy.	T.aman Lentil-Sesame-T.aman Sugarcane-Boro-DW T.aman
Low High Ganges River Floodplain (12)	The region has a typical meander floodplain landscape of flood ridges and basins. Differences in elevation between ridge top and basin centers are generally in the range of 3-5m.	High land (13%) Medium high land (29%) Medium low land (31%) Low land (14%) Very low land (2%) Homestead and water bodies (11%) Soils are olive brown silty loam and silty clay loam on the highest part of floodplain ridges and dark grey silty clay loam to heavy clay on lower sites. Organic matter content is medium (1.7-3.4%). Basin clay soils are strong to very strongly acidic cultivated layer with neutral subsoil.	Limited amount of surface water are available in bils for dry season irrigation. Ground water supply within 100m from the surface varies from place to place.	The major cropping patterns are Wheat/Mustard-B.aus/Jute-Fallow-Sugarcane Wheat-B.aus/Jute-T.aman Boro-DW T.aman Chickpea - Mixed broadcast Aus and Aman.
Low Ganges River Floodplain (13)	The greater part of this region has smooth relief. River banks generally stand about a meter or less above the level of adjoining basins. The region is characterized by a close network of interconnected tidal rivers and creeks.	High land (2%), Medium high land (78%), Medium low land (2%), Low land (<1%), Homestead and water bodies (16%). The general pattern of the soil is grey, slightly calcareous loamy soils on river banks and grey or dark grey, noncalcareous, heavy silty clays in the basin. Organic matter content is medium (1.7-3.4%). Extremely acid soil (acid sulfate soils) occur patchily in basin.	This region is well provided with surface water resources. Most places are less than 500 meters from a tidal river or crack. Ground water is saline in near surface aquifers throughout most of this region. Sweet water occurs in aquifers at around 300 meters.	The major cropping patterns are Boro -Fallow-Fallow Fallow-Shrimp - T.aman Fallow- T.aus-T.aman Natural mangrove forest
GOPALGA NJ KHULNA BILS (14)	Most of the region is level and low laying, with two ridges along rivers and creeks.	High land (3%), Medium high land (13%), Medium low land (41%), Low land (28%), Very Low Land (11) Homestead and water bodies (4%).	Surface water is plentifully available for irrigation use. Rivers and creeks are tidal in the dry season. Ground water is sweet in northern and eastern areas but	The major cropping patterns are Grass pea-broadcast aus - Fallow Grasspea - jute - Fallow

		On basin margins grey and dark grey acidic heavy clay overlies peat and muck at 25-100cm. Soft peat and muck occupy perennially wet basin centers. Organic matter content is medium (1.7-3.4%).	saline in the south-west.	Boro-Fallow-Fallow
Young Meghna Estuarine Floodplain (18)	The area is almost level with very low ridges and broad depressions. Land is constantly eroding due to channel shifting.	High land (<1%), Medium high land (45%), Medium low land (7%), Homestead and water bodies (47%). Soils color is grey to olive. The soil is a mixture of silt loams and silty clay loams and contains medium organic matter.	Sweet water is available in a small quantity at a shallow depth in floodplain ridges. Salinity gradually increases northward in the dry season.	The major cropping patterns are Fallow-B.aus-T.aman Fallow-Sesame-T.aman Fallow-T.aus-T.aman Coconut, Betel nut, Sugarcane
Old Meghna Estuarine Floodplain (19)	Mainly smooth, broad basins with narrow rims of highland along rivers. The differences in elevation between river banks and adjoining basin centres are 3-6m or more.	High land (2%) Medium high land (24%) Medium low land (33%) Low land (21%) Very low land (3%) Homestead and water bodies (17%) Silty soils predominate but silty clay and clay also found. Organic matter contents in the cultivated layer range from 1-2.5 percent in ridges and 2-5% in depression. Moisture holding capacity is high.	Surface water used for irrigation is widely available from the Meghna, Sitalakhya, Dhaleswari or Ganges distributaries. Ground water apparently is readily available for use by tubewell.	The major cropping patterns are Mustard/wheat/grass/pea/potato/cucurbits-B.aus-T.aman Boro-Fallow-T.aman Sugarcane B.aus-Fallow Mustard-Jute-Fallow

- b. Cox's Bazar town with an area of 6.85 km², is located at 21°35'0"N 92°01'0"E 21.583333°N 92.016667°E and bounded by Bakkhali River on the north and East, Bay of Bengal in the West, and Jhilwanj Union in the south. The climate of Cox's bazar is mostly similar to the rest of the country. It is further characterised by the location in the coastal area. The annual average temperature in Cox's Bazar remains at about a maximum of 34.8 °C and a minimum of 16.1 °C. The average amount of rainfall remains at 4,285 mm. The typical climatic challenges of Cox's Bazar are a) Heavy monsoon rainfall, severe flash floods and exposure to cyclones and b) soil salinity. Cox's Bazar is confined into Chittagong Coastal Plain

(Agroecological zone 23). The description of the Cox’s Bazar covered Agro-ecologica zone is presented below:

Table 5.2: Description of the Cox’s Bazar Covered Ago-ecological Zones

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
Chittagong Coastal Plain (23)	The region includes 6 physiographic unit namely piedmont plains, river floodplain, old tidal floodplain Young tidal floodplain. Mangrove tidal floodplain and old beach ridges.	High land (17%) Medium high land (43%) Medium low land (13%) Low land (<1%) Homestead and water bodies (27%) Soils conditions are relatively uniform over most of the area, with grey color and low organic content. Silt loams and silty clay loams are predominating. The soil is acidic	Limited amount of water is available in the rivers and streams in the dry season which is already fully exploited for irrigation. Ground water resources are scattered.	The major cropping patterns are: Fallow-T. aus-T. aman Fallow-B. aus-T. aman Boro-Fallow-T. aman

c. Kurigram and Nilphamary both districts fall under Active Teesta Flood Plan (Agroecological zone 2). Additionally, kurigram and Nilphamary fall in Active Brahmaputra - Jamuna Floodplain (Agroecological zone 7) and Low Ganges River Floodplain (Agro ecological zone 13) respectively. Kurigram District is located in the northern region of Bangladesh along the border of India. The area of this district is 2,296.10 km². This district is surrounded by Cooch Behar district of India in the north, Gaibandha district of Bangladesh in the south, Assam state of India in the east and, Lalmonirhat and Rangpur districts of Bangladesh in the west. Weather of the Kurigram district is bit different from the middle or southern part of Bangladesh. The average maximum temperature is about 32-33 degree Celsius when average minimum temperature is about 10-11 degrees. Heavy rainfall is usually observed during the rainy season like other parts of Bangladesh and the average annual rainfall is about 3000 mm. Several rivers are flowing through this district. The major rivers are Brahmaputra, Dharla, and Tista.

Nilphamary with an area of 1640.91 km², is bounded by Kuchbihar district of West Bengal (India) on the north, Rangpur district on the south, Lalmonirhat district on the east and Panchagarh and Dinajpur districts on the west. Annual temperature: maximum 32.3°C, minimum 11.2°C; annual rainfall 2931mm. Main rivers are Teesta, Jamuneshwari, Chikli and Dhaigan. The key features of Kurigram and Nilphamary bounded zone are presented below:

Table 5.3: Description of the Kurigram and Nilphamary Covered Ago-ecological Zones

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
Active Tista Floodplain (2)	This region has complex pattern of low, generally smooth, ridges, inter-ridges depressions, river Channels, cut-off channels.	High land (2%) Medium high land (72%) Homestead and water bodies (26%) Soils are predominating with irregular pattern of grey, stratified, sands and silts. The proportions of sandy and silty alluvium on char land vary from year to year. The soil is not fertile.	There are ample surface water and ground water resources for irrigation. However, the surface water resources are difficult to exploit because of the shifting river channels. Dug wells and hand tube well could be used for rabi crops, where irrigation is needed.	The major cropping patterns are Sweet potato-Aus/Jute-Fallow Tobacco-Aus/Jute-Fallow Wheat-Aus/Jute-T.Aman Sweet potato-Fallow-Fallow Sugarcane-Sugarcane-Sugarcane
Active Brahmaputra - Jamuna Floodplain (7)	The region has an irregular relief of broad and narrow ridges and depressions, interrupted by cut off channels and active channels. Local differences in elevation are mainly 2-5 meters.	High land (5%) Medium high land (37%) Medium low land (20%) Low land (8%) Homestead and water bodies (30%) Soils are mixture of sandy and silty alluvium which occupy most char land. Overall silty deposits are more extensive than sandy deposits. Organic matter content is low (< to 1.7%). The soil is chemically neutral to moderately alkaline.	There is ample surface water and ground water resources, but they are difficult to exploit for irrigation except by small scale traditional devices or hand pumps because of shifting river channels and changing land qualities.	The major cropping patterns are Mustard - Aus/Jute-Fallow Mustard - Mixed broadcast Aus and Aman Blackgram - millets/Aus/Jute-Fallow
Low Ganges River Floodplain (13)	The greater part of this region has smooth relief. River banks generally stand about a meter or less above the level of adjoining basins. The region is characterized by a close network of interconnected tidal rivers and creeks.	High land (2%), Medium high land (78%), Medium low land (2%), Low land (<1%), Homestead and water bodies (16%). The general pattern of the soil is grey, slightly calcareous loamy soils on river banks and grey or dark grey, noncalcareous, heavy silty clays in the basin. Organic matter content is medium (1.7-3.4%). Extremely acid soil (acid sulfate soils) occur patchily in basin.	This region is well provided with surface water resources. Most places are less than 500 meters from a tidal river or crack. Ground water is saline in near surface aquifers throughout most of this region. Sweet water occurs in aquifers at around 300 meters.	The major cropping patterns are Boro -Fallow-Fallow Fallow-Shrimp - T.aman Fallow- T.aus-T.aman Natural mangrove forest

d. **Mymensingh** is bordered on the north by Meghalaya state of India and Garo Hills, on the south by Gazipur district, on the east by districts of Netrokona and Kishorganj and on the west by districts of Sherpur, Jamalpur and Tangail. The district covers an area of around 4,363 square kilometers, with several small valleys between high forests. The temperature ranges from 33 degrees to 12 degrees Celsius, and the annual rainfall averages 2,174 mm. The city of Mymensingh stands on the bank of Old Brahmaputra River, as the 1897 great Assam Bengal earthquake changed the main flow from Brahmaputra to the Jamuna river which co-sided west of the greater Mymensingh region. The area of Greater Mymensingh, the north front line is just at the foot of Garo hills of Meghalaya of India, the east ends in the wetland (Haor), the west ends in the single wood forest(e.g. Muktagacha, Fulbaria and Valuka Upozillas) and the Chars of Jamalpur district sided north-west of Mymensingh district. There is geographical varieties comprises single wood forests, Chars and river valleys and also touching the Himalaya at Garo hills. Mymensing district covers the Young Brahmaputra and Jamuna Floodplain (Agro Ecological Zone 8), Madhupur Tract (Agro Ecological Zone 28) and Northern and Eastern Hills (Agro Ecological Zone 29). The main climatic challenges in Mymensingh are (i) uncertain time of onset and recession of the rainy season and seasonal flooding, (ii) occasional heavy rainfall during monsoon, (iii) occasional high flood and late floods damaging aus, jute, deepwater or T.aman, (iv) flash flood in valleys (v) Erosion of slopping soils on upland edges. The description of overlapping agroecological zone for Mymensingh is presented in table 5.4.

Table 5.4: Description of the Mymensingh Covered Ago-ecological Zones

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
Young Brahmaputra and Jamuna Floodplain (8)	This region has a complex relief of broad and narrow ridges, inter-ridge depressions, partially in filled cut off channel and basins.	High land (18%) Medium high land (42%) Medium low land (19%) Low land (9%) Homestead and water bodies (12%) The soils range from shallow, permeable, sandy loams on ridge and impervious heavy clay in some basin centre. Organic matter varies from 1-5%.	Usable surface water supplies are virtually fully exploited by low-lift pumps. Ground water is usually available by tubewell irrigation.	The major cropping patterns are Boro-Fallow-T.aman Wheat/mustard/potato –B.aus/Jute –T. aman Fallow-T.aus-T.aman Boro-Fallow-Fallow
Madhupur Tract (28)	There are six type of physiography in six sub region which are-Level upland area with well drained red brown soil, ii) Closely dissected upland areas with deep well drained red soils on level upland soils and deep broad valleys with grey and dark grey heavy clay, iii) Closely dissected areas with shallow, moderately to poorly drained brown soils, land areas with	High land (56%) Medium high land (18%) Medium low land (7%) Low land (7%) Homestead and water bodies (10%) Soils are clayey (87%), loamy (13%) and sandy (<1%) organic matter content is low (<1.5%) and pH ranging from 4.5 to 7.8.	Only limited amount of surface water are available in rivers and b33ls and this is almost fully exploited. Ground water is apparently is generally available, Artesian water occurs in a few	The major cropping patterns are Grasspea/mustard/groundnut-Jute-Fallow Boro-DWT.aman Boro-Fallow-Fallow.

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
	deep and shallow poorly grey silty soils, alley with dark grey heavy clays land areas with shallow poorly drained grey.		valleys near Bhaluka in the north and east.	
Northern And Eastern Hills (29)	Relief is complex. Hills have been dissected to different degrees over different rocks. In general slopes are very steep (more than 45%), but more rolling relief occurs locally and a few low hills have flat summits.	High land (92%), Medium high land (2%) Medium low land (<1%) Low land (<1%) Very low land (<1%) Homestead and water bodies (4%) Major hill soils are yellow brown to strong brown, permeable, friable loamy, very strongly acidic and low in moisture holding capacity. Top soils contain 2-5% organic matter under forest, they generally have <2% in soils used regularly for shifting (Jhum) cultivation.	Only limited amount of surface water exist in perennial rivers. Cross dams are built seasonally on some hill rivers and streams to divert water into gravity irrigation channels. Ground water supplies in valleys apparently are erratic, artesian supplies exist locally.	The major cropping patterns are: Mixed evergreen and deciduous forest Thicked & grasses Boro-Fallow-T.aman Rubber Tea.

- e. **Jamalpur** is a district is an important market center for the rice, sugarcane, jute, tobacco, and mustard produced in the region. The city is connected by road, rail, and river with Dhaka and the rest of the country. Total cultivable land is 186058.87 hectares. 29% of the land is under irrigation. Single crop, double crop and triple crops grow in 19.57%, 70.29% and 10.14%; of the land respectively. The four main development challenges in Jamalpur are (i) constantly eroding cultivated land and settlement and displacing people due to shifting of river channels; (ii) early flooding causes crop damage and (iii) unpredictable flood level which varies from year to year during rainy season and (iv) flash flood. The Jamalpur district falls under the Active Brahmaputra - Jamuna Floodplain (Agro Ecological Zone 7), Old Brahmaputra Floodplain (Agro Ecological Zone 9) and Madhupur Tract (Agro Ecological Zone 28). The description of overlapping agroecological zone for Jamalpur is presented in table 5.6.

Table 5.5: Description of the Jamalpur Covered Ago-ecological Zones

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
Active Brahmaputra - Jamuna Floodplain (7)	The region has an irregular relief of broad and narrow ridges and depressions, interrupted by cut off channels and active channels. Local differences	High land (5%), Medium high land (37%), Medium low land (20%), Low land (8%), Homestead and water bodies (30%).	Surface water in rivers and haors is almost fully utilized for dry season (irrigation and fish	The major cropping patterns are Mustard -Aus/Jute-Fallow Mustard - Mixed

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
	in elevation are mainly 2-5 meters.	Soils are mixture of sandy and silty alluvium which occupy most char land. Overall silty deposits are more extensive than sandy deposits. Organic matter content is low (< to 1.7%), neutral to moderately alkaline in reaction.	production). Ground water resources appear to be erratic.	broadcast Aus and Aman Blackgram - millets/Aus/Jute-Fallow
Old Brahmaputra Floodplain (9)	Most areas have broad ridges and basins. The differences in elevation between ridge top and basin centre usually 2-5 meters.	High land (28%) Medium high land (55%) Medium low land (20%) Low land (7%) very low land (<1%) Homestead and water bodies (10%) Dark grey floodplain soil generally predominates. Reaction of the cultivated layer is usually medium to very strongly acidic. Organic matter in the cultivated layer range from about 1-1.5 percent in the ridge soil to 2-5 percent in basin soil.	A limited amount of surface water is available for irrigation mainly from the Old Brahmaputra and Sitalakhya river.	The major cropping patterns are: Mustard-Aus/Jute-Fallow Vegetable(R) - B.aus - Fallow Sugarcane Boro-Fallow-T.aman Fallow-Jute-T.aman
Madhupur Tract (28)	There are six type of physiography in six sub region which are-Level upland area with well drained red brown soil, ii) Closely dissected upland areas with deep well drained red soils on level upland soils and deep broad valleys with grey and dark grey heavy clay, iii) Closely dissected areas with shallow, moderately to poorly drained brown soils, land areas with deep and shallow poorly grey silty soils, alley with dark grey heavy clays land areas with shallow poorly drained grey.	High land (56%) Medium high land (18%) Medium low land (7%) Low land (7%) Homestead and water bodies (10%) Soils are clayey (87%), loamy (13%) and sandy (<1%) organic matter content is low (<1.5%) and pH ranging from 4.5 to 7.8.	Only limited amount of surface water are available in rivers and b33ls and this is almost fully exploited. Ground water is apparently is generally available, Artesian water occurs in a few valleys near Bhaluka in the north and east.	The major cropping patterns are Grasspea/mustard/groundnut-Jute-Fallow Boro-DWT.aman Boro-Fallow-Fallow.

5.2.2 Drought Affected Area

73. Droughts most commonly affect the northwestern region, which generally has lower rainfall than the rest of the country. Chuadanga, Jessore, Naogaon, Natore, Satkhira and Rajshahi are targeted as the drought prone area. The areas mostly fall under high Ganges Flood Plain (11), Level Barind Tract (Agorecological Zone 25) and High Barind Tract (Agroecological Zones 26).

74. The Barind Tract is dominated by agriculture especially under single crop rice (T. aman). Kharif and Rabi/pre-kharif are the two critical dry periods of Bangladesh. The Kharif period hits the highland areas especially in the Barind Tract during June/July to October whereas Rabi/pre-kharif droughts occur during January to May. The drought reduces the yielding of transplanted aman rice during kharif season. The Rabi crops such as boro, wheat, pulses and potatoes and pre-kharif crops such as aus are affected during rabi and pre-kharif season respectively.⁶ In addition to the lower yielding of various types of foodgrains, jute suffers from lack of water for retting and livestock suffers from lack of fodders. Due to the scarcity of surface water, the surface irrigation potential is limited in the drought prone areas.

75. The annual mean rainfall and seasonal average rainfall in the Barind Tract is 1400-1600 mm and 1000 mm respectively. 2°C increase in temperature and a 10 percent reduction in precipitation, run-off in the Ganges, Brahmaputra and Meghna rivers would be reduced by 32, 25 and 17 percent respectively.⁷

76. Due to the unavailability of surface water, ground water is the most important water supply source in the area. The depth of aquifers varies from 0 to 54 m below ground surface. The aquifer is mostly stratified and formed by alluvial deposits of sand and silt with occasional clay. 30% of the extracted ground water by deep tubewell is used for irrigation. Boro cultivation is widely dependent on the groundwater extraction for irrigation. Water scarcity during dry season (November through May) affects the region's higher land. Transplanting of aman rice is often delayed or withheld.⁶ The description of overlapping agroecological zone for drought affected Naogaon, Natore, Nawabganj and Rajshahi are presented in table 5.7.

Table 5.6: Description of the Drought Affected Ago-ecological Zones

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
Level Barind Tract (25)	The Level Barind Tract is almost level, with 60-90cm local differences in elevation. Relief is locally irregular near entrenched river channels. In the west, elevation gradually increases.	High land (30%), Medium high land (55%), Medium low land (4%), Low land (2%), Homestead and water bodies (9%). The predominant soils have grey, silty, puddled topsoil and plough pan. Organic matter content is generally low (<1.5%).	Surface water in rivers and haors is almost fully utilized during dry season (for irrigation and fish production). Ground water resources appear to be erratic.	T.aman is the major kharif crop. HYV aus and aman also grown in the east Deepwater aman also grown in some area of Bogra, Rajshahi, Pabna. With irrigation early rabi crops (especially potato and wheat) are grown. Tube wells are widely used for growing HYV boro paddy.

⁶ Karim, Z., A. Ibrahim, A. Iqbal and M. Ahmad. 1990. Droughts in Bangladesh Agriculture and irrigation schedules for major crops, Bangladesh Agriculture Research Council, Dhaka.

⁷ Selvaraju, R. A.R. Subbiah, S. Baas and I Juergens, 2006, Livelihood Adaptation to Climate Variability and Change in Drought-Prone Areas of Bangladesh

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
High Barind Tract (26)	The region has been filled upward along the western edge. It has short, deep valleys descending to the Ganges, Mahanands and Purnabhoba floodplain to the south and west and long valleys running eastward.	High land (93%) Medium high land (1%) Medium low land (<1%) Low land (6%) Homestead and water bodies (6%) Despite the sloping relief, this region has predominantly poorly, drained soils similar to those occurring on the level Barind Tract. There is a high proportion of soils containing hard lime nodules. Organic matter content is low (<1.5%) pH ranging from 4.5-7.0.	Limited surface water supplies are available in tanks. Ground water supplies generally are poor in the hilly area and somewhat better in valleys.	The major cropping patterns are Fallow-Fallow-T.aman Boro-Fallow-T.aman.
High Ganges River Floodplain (11)	Most area has a complex relief of broad and narrow ridges and inter-ridge depressions. Upper parts of high ridges remain above flood level. Lower parts are seasonally flooded (shallow).	High land (43%) Medium high land (32%) Medium low land (12%) Low land (2%) Homestead and water bodies (11%) Soils are silt loam and silty clay loam in ridges and dark grey clay soils in basins. Most ridge soils are calcareous and basin soils are non-calcareous. Organic matter content in ridges are low (<1.5%) and high (2-5%) in dark grey soil. Soil reaction is neutral in strongly acidic.	Water is pumped from the Ganges river channel to irrigate kharif crops to the southern part of the region. Elsewhere, only limited amount of surface water are available from small river and ox-bow lake to irrigate dry land rabi crops and in bill to irrigate boro paddy.	The major cropping patterns are: Wheat-B. aus/jute-Fallow Wheat - B. aus/Jute-T. aman Mustard-Jute-T. aman Lentil-Sesame-T. aman Sugarcane-Boro-DW T. aman

5.2.3 Salinity Affected Areas

77. Bangladesh is susceptible to increasing salinity of their groundwater as well as surface water resources, especially along the coast, due to increases in sea level as a direct impact of global warming. The coastal zone covers 19 out of 64 districts² facing, or in proximity to, the Bay of Bengal which are exposed to salinity. The coastal districts are: Cox's Bazar, Chittagong, Noakhali, Lakshmipur, Patuakhali, Barguna, Bhola, Jhalokathi, Pirojpur, Feni, Barishal, Chandpur, Bagerhat, Khulna, Satkhira, Shariatpur, Madaripur, Faridpur and Gopalganj. In coastal region, the initially targetted geographic area 5 coastal districts (out of the 19 coastal districts): Sathkhira, Khulna, Bagerhat, Pakuakhali and Barguna.

78. The fresh waters are available in upstream part of rivers, ponds, wetlands and groundwater. Brackish waters are mainly in the estuarine part of the rivers and tidal channels/creeks. Ground water is saline in near surface aquifers throughout most of this region. Sweet water occurs in aquifers at around 300 meters. The soil salinity and surface water salinity are the two sets of salinity problem in Bangladesh.

79. **Soil Salinity:** A total of 1.65 million ha (70%) of 2.34 million ha area of Barishal and Khulna division is affected by soil salinity. The critical salinity level for agriculture is 1 to 5 ppt. 10 to 15 ppt salinity is necessary for Sundori tree. Khulna, Patuakhali (Char land), Bhola (southward) and Chittagong (Swandip) are affected by severe salinity. The salinity is moderate to severe in the north part of Khulna, Bagerhat, Barguna, Pirojpur, Noakhali and Cox's Bazar.

80. **Surface Water Salinity:** Salinity and its seasonal variation are dominant factor for coastal ecosystem, fisheries, agriculture and biophysical system. During dry season (December to March) deep landward intrusion occurs through various inlets in the western part of coastal zone and through Meghna Estuary. A study from CEGIS shows, 5 ppt isohaline intrudes more than 90 km landward at the western part of the coastal area in the Sundarbans through Jamuna-Malancha-Rainmangal river. Freshwater flow decreases in the Pasur-Sibsa river system during dry season and the 5 ppt saline isohaline moves 30-40 km upward. The study also shows that 5 ppt saline front moves inside by 20-25 km from the coastline by Baleshwar- Bishakhali river system. In the middle part of coastal zone along the Meghna estuary, landward intrusion is low due to huge freshwater flow coming through the Meghna river system.

81. The climate of coastal region is dominated by sub-tropical monsoons characterized by wide seasonal variations in rainfall, moderate temperatures and excessive humidity. Mean annual rainfall is about 1,700 mm in the west and 3,300 mm in the south east. Mean annual temperature is about 26.4°C. The whole region lies within the cyclone zone.

82. The major land uses in coastal area are agriculture/fallow lands (63%), settlements (19%), water bodies/rivers and forests. Livelihoods of people living in the coastal area are farming, fishing, wage labor and business. Agriculture in coastal zone are mainly rain-fed and irrigated cropping system. Major crops are local/HYV Aus, transplanted Aman and Rabi crops. Rivers, canals, estuary and marine habitats are hosting economically and ecologically fish species like Hilsa, shrimps etc. Other than the salinity tropical cyclones and storm surges and erosion are the typical natural disaster in the coastal area. All five districts fall under Low Ganges River Floodplain (Agro-ecological zones 13). The description of the agro-ecological zone confining the focused district with salinity intrusion is presented in Table 5.8.

Table 5.7: Description of the Salinity Affected Agro-ecological Zones

Agroecological Zone (#)	Physiography	Land type	Water Resources	Major Cropping Pattern
Low Ganges River Floodplain (13)	The greater part of this region has smooth relief. River banks generally stand about a meter or less above the level of adjoining basins. The region is characterized by a close network of interconnected tidal rivers and creeks.	High land (2%), Medium high land (78%), Medium low land (2%), Low land (<1%), Homestead and water bodies (16%). The general pattern of the soil is grey, slightly calcareous loamy soils on river banks and grey or dark grey, noncalcareous, heavy silty clays in the basin. Organic matter content is medium (1.7-3.4%). Extremely acid soil (acid sulfate soils) occur patchily in basin.	This region is well provided with surface water resources. Most places are less than 500 meters from a tidal river or crack. Ground water is saline in near surface aquifers throughout most of this region. Sweet water occurs in aquifers at around 300 meters.	The major cropping patterns are Boro -Fallow-Fallow-Shrimp - T.aman Fallow- T.aus-T.aman Natural mangrove forest

6.0 CCCP Activities & General Principles of EMF

6.1 CCCP Activities

87 The sub projects to be funded out under CCCP will support the implementation of the strategy and action plan of the BCCSAP by i) strengthening and scaling-up the development of community driven grassroots mechanisms for increasing their resilience to the impacts of climate change; ii) supporting applied and/or action research that would strengthen the community capacity for climate resilient planning to combine investments in hard and soft adaptation options focusing on the poorest and most vulnerable; and iii) developing social policy interventions to take a better account of climate risk. The activities to be carried out in the above 2nd and 3rd categories will be mostly in technical assistance in nature and no physical works are expected. As such no environmental impact is expected on these 2 categories. The 1st category will support mostly physical interventions, which will be implemented at the community levels with the support of NGOs. No major infrastructure will be supported under this category. Only small scale infrastructure, which will improve the community climate change resilience and can be implemented by community without any major technical complexity, will preferably be implemented under this category.

6.2 Possible Physical Interventions

88 The followings are the possible interventions, which will be supported by the CCCP. However, this is not the restrictive list. The NGOs in consultation with the community can propose innovative proposal to improve the community climate change resilience.

- Rural roads construction/re-construction
- Small earthen embankment construction/re-construction
- Excavation of existing canals/Public ponds/Fish Farms
- Other small infrastructure (housing, minor repairing & maintenance of cyclone shelter etc.) with innovative cost effective approach for protection from flood, cyclone
- Minor irrigation
- Agriculture
- Fisheries and aquaculture
- Earthen Shelter for animals
- Land filling
- Organic fertilizer production
- Water Reservoir construction

89 With appropriate planning and implementation, the above small-scale interventions are not expected to create any long-term and significant environmental impacts.

6.3 General Principles of EMF

90 The sub projects to be funded under CCCP will be identified and approved during implementation phase of CCCP. Consequently, specific information on types of sub-project, site/location of the sub-projects, land requirements, local communities, geo-physical land features and nature is not available. Therefore, exact details and intensity of environmental impacts and their effective mitigation cannot be determined during project preparation. This EMF is thus prepared to establish the mechanism to determine and assess future potential environmental impacts of SGP that are to be identified and cleared based on a community demand driven process, and to set out mitigation, monitoring and institutional measures to be taken during implementation and operation of the sub project to eliminate adverse environmental impacts, offset them, or to reduce them to acceptable limit. This section therefore, describes the general principles of Environmental management in CCCP.

91 The PKSf will follow a set of principles in implementing the Community Climate Change Project to ensure environmental sustainability of the project. In the view of EMF objectives and assessment of the nature, the planning and implementation of the project activities will be based on the following principles, most of which are incorporated in the project design and implementation arrangements. A set of negative list of sub project that will not be financed under the project is presented in Annex-C.

General principles

- The Project Coordinator or his/her assigned official having environmental background at the PKSf Project Office will be overall responsible for environmental compliance in CCCP.
- All the SGPs to be funded under the CCCP will be subject to an environmental screening in order to prevent execution of projects with significant negative environmental impacts. The completed screening format should be submitted with the proposal.
- If negative environmental impact is expected during screening, PKSf will recommend the NGO to conduct Initial Environmental Examination (IEE) in order to prevent execution of SGPs with significant long-term negative environmental impacts.
- Mitigation measures for less significant environmental impacts will be developed by the NGOs and will be reviewed by PKSf.
- PKSf will ensure due diligence to the related government rules (laws, ordinance, acts, etc.) and World Bank Operational Policies and guidelines related to environment are being followed in subprojects selection and implementation. The EMF would serve as the basis for ensuring the compliance.
- Prior to submission of proposal, the PIP will undertake community consultation regarding their objectives, scopes as well as environmental safeguard implications.
- The Project will not support any activities which may have significant long-term environmental impacts (In special circumstance, Category 'A' or 'Red' category project can be considered with appropriate assessment).
- No SGP activities will be carried out in disputed lands or lands restricted for development or Environmentally Sensitive areas.

- PIP/NGOs will be responsible for obtaining and ensuring clearance required from local government agencies as necessary.
- CCCP will promote environmental sound design and environmental capacity building.
- Climate resilient and flood proofing considerations will be integrated in designing relevant subprojects.

6.4 Requirements of Environmental Clearance

92 NGO: The implementing NGO will be responsible to screen, take mitigation measures and monitor the environmental issues in preparation, implementation and operation & maintenance (O&M) phase and an environmental person should be engaged at all phases. The NGO will environmentally screen the entire sub project and submit the screening result with the SGP. The NGO will identify the possible environmental impact. If any environmental issue has been identified, NGO will propose the possible mitigation measure. The proposal should include detail screening, mitigation measure and monitoring plan. NGO nominated environmental personnel will submit the quarterly monitoring report on environmental compliance at project preparation, implementation and operation & maintenance phase. Any environmental document submitted by the NGO should be performed and endorsed by an environmental specialist and will be submitted to PKSf.

93 PKSf: All the sub-grant proposals should be reviewed and assessed first at the PKSf and an environmental professional will be part of the review process. The proposal review committee at PKSf will review detail screening result, the mitigation and monitoring plan submitted with the proposal. The committee can ask for further clarification or strengthening the mitigation and monitoring plan. PKSf will develop its own monitoring plan to oversee environmentally critical sub-project. In addition, the concerned environmental professional/specialist of the technical committee and the Program Officer (Environment) will review the monitoring plan submitted by the NGOs to review the environmental safeguard issues in sub- grant projects. PKSf will appoint a Program Officer (Environment and Natural Resource Management) with Environment Specialization at PMU who will monitor the environmental safeguard issues in the selected sub-projects and publish annual report on environmental compliance of subprojects based on agreed monitoring indicators. The annual monitoring report will be shared with Department of Environment. During project preparation, PKSf will share the EMF with the Department of Environment for their review and concurrence.

7.0 Potential Environmental Impacts of CCCP

7.1 Introduction

94 Adverse environmental impacts of any intervention can be direct and indirect. Although direct impacts often receive more attentions, indirect effects can be equally significant, gradually inducing changes to the environment, population and use of land. Although most of the project impacts would be localized due to the relatively small scale activities, there are some issues of concern that cut across the range of proposed interventions. Field studies and lessons from similar programs show that issues such as community involvement, community ownership and selection of appropriate sites are some of the key concerns that influence project success and sustainability. This chapter provides briefly the potential environmental direct and indirect impacts of the possible CCCP interventions. The potential environmental impacts of the possible sectors/subprojects indentified in the section 6.2 will be explained here. These environmental impacts are very generic and may vary from one location to another.

7.2 Typical Environmental Impacts

7.2.1 Loss of Top Soil of Agricultural Land

95 Earthen embankment or other small-scale infrastructure like housing, improvement of drainage facilities, minor community centers, health care facilitates, sanitation, community water supply system etc. involve one or more of several diverse activities: demolition, site-clearing, excavation, pipe laying, soil grading, leveling, and compacting. The most of these activities are related to the earthen works. This will require use of soil materials. The practice of soil collection from the top soil layer of agricultural land deprives the land from fertile ingredients, which reduce the agricultural production. Such impact can be avoided by collection of soil from barren land or stockpile top soil and replace it later on. Soil can also be collected from existing borrow pits/ponds nearby, which will help increased fish production from those areas.

7.2.2 Change in Land Use and Loss of Agricultural Land

96 Construction of new alignment for road, small infrastructure or embankment may change the topography of the project area. Agricultural land may gradually be converted to non-agricultural uses. Improving the rural embankments or roads by widening/or increasing height will cause embankment/road-side agricultural land loss. While it is not possible to avoid the agricultural lands, the mitigation measure is to provide steep slopes for the embankment/road by applying improved soil stabilization means to minimize the land loss. Among others grass turfing or vetiver grass plantation could be effective means in minimizing erosion.

7.2.3 Drainage Congestion/Water Logging

97 The construction of rural road, rehabilitation of small earthen dam/embankment and other small infrastructure may interfere with cross drainage and can cause flooding or drainage congestion in adjacent areas during period of high rainfall. This may affect commercial activities in the market and cause potential risk to community health, crop damage and in extreme cases long-term loss of agricultural lands. Possible drainage congestion/water logging should be properly addressed and taken in consideration during design phase of the project.

7.2.4 Erosion and Siltation

98 In general, the constriction of waterways by embankment and roads increases velocity of flow to cause erosion during floods and subsequent siltation in the downstream. Improper drainage may cause erosion of embankment and road surface and side slope during rainy season exerting adverse impact on adjacent lands.

99 Additionally, removal of natural land cover, excavation, extraction of construction materials, badly managed open furrow agriculture, deforestation, or draining wetlands and irrigation can result in soil erosion. Irrigation normally carried out before the rainy season and irrigated land may be less able to absorb rainfall since it is already wet. Runoff from irrigated croplands during a storm can carry more sediment and any farm chemicals into water bodies. The effects of sedimentation on rivers are compounded by any changes in flow regimes caused by irrigation structures. Increased sedimentation upstream can also clog irrigation intakes, pumps, filtration operations and in-field channels downstream. Poor design, construction and placement of water inlet points for irrigation can all erode the soil at the head of an irrigated field. The eroded soil may accumulate in the middle or at the tail ends of the field where the water moves more slowly, interfering with in-field water distribution. These things should be properly addressed and taken in consideration during design phase of the project.

7.2.5 Losses of Trees and Vegetation

100 Small scale infrastructure, roads and earthen dam/embankment construction and widening or other development works may require removal of trees and other vegetation. While some trees may need to be removed because they are in the path of widening activities or because they pose safety hazards, there are many which could be saved through the cutting back of branches. The road and embankment-sides may be used for plantation of similar species, which will compensate the losses trees and vegetation.

7.2.6 Increased Unwanted Vegetation

101 Use of unplanned and excessive fertilizer manure in agricultural land may wash into the nearby water bodies and cause unwanted vegetation by providing excess nutrients in the ecosystem. There may be major leakage and evaporation from canals and storage dams, as well as poor water management by farmers within the scheme; these problems are particularly acute

under arid or semiarid conditions. Poorly maintained canals result in water losses and the growth of vegetation in the canals, with noticeable effects on efficiency, distribution and leakage.

7.2.7 Dust and Noise Pollution

102 Dust pollution occurs due to handling of soils during construction and mainly from lack of watering of earth surface. Such pollution is also a function of weather condition - in dry season nuisance is more; during rainy season, dust nuisance subsides. Dust is of more consequences during pre-construction / construction stages. Noise pollution is normally due to some construction related works.

7.2.8 Water Pollution

103 Irrigation can affect downstream water quality by reducing the amount of water available to dilute contaminants and by potentially increasing agrochemical pollution. In addition, commercial irrigated farming projects normally use fertilizers, but overusing them puts excess nutrients in the ecosystem. Nitrates, which are water-soluble, are quickly transported into rivers and canals. Phosphates attach to soil particles, but may eventually seep through to contaminate groundwater or be carried in rainwater runoff to rivers, streams and lakes. As phosphate concentrations rise, they may stimulate rapid growth of aquatic vegetation and algae.

104 Improper disposal of solid and liquid wastes from the people working in the construction sites may also pollute the nearby water bodies. In addition, if the rainwater reservoir is constructed for drinking purpose, proper care including disinfection is required to ensure the water quality.

7.2.9 Loss of Natural Habitat and Biodiversity

105 The clearing of existing vegetation during construction and the development may result in the complete loss of associated ecological habitats and their fauna. Small earthen dam/ Embankment or road construction may encroach on wetlands, which can alter the ecology or wetlands/swamplands and cause destruction of aquatic habitat. The construction of embankments has important consequences on flood plain ecology. Embankments prevent longitudinal and lateral migration of fishes in the flood plain and obstruct movement of fishes onto natural feeding and breeding grounds in flood plains. Excessive shrimp farming will destroy the mangrove in the coastal areas. Improper design of minor irrigation system and unplanned use manure to the agriculture field, choice of crop may also lead to the introduction of exotic or non-indigenous flora and fauna that may destabilize local plant and animal communities.

7.2.10 Soil salinity

106 Salinity problem is one of the environmental impacts of irrigation. Almost all water (even natural rainfall) contains some dissolved salts. When the plants use the water, the salts are left

behind in the soil and eventually begin to accumulate. Since soil salinity makes it more difficult for plants to absorb soil moisture, these salts must be leached out of the plant root zone by applying additional water. Salinity from irrigation water is also greatly increased by poor drainage and use of saline water for irrigating agricultural crops. The salinity problem causes (1) detrimental effects on plant growth and yield (2) damage to infrastructure (roads, bricks, corrosion of pipes and cables) (3) reduction of water quality for users, sedimentation problems and (4) soil erosion ultimately, when crops are too strongly affected by the amounts of salts.

7.2.11 Occupational Health and Safety

107 Since the project activities does not include any large construction and risky activities, it is expected that no major occupational health & safety issues. However, attention should be provided on communicable diseases among workers and illness due to water pollution. First Aid facilities recommended addressing any minor accidents during project works.

7.3 Possible Environmental Category of CCCP

108 The sub projects to be supported under CCCP may include different sector as per the project categorization of ECR'97. However, considering the targeted implementation partner (PIP/NGOs) and possible nature of the project, no specific categorization in the line of ECR is proposed at this stage. Since the exact nature and location of the sub-project is yet to be identified, CCCP is identified as Category 'B' project as per OP/BP 4.01. As mentioned earlier, all the sub grant proposal (SGP) will be subject to environmental screening and only the intervention having no significant environmental impacts will be funded through CCCP. If the potential environmental impacts are expected to be minimal and temporary, an Environmental Management Plan (**EMP**) with mitigation measures will be prepared for each relevant activity and will be submitted with the proposal.

8.0 Environmental Management in CCCP

8.1 Environmental Screening

109 The ‘environmental screening’ is a mandatory requirement for the design of a project or sub-project. The purpose of the environmental screening is to get relevant concerns addressed early on before further decision and/or design of a sub-project and to ensure that actions to mitigate environmental impacts or enhance environmental opportunities are budgeted for. It is the first step to understand the possible environmental impacts and also to identify the environmental categorization of the project or sub-project. The participation and consultation with local communities are important in identifying the potential impacts of the project interventions. The screening format for the sub grant projects under CCCP is provided in Annex-D. The proposed screening criteria have been selected from the experience of other project and typical environmental impacts of the proposed project interventions.

110 It is the responsibility of the NGO to carry out the environmental screening. Screening will go hand in hand with project proposal. This way environmental opportunities and risks can be appropriately integrated into subsequent design stages, rather than being brought in at the last minute. A sample screening format usable at proposal stage is attached in Annex-D. The Bangla form will be used for the screening purposes at field level. Using the screening form, proposed sub projects will be screened by respective NGO, to identify any potential adverse impacts/effects from the sub project activities. If the screening identifies significant environmental impacts like possibility of drainage congestion in the adjacent areas due to the new embankment or uses of excessive agrochemicals or shrimp farming encroaching the mangrove area, the sub-projects will not be recommended for financing under CCCP.

8.2 Environmental Mitigation Measures

111 Once impacts are identified, the necessary mitigation measure would then be recommended and the sub-grant project would be designed to implement these mitigation measures. The environment specialist (hired/nominated on a contractual basis by the NGO) will review the environmental screening and suggest appropriate mitigation measures elaborately at the proposal stage. The detail mitigation measures will be submitted with the Sub-Grant Project Proposal. The NGO with the help of the environment specialist will prepare a simple environmental management plan for the subproject. A sample environmental management plan format is attached Table 8.1 and Table 8.2 Annex-E provides some sample sub-grant project specific mitigation measures.

112 The PIP/ NGO focal point along with the environment specialist of the PIP will estimate the cost for the environmental mitigation of the sub grant projects and will submit with proposal.

For example, if the sub grant project requires plantation to compensate the trees lost due to construction/expansion of roads/embankment, the cost of plantation of similar species must be considered in sub project design.

8.3 Environmental Review and Approval

113 After receiving the SGP, the PKSf will go through a screening for environment. If any environmental issue raised, the SGP has to include the proposed mitigation measure and Environmental Management Plan. PKSf will appoint a full time Program Officer (Environment and Natural Resource Management) with Environmental specialization at PMU. S/he will be the focal person for environment. The environmental screening will provide information to PKSf about the nature of the sub project at initial stage. PKSf will determine the significance of the environmental effects of the proposal stage sub project and can provide the recommendation on alternative measures and key focus areas in initial environmental examination (IEE). The proposed sub project in the environmentally sensitive areas or proposed subproject with significant and long-term environmental impacts will not be recommended. The proposed activities with moderate and localized environmental impacts will be recommended for initial environmental examination (IEE) along with mitigation measures and EMP for further considering the SGP. If no environmental issue has been identified in the environmental screening and PKSf is satisfied with the screening results, no further environmental assessment i.e., IEE will be required for the subproject for approving the SGP. However, the NGO will conduct regular monitoring and develop EMP, even though no severe environmental impact is identified from the screening.

8.4 Initial Environmental Examination (IEE)

114. The IEE is a review of the reasonably foreseeable effects on the environment of a proposed development intervention/activity. The IEE is conducted if the project is likely to have minor or limited impacts, which can easily be predicted and evaluated, and for which mitigation measures are prescribed easily. However, the IEE is also used to confirm whether this is, indeed, requires an EIA as a follow up.

115. An standard IEE process includes: i) preparing an environmental baseline; ii) partial assessment of environmental impacts; iii) identifying mitigation measures; iv) preparation of environmental management plan (EMP) - preparation of environmental mitigation and monitoring plan including responsibility and estimation of budget for implementation of mitigation and monitoring plan.

116. The proposal stage Project Implementing Partners (PIP) will prepare the initial environmental examination (IEE) in parallel to SPP development. Since most of the PIPs do not have internal capacity to prepare the IEE, it is recommended that PIP should hire a qualified environmental professional to prepare the IEE.

8.4.1 Steps to be Followed to Carry Out IEE

117. The PIPs need to carry out the following actions to prepare the IEE:

- Scoping and ToR for IEE: An early step is to determine the scope of the IEE study. This activity is known as "scoping" as a procedure designed to establish the terms of reference (ToR) for the IEE. The ToR helps in defining the responsibility of the environmental professional for carrying out IEE. The scoping procedure should at least produce the following outputs: i) identify the likely environmental impacts or other environmental concerns and consideration that need to be further investigated in IEE study; ii) identify environmental component which need detailed or further study; iii) determine the general approach and methodology required to carry out the IEE study; iv) identify in general all affected interest to be consulted in carrying out IEE study; and v) identify the need to fit the outputs of IEE into the project context especially on environmental management and monitoring plan.
- PKSF Orientation: Participate in the PKSF orientation on how to apply prepare and submit the Sub-Grant Proposal. The relevant orientation section will explain about the initial environmental examination (IEE) and expected documentation.
- Describing Environmental Condition of the Project Area: This is the first main step of the initial environmental examination (IEE) study. This includes collection of baseline information on biophysical, social and economic aspects of the project area. This is the most important reference for conducting IEE study. The description of environmental settings includes the characteristic of area in which the activity of proposed project would occur and it should cover area affected by all impacts including potential compensation area, and potential area affected by its alternatives. Normally, information is obtained from secondary sources when there is a facility of maintaining database, or other existing documentation, and through field sampling. Collection of baseline data should be designed to satisfy information requirements and should focus on relevant aspects that are likely to be affected by the proposed project. Therefore, the level of detail in this description of study area should be sufficient to convey to readers nature of environmental and social resources condition of the affected areas.
- Assessing the potential impact: Prediction and quantification of the potential impact is the technical heart of the environmental assessment/examination process. The issues identified at the environmental screening will be further examined in detailed in assessing the impact. The process involves the prediction of changes over time in various environmental aspects as a result of a proposed project. The impacts of the pre-construction, construction and post-construction operation & maintenance activities will be separately identified. The prediction of the nature, extent, and magnitude of environmental changes likely to result from a proposed project is aided by various tools and techniques, the choice of which depends upon the impacts of concern, data availability or lack thereof, and the appropriate specificity of quantitative models. The consultant needs to identify appropriate methods depending on the situation and predict the changes on ecology, human health, social life etc. Consultation with the affected people, beneficiaries, local government agency, other NGOs working in that area are extremely important.

- Formulating Mitigation Measures: Once the impacts have been analyzed, then determine the significance of the impacts i.e., whether they are acceptable, require mitigation, or are unacceptable. Subsequently, measures will be devised to mitigate anticipated environmental changes and consequential impacts during project implementation and operation, or further reduce the residual environmental changes inherent in the selected project design. They normally include technical, social, and institutional measures to be implemented as integral elements of the project. In cases, where mitigation measures not directly possible like cutting of trees, compensation measures i.e., plantation of more trees of similar species should be considered. The standard mitigation measures for the different sectors mentioned in the section 6.2 are described in Annex-E.
- Environmental Management Plan (EMP): An EMP is a plan of scheduled actions that follows directly from a completed environmental assessment of a project. An EMP is the organized expression of the environmental safeguards for the project. EMP has 2 parts: i) Environmental Mitigation Plan; ii) Environmental Monitoring Plan.
- Environmental Mitigation Plan: The mitigation plan is a major sub-plan of the EMP. The mitigation plan manages the potential negative impacts of the project. A mitigation measure is a modification of a proposed project activity using different types of categories of actions, which can be applied individually or together to form a mitigation measure: i) deletion of activity; ii) change in location of activity; iii) change in timing of activity; iv) change in intensity of activity; v) isolation of activity with physical or chemical barrier and vi) social or environmental compensation. The mitigation plan to be prepared by the consultant should specify the following information for all potential negative and positive impacts of a project: i) description of mitigation measure to prevent or reduce negative impact; ii) location of mitigation measure; iii) schedule and frequency of mitigation measure implementation; iv) responsibility for implementing mitigation measure; v) key indicator of effectiveness of mitigation measure; vi) reporting requirement and reporting schedule for mitigation activity; and vii) estimated cost of mitigation measure. PIP will use the following template (Table 8.1) in preparing the environmental mitigation plan. Elements of the template for impacts mitigation plan in Table 8.1 are defined below.

Activities at Preparation:

Subproject activities that occur before primary construction or project interventions begin. Example activities include land surveys, public consultations, land acquisition, and resettlement.

Activities during Implementation:

Primary construction activities, and other activities that define the implementation of the project. Example: activities include land and civil works.

Operation and Maintenance Activities:

Activities those are associated with the operation and maintenance of the completed subproject or facilities.

Project Activity:

A specific subproject activity which is believed will cause a potential impact. Impact causing project activities are identified by IEE.

Potential Environmental Impact:

Brief description of the potential negative impact of the subproject activity identified by IEE.

Mitigation Measure:

The mitigation measure is the action to be taken to prevent or reduce a potential negative impact of the subproject Activity. Mitigation activities are always subproject and activity specific. Mitigation measures are identified by the IEE.

Location:

Specific subproject location(s) where the mitigation measure will be implemented.

Estimated Mitigation Cost:

The estimated cost of the mitigation measure over and above the cost of implementing the related project activity.

Responsibility:

Implementation

PIP field level staff in association with community will implement the mitigation measures according to the plan.

Supervision

PIP Head office officials will supervise the implementation of all mitigation measures at the PIP level. PKSf will also supervise the implementation.

Table 8.1: Template for Environmental Mitigation Plan

Sub-project Activity	Potential Environmental Impact(s)	Mitigation Measures	Location	Estimated Mitigation Cost	Responsibility	
					Implementation	Supervision
<i>Activities at Preparation Stage</i>						
<i>Activities at Implementation Stage</i>						
<i>Operation & Maintenance Phase Activities</i>						

- **Environmental Monitoring Plan:** The environmental monitoring is another part of the EMP. Environmental monitoring involves: (i) planning a survey and realistic sampling program for systematic collection of data/information relevant to IEE and environmental management; (ii) conduct of the survey and sampling program; (iii) analysis of samples and data/information collected, and interpretation of data and information; and (iv) preparation of reports to support environmental management. PIP will carry out environmental monitoring during the IEE to establish baseline data needed for Environmental assessment and evaluating environmental impacts during subproject implementation. The results of the monitoring program are used to evaluate the following: (i) extent and severity of the environmental impacts against the predicted impacts; (ii) performance of the environmental protection measures or compliance with pertinent rules and regulations; (iii) trends in impacts; and (iv) overall effectiveness of the project environmental protection measures. Environmental monitoring should have clear objectives, and the survey and sampling program custom-designed to focus on data/information actually required to meet the objectives. In addition, the design of the monitoring program has to take into account its practicability considering the technical, financial, and management capability of the institutions that will carry out the program and period of monitoring that will be needed to achieve the objectives. It should also be constantly reviewed to make sure that it is effective, and determine when it can be stopped. Table 8.2 provides the template for the environmental monitoring Plan. The plan consists of two type of monitoring: 1) monitoring for effectiveness of mitigation measures; and 2) general environmental effects monitoring. The information contained in the template needs to be completed by the PIPs. Elements of the template for environmental monitoring plan in Table 8.2 are defined below.

Mitigation Indicator (Table 8.2a):

The mitigation measures listed in Table 8.1 will be listed in the same order in Table 8.2. For each mitigation measure, a meaningful indicator(s) for the effect of the mitigation measure will be identified.

Potential Environmental Impact Indicator (Table 8.2b):

For each potential environmental impact identified by IEE, a meaningful indicator(s) for the effect of the mitigation measure will be identified.

Location:

Specific subproject location(s) where environmental monitoring will be carried out.

Procedures and Methods:

Specific methods for the design, sampling, analysis, and reporting for environmental monitoring that will be followed, or considered are identified.

Table 8.2: Templates for Environmental Monitoring Plan

A) MITIGATION MONITORING							
Mitigation, & Environmental Indicator	Location	Procedures / methods	Frequency / Duration	Baseline / Environmental Standards	Responsibilities		Estimated Cost
					Implementation	Analysis/ Reporting	
<i>Activities at Preparation Stage</i>							
<i>Mitigation/ Indicator</i>							
<i>Mitigation/ Indicator</i>							
<i>Activities at Implementation Stage</i>							
<i>Mitigation/ Indicator</i>							
<i>Mitigation/ Indicator</i>							
<i>Operation & Maintenance Phase Activities</i>							
<i>Mitigation/ Indicator</i>							
<i>Mitigation/ Indicator</i>							

B) ENVIRONMENTAL IMPACT MONITORING

Potential Environmental Impact & Indicator	Location	Procedures / methods	Frequency / Duration	Baseline / Environmental Standards	Responsibilities		Estimated Cost
					Implementation	Analysis/ Reporting	
<i>Activities at Implementation Stage</i>							
<i>Impact/ Indicator</i>							
<i>Impact/ Indicator</i>							
<i>Operation & Maintenance Phase</i>							
<i>Impact/ Indicator</i>							
<i>Impact/ Indicator</i>							

Frequency/ Duration:

The number of times (per - day, week, month, or year) biophysical or social samples will be collected, and the total time period during which the sampling occurs.

Baseline / Environmental Standards:

The baseline - preconstruction - condition of the indicator variable(s) will be determined with initial baseline sampling. The baseline level of the indicator will be used to gauge the effects of mitigation measure or impact when compared to monitoring data collected during and after construction phase. Existing environmental standards or criteria for the indicator variable are also identified and subsequently compared to the indicator during all phases of the subproject to assist with determination of whether the mitigation measure is effective, or whether an impact has been registered.

Responsibility:***Implementation***

If PIP lacks in-house expertise, it will outsource the implementation of the monitoring program to an environmental specialist or firm.

Analysis / Reporting

The analysis and subsequent reporting of the results and recommendations of the environmental monitoring plan is a joint responsibility between the consultant of the plan, and the PIP. The consultant is responsible to prepare a timely report which clearly indicates the performance of all mitigation measures, and whether other unpredicted impacts are occurring. PIP then will prepare all necessary reports that need to be submitted to PKSf.

Estimated Cost:

It includes survey, laboratory works (if required) and reporting costs. The item-wise budget should be prepared for better cost estimation and accountability. If the works is outsourced, all the costs will be included in the consultant budget.

8.5 Appraisal of Proposal at PKSf

118. After receiving the complete SGP including the IEE report, the Project coordinator will form an appraisal team comprising project staff members and experts from outside. The Project Environmental Officer or Environmental Expert will be the appraisal team member. The appraisal will be divided into major steps: i) Concept review phase and ii) proposal review phase. The sample review checklist at project concept stage and proposal stage is added in Annex-F

Concept review

119. The team will initially undertake a desk review of the SGP and share their preliminary assessment. The environmental team member will check that IEE report contains all the required

section of it. The committee will also assess the adequacy of the mitigation measures and EMP for proposal which will not require any EMP. If the proposal does not sufficiently include all information required, the applicant organization may be contacted to furnish with the information to justify a detailed appraisal. A sample desk review format for PKSf is attached to Annex F.

Proposal review

120. The detailed appraisal may include the following steps: i) A presentation by the applicant at PKSf or applicant's office on core appraisal issues; ii) Field visits to observe the physical areas and the communities to work with; iii) Interviews with the core personnel proposed in the project; iv) Review of the documents submitted during application; and v) Scoring the assessment in different areas of appraisal. The environmental team member will carryout a field visit and will carryout focus group discussions with the communities. The quality of the baseline information, identification of potential impacts, effectiveness of the mitigation measures and the adequacy of the mitigation and monitoring plan will be critically reviewed and assessed by the environmental team member. The leader of the appraisal team will compile the individual scores of the different team members and submit the appraisal report along with the aggregate score to the PC for further action.

8.6 Compliance Check by IDA

121. PKSf will seek concurrence of the World Bank Team in view of their compliance with environment guidelines. IDA can ask for further clarification for strengthening the environmental documentation. In that case, the Project Coordinator will ask the respective applicant organization to revise the specific areas related to environmental documentation. The Project Coordinator will resubmit such a SGP through the Technical Committee and Managing Director to the IDA for re-examination.

8.7 Environmental Monitoring at PKSf Level

122. In addition to the environmental monitoring plan prepared and implemented by the PIP, PKSf will develop its own monitoring mechanism to ensure proper implementation of the environmental mitigation activities to avoid any negative environmental consequence from the subprojects. The monitoring will be carried by 2 levels: i) internal monitoring and ii) external monitoring/evaluation.

8.7.1 Internal Monitoring

123. PKSf will develop the capacity of the Program Officers (POs) to carry out the environmental monitoring as part of their regular monitoring of the subproject implementation. The PO will undertake monitoring visits quarterly and seek the validation of the environmental monitoring already undertaken by the PIPs. Each PO will prepare his/her own monitoring report on quarterly basis and will share the environmental section with the PKSf's Program Officer (Environment and Natural Resource Management). The PO (Environmental and Natural Resource

Management) will review the report and may have separate discussion with PO on environmental monitoring data, PIP capacity and further action. The PO (Environment and Natural Resource Management) will also carry out field visit on certain percentage of the subproject. S/He will monitor the environmental safeguard issues in the selected sub-projects and publish annual report on environmental compliance of sub grant projects based on agreed monitoring indicators. The annual monitoring report will be shared with Department of Environment. During project preparation, PKSf will share the EMF with the Department of Environment for their review and concurrence. The annual monitoring report prepared by PKSf will also be shared with Bank. Bank will review PKSf's summary report and can request for further clarification, if needed.

8.7.2 Third Party Assessment/External Monitoring/Evaluation

124. PKSf will hire the services of a consulting firm to carry out the external monitoring/evaluation of the subprojects. The team will include an environmental specialist who will assess the implementation of environmental mitigation and monitoring activities and also evaluate impact on environment. Based on the evaluation result, PKSf will take remedial measures (if required) with IDA's concurrence. The timing and frequency of the external monitoring will be decided by the PKSf based on the number of the sub grant projects to be funded under CCCP. The independent environment evaluation will ensure correctness of the sub-project wise Environmental assessment and implementation of the environmental management plan (Monitoring and mitigation). The TOR for the environmental Specialist of the Third Party monitoring Firm is included in Annex-H. A summary of the key steps of the environmental management is shown in the Figure -8.1.

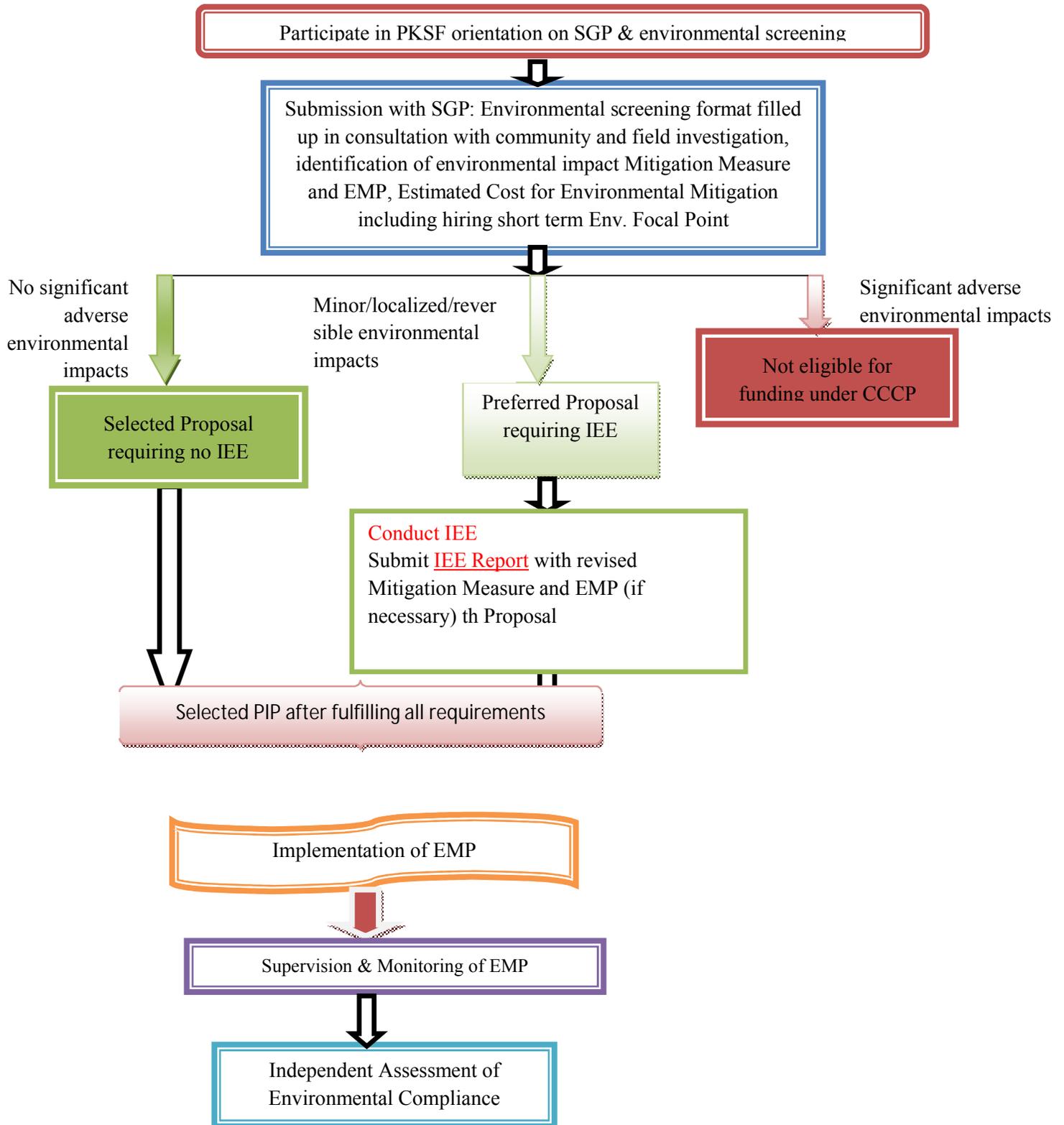


Figure -8.1: Key Steps of Environmental Management in CCCP

8.8 Grievance Redress System

125. Grievance Redress Mechanism (GRM) will be established at central (PKSF) and subproject level to deal with any complaints/grievances about environmental issues. At the subproject level, the Union Parishad (U/P) Chairman or his/her nominated representative from the U/P will be the Local Grievance Redress (LGR) focal point. At the PKSF central level, the Program Officer (Environment) or any other person/staff nominated by the Project Coordinator will be Central Grievance Redress (CGR) focal point. The aggrieved persons or entities will submit the complaints/grievances in sealed envelopes to the PIP office duly entered in the Grievance Register (GR) and will collect a receipt with entry reference to the GR. PIPs will not open the envelopes, but inform the LGR focal point about receipt of complaints and schedule hearings as per his/her advice. In open meetings, the PIP will facilitate the LGR focal point to hear and discuss the complaints and resolve them in view of the applicable guidelines of the EMF. The aggrieved person, if female, will be assisted by a female U/P member in hearing, and if from a tribal community, by a tribal representative. LGR focal point with the help of PIP will ensure sending a copy of the complaint by postal mail, fax or other means to the Project Coordinator at the PKSF headquarters. All grievances at PIP level will be disposed within 15 days, failing which the petitioner can seek resolution from the CGR focal point.

126. The PIPs will forward the unresolved cases with all proceedings to the CGR focal point within 7 days of taking decision by the LGR focal point. Unresolved cases forwarded by PIPs will be registered in the office of the CGR focal point and disposed within 15 days. If any decision made by CGR focal point is unacceptable to the aggrieved persons, he/she will forward the complaints with all proceedings to the PKSF MD through the Project Coordinator. The MD will review and resolve the cases which will be final for PKSF. The MD may seek advices from the PKSF Chairman for any critical issues as per his discretion. A decision agreed by the complainants at any level of hearing will be binding on the concerned PIPs and PKSF. The GRM will, however, not pre-empt an aggrieved person's right to seek redress in the courts of law.

127. The aggrieved persons or entities will have the option to lodge the complaints directly to the CGR focal point if they are against the NGO, to the PKSF MD if they are against the PKSF project management or directly to the Management Committee at BCCRF Secretariat if there is any issue related to PKSF itself. The institutional arrangement of Grievance Redress Mechanism is illustrated in the Figure – 8.2.

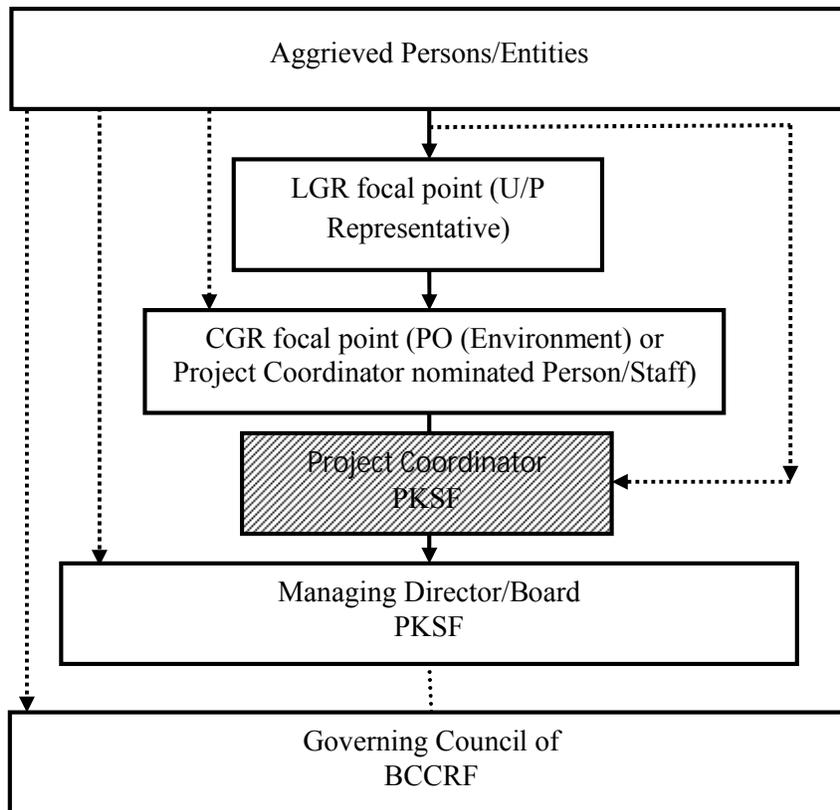


Figure 8.2: Institutional Arrangement of the GRM

128. NGOs/PKSF will keep the records of all resolved and unresolved complaints and grievances and make them available for review -- as and when asked for by the development partners and others interested in climate change issues. The provision of GRM and the process will be well disclosed to the community and the likely affected persons before implementation of subprojects. The disclosure will be done by the NGOs and ensured by PKSF PO (Environment and Natural Resource Management).

9.0 Institutional Arrangement & Capacity Development

9.1 Institutional Arrangement

129. The key stakeholders are: i) Non Government Organizations (NGO) Participated in PCN submission; ii) Community; iii) Short Listed NGO; iv) Project Implementation Partner (PIP); v) PKSF Program Officer (Environment and Natural Resource Management); vi) Project Coordinator; and vii) A think tank as independent assessment or third party monitoring. Table-9.1 summarizes the responsibilities of different stakeholder in environmental management of the CCCP.

Table -9.1: Responsibilities of Different Stakeholders

<i>Responsible Entity/Person</i>	<i>Responsibility</i>	<i>Working Phase</i>
Community	Participation and contribution to <ul style="list-style-type: none"> • Environmental screening • Preparation and implementation support to EMP 	<ul style="list-style-type: none"> • Proposal Submission • Implementation • Operational and Monitoring
Proposal Stage NGO involving Environmental Focal Point	<ul style="list-style-type: none"> • Environmental Screening • IEE, if required • Mitigation Measures • Preparation of EMP • Provide Training to NGO on Environmental compliance in implementation 	<ul style="list-style-type: none"> • Proposal Submission • Implementation • Operational and Monitoring
Project Implementation Partner (PIP) involving Environmental Focal Point	<ul style="list-style-type: none"> • Environmental Monitoring • Submission of quarterly monitoring report to PKSF 	<ul style="list-style-type: none"> • Implementation • Operational and Monitoring
PKSF Program Officer (Environment and Natural Resource Management) with environment background	<ul style="list-style-type: none"> • Provide Training on Environment at Proposal stage • Prepare Training Materials • Review of subproject proposal • Monitoring of database • Overall environmental monitoring • Maintaining environmental database at PKSF • Prepare annual report on environmental compliance 	<ul style="list-style-type: none"> • Proposal Submission • Implementation • Operational and Monitoring
Project Coordinator/Director	<ul style="list-style-type: none"> • Review, finalization and approval of Sub-projects • Overall monitoring • Send annual report on environmental compliance 	<ul style="list-style-type: none"> • Proposal Submission • Implementation • Operational and Monitoring
Think Tank	Independent Assessment and/or third party monitoring	

9.2 Capacity Development at PKSf

130. PKSf has developed its own guidelines for management of microenterprise environmental health and Safety (EHS) risks. The guidelines was revised and updated on August, 2004. The objectives of the guidelines were to: (i) prevent any significant adverse environmental impacts arising as a result of either individual or cumulative microenterprise activities; (ii) mitigate any minor local adverse environmental impacts resulting from microenterprise activities; (iii) protect the health and safety of those workers directly involved in microenterprise activities; and (iv) promote, where possible, environmentally beneficial outcomes from microenterprise activities.

131. The suggested procedures include: (i) investment proposals will have to be conformed with the EHS standard set out in the guidelines; (ii) it is mandatory that the partner organizations refer to the checklist to assess the EHS impacts which must be incorporated into the mainstream investment proposals for processing loans for microenterprises; (iii) monitoring and implementation of EHS standard must be carried out by the Partner Organizations; and (iv) regular EHS risk mitigation audit must be undertaken by Partner Organizations and PKSf.

132. The rapid assessment carried out during the environmental management framework preparation reveals that PKSf requires capacity building support to train their staff to implement the EHS guidelines. In addition, PKSf will dedicate one qualified environmental professional for its institutional development on sustainable development, environment, occupational health and safety. The Program Officer (Environment) to be hired under the project will also lead the capacity building initiative in PKSf. The job description of the Program Officer (Environment and Natural Resource Management) is provided in Annex-G. Other Program Officer will receive 'Training-of Trainers' for implementation of the Environmental Management Framework (EMF) and also on the guidelines for management of microenterprise environmental health and Safety (EHS) risks. The project will support the hiring of the resource persons and training cost for the capacity building. In addition, few officers will receive professional training on integrating environmental concerns and climate change issues on project planning, sustainable development, monitoring of the environmental performance etc.

133. The project will have also budgetary provision for review and further updating of the guidelines for management of microenterprise environmental health and Safety (EHS) risks in the 3rd year of project implementation.

9.3 Capacity Development at PIP

134. The PIP capacities on implementing the EMF in most of the cases are very limited. They have not familiar with the safeguard policies of the World Bank. The project will fund orientation and training program for the PIPs to develop their capacities on environmental management. For the short-listed PIPs, PKSf will organize orientation on how to apply prepare and submit the Sub-Grant Proposal. The relevant orientation section will explain about the initial environmental examination (IEE) and expected documentation. PKSf will also organize training program on environmental supervision and reporting.

9.4 Capacity Development at Community

135. The ultimate target of the project is to improve the climate resilience of the community. It is suggested that the PIPs will allocate a certain portion of the project budget for developing the capacity of the community for better cope up with the climate change risk. It will include integration of the climate concerns and environmental issues in the community level sub-project planning, implementation and supervision.

10.0 Consultation and Disclosure

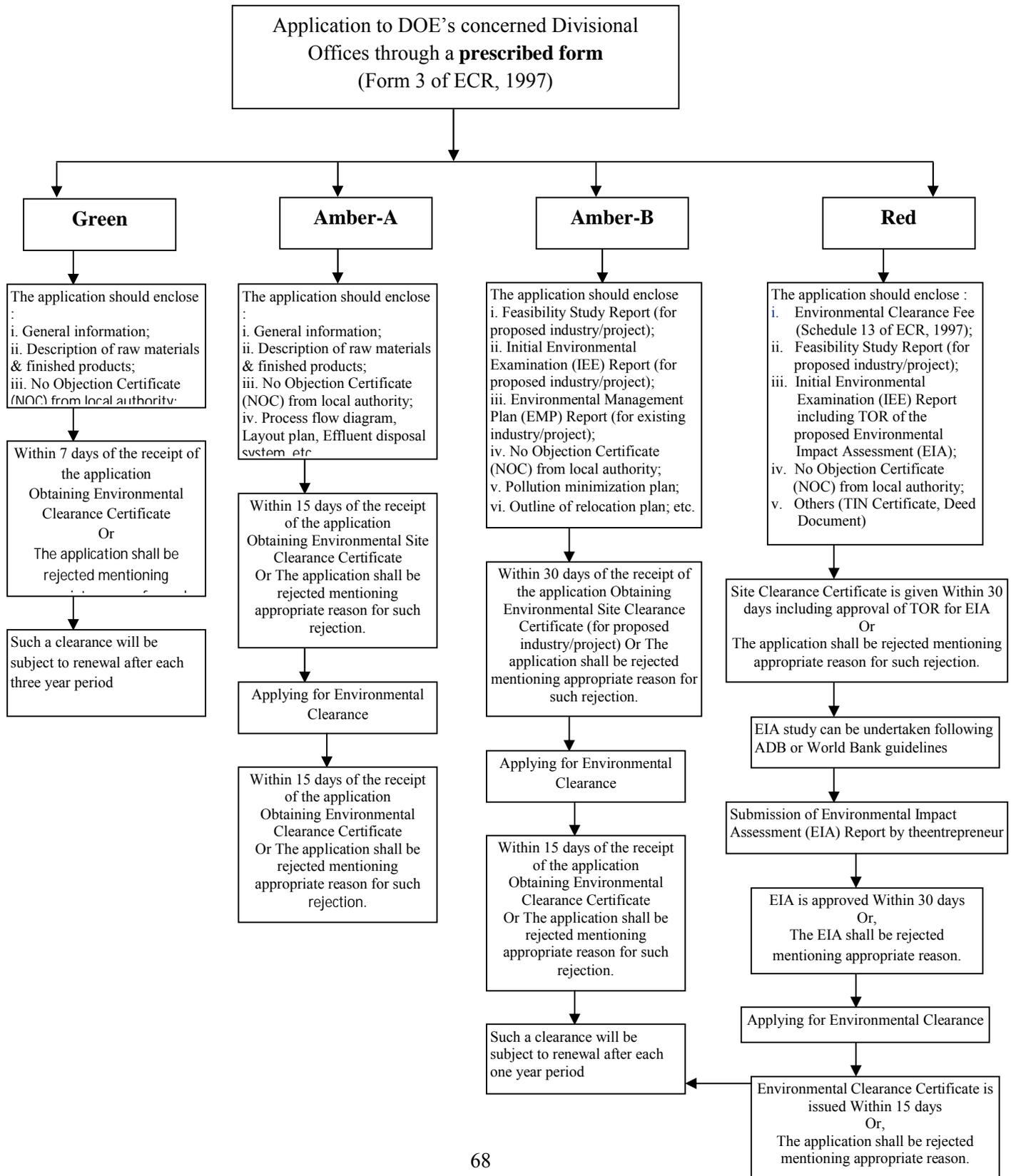
10.1 Consultation

136. PKSf has prepared the EMF in consultation with some potential PIPs. In addition, field visit were made to understand the PKSf on-going programs and environmental concerns of the community. Since the subprojects are yet to be identified, it was not possible to consult with the project beneficiaries or affected persons. The adverse environmental impacts and benefits need to be shared and discussed with the community in preparing the screening formats, initial environmental examination and environmental management plan. The supervision and monitoring also includes consultation with community. The PIPs will document the consultation with community with the proposal package and subsequent monitoring report.

10.2 Disclosure

137. PKSf will follow the disclosure requirement of the World Bank on environmental documentation. After the clearance from the World Bank, the draft final version of the EMF will be posted in the website of PKSf along with a Bangla summary version and will be kept in the offices for further comments and inputs from non-governmental organization, civil society and general public. Newspaper advertisement will be published in two national dailies (English and Bangla) about the disclosure and request for comments on EMF. It will be disclosed in English by World Bank and it will also be made available at the World Bank's Info Shop. The EMF will be finalized taking into consideration of the comments received on draft version and will be available in PKSf and CCCP websites. The PIPs have to make the hardcopy available at their head and local offices. PIP will also upload the final version of the EMF along with the Bangla Summary in their website, if available.

Annex-A: Environmental Clearance Procedure



Annex B: Environmental Setting in terms of Agro-Ecological Zones of Bangladesh

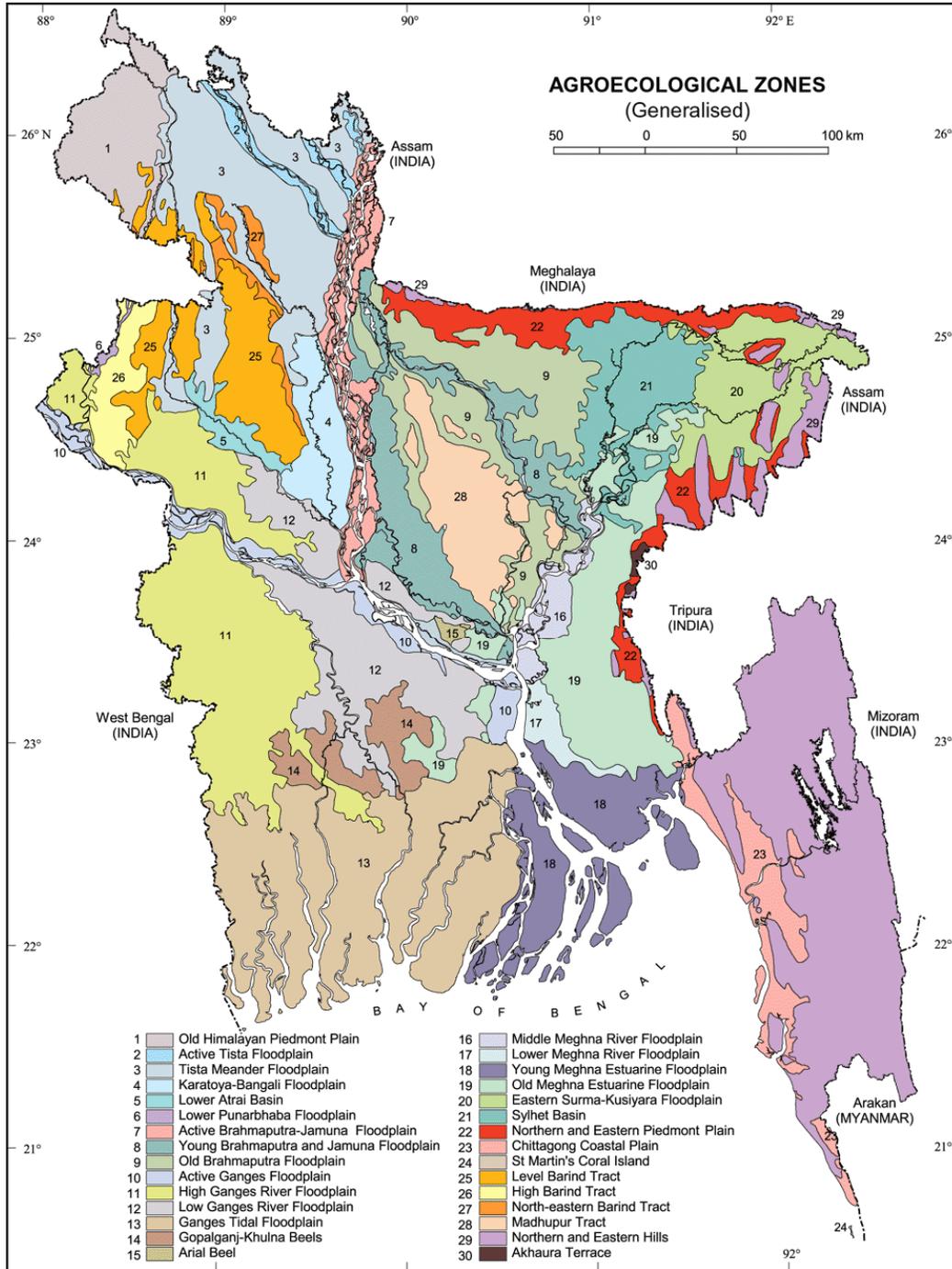


Figure B.1: Agro-ecological Zones of Bangladesh

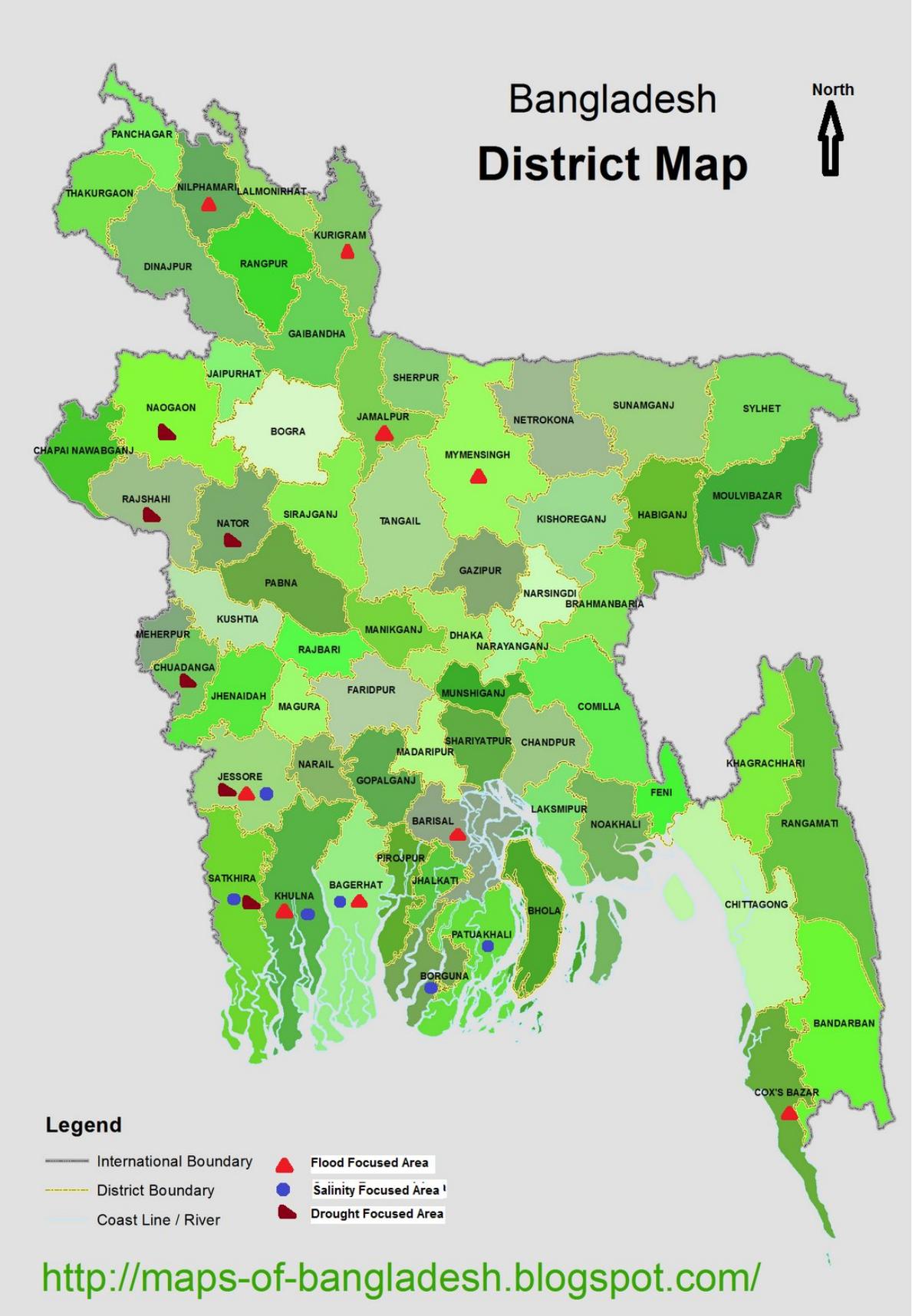


Figure B.2: Bangladesh Map Showing Priority Districts for the Project

Annex-C: List of Negative Subproject Attributes (Shared with NGO at Proposal stage)

In general, the Project will not support any subproject which may have significant environmental impacts and requires full environmental screening. However, this can be considered by the PKSF and the World Bank on special consideration for the significant other benefit of the community. No projects activities will be carried out in disputed lands or lands restricted for development or Environmentally Sensitive areas. Specific subprojects with any of the attributes listed below will be ineligible for support under the proposed operations.

- **Roads**

Construction, reconstruction and extension of regional, national road and highway

Construction/reconstruction of road involving major concrete/cement concrete/reinforced cement concrete/ concrete block

- **Natural Resource Management**

Activities supporting commercial logging in forested areas

Activities involving the use of unsustainably harvested timber or fuel-wood

Activities involving significant conversion or degradation of critical natural habitats

- **Organic Fertilizer Production for Agriculture Application**

Requiring pesticides that fall in WHO classes IA, IB, or II

- **Extensive Shrimp Farming**

Sub-projects involving threats to mangrove forest and coastal environment

- **Dams/Embankment**

Construction/reconstruction of dam/embankment involving major concrete/cement concrete/reinforced cement concrete /concrete blocks.

- **Water Supply**

Tube-wells with Arsenic contamination higher than national standard (i.e., currently 50ppb) or base below the 10-year flood level

Water supply schemes with high probability of bacterial contamination or characteristics which may make water unsuitable for drinking

- **Waste Management**

New or significant expansion of disposal facilities with negative health impacts to nearby water sources or population

New or significant expansion of disposal sites requiring involuntary public participation

- **Drain/canal/pond**

Construction/reconstruction of drain, canal/pond excavation with major loss of agriculture land

Use of concrete cement/ reinforced concrete cement

- **Land filling**

Sub-projects that will impact major destruction of top soil of agricultural land.

Land filling by industrial, household and commercial waste

Annex D: Environmental Screening Format (Completed by the NGOs with the Proposal)

District:

Upazilla:

Union:

Village:

Type of Subproject:

Major Activities under the Subproject:

Screening Questions	Yes	No	Scale of Impact			Remarks
			High	Medium	Low	
A. Subproject Siting						
Is the sub-project area adjacent to or within any of the following environmentally sensitive areas?						
▪ Sunderban, Cox's Bazar-Tekhnaf Sea Shore, Saint Martin Island, Sonadia Island, Hakaluki Haor, Yanguar Haor, Marzat Baor	<input type="checkbox"/>					
▪ Wetland like river, pond, sea, canal	<input type="checkbox"/>					
B. Potential Environmental Impacts						
Will the sub-project cause.....						
▪ loss of top soil?	<input type="checkbox"/>					
▪ loss of agricultural land?	<input type="checkbox"/>					
▪ negative effects on rare (vulnerable), threatened or endangered species of flora or fauna or their habitat?	<input type="checkbox"/>					
▪ negative effects on designated wetlands?	<input type="checkbox"/>					
▪ negative effects on locally important or valued ecosystems or vegetations?	<input type="checkbox"/>					
▪ destruction of trees and vegetation?	<input type="checkbox"/>					

<i>Screening Questions</i>	<i>Yes</i>	<i>No</i>	<i>Scale of Impact</i>			<i>Remarks</i>
			<i>High</i>	<i>Medium</i>	<i>Low</i>	
▪ impact on fish migration and navigation?	<input type="checkbox"/>					
▪ obstruction of natural connection between river and wetlands inside project area?	<input type="checkbox"/>					
▪ water logging in polder areas?	<input type="checkbox"/>					
▪ insufficient drainage leading to salinity intrusion?	<input type="checkbox"/>					
▪ negative effects on surface water quality, quantities or flow?	<input type="checkbox"/>					
▪ negative effects on groundwater quality, quantity or movement?	<input type="checkbox"/>					
▪ increased soil erosion and /or sedimentation?	<input type="checkbox"/>					
▪ negative impact on soil stability and compactness?	<input type="checkbox"/>					
▪ increased noise due to day-to-day construction activities?	<input type="checkbox"/>					
▪ increased wind-blown dust from material (e.g. fine aggregate) storage areas?	<input type="checkbox"/>					
▪ health risks to labors involved in activities?	<input type="checkbox"/>					

Note: Please add any other screening questions relevant to the demonstration. Also provide additional comments and/or positive impacts in 'remarks' column.

Recommendations:

Filled and signed by PIP representative/Community:

Name: _____

Title: _____

Date: _____

Reviewed and signed by NGO Environmental Specialist:

Name: _____

Title: _____

Date: _____

Annex-E: Standard Mitigation Measures

The list has been prepared based on the experience from World Bank funded community development projects like Social Investment Program Project and Employment Generation for the pro Poor Project.

Canal Excavation/Re-excavation

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Earthworks (Excavation, Vegetation Clearance)	<ul style="list-style-type: none"> • Increase in fugitive dust levels and felling of trees 	<ul style="list-style-type: none"> • In residential areas, if works are conducted in the dry season, wet the exposed areas and stockpiles of earth materials, particularly fines, to minimize windborne particles and increase in levels of fugitive dust. • Compensate for trees removed by planting new trees. • Communities must be given at least two weeks prior notice of intended excavation period. • Communities must be given prior notice of intended road closures and designated detours. • For worker health and safety, all workers should be supplied with dust masks. • Cover canal sides with stones (riprap), or use vegetation cover.

Earthen Dam Construction/Re-construction

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Excavation and fill	<ul style="list-style-type: none"> • Blocked access & disruptions • Landslides & slips, erosion and sedimentation 	<ul style="list-style-type: none"> • Give early notice to residents, use signs and flagmen, use diversion or open access periodically. • Keep angle of slopes within limits of soil type. • Use appropriate slope stabilization measures. • Balance cut and fills to limit steepness of slopes. • Cover slopes and re-vegetate early, including shoulders.
Use of construction material	<ul style="list-style-type: none"> • Spillage of the material (mud, sand, etc.) • Improper disposal of construction material 	<ul style="list-style-type: none"> • Cover the stockpiles of fine materials in construction yard to avoid spillage • Proper disposal of construction material
Construction work	<ul style="list-style-type: none"> • Dust generation during construction phase. • Loss of Top soil from farm land by excavation of top soil for fill materials • Water logging problems may occur • Removal of trees 	<ul style="list-style-type: none"> • Regular water should be sprayed during construction of embankment and over newly constructed dry embankment. • Construction should be avoided during rainy season • Immediate compaction after embankment and cleaning after construction of base course • Top soil from farm land should not be used as fill materials for earthworks • Use of bottom part of soil for soil filling keeping the top soil beside and restore the top soil after construction to the agricultural land • Maintain cross-drainage at all times during construction • Removal of trees should be minimal and compensate for trees removed by planting new trees.
Occupational Health and safety	<ul style="list-style-type: none"> • Accident at the construction sites. • Conflict may arise between local & migrant workers 	<ul style="list-style-type: none"> • First Aid Box should be provided to workers/project personal. • Engage local workers instead of migrant workers and to be provided.

Rural Road Construction/Re-construction

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Survey and Fixing Alignment	<ul style="list-style-type: none"> • Tree cutting 	<ul style="list-style-type: none"> • Alignment should be fixed such a way that minimum number of tree cutting occurs
Land Acquisition	<ul style="list-style-type: none"> • Loss of agricultural land, forest, wetlands 	<ul style="list-style-type: none"> • Alignment should be fixed such a way that minimum loss of agricultural land, forest, wetlands • Alternative Alignment can be considered
Use of construction material	<ul style="list-style-type: none"> • Spillage of the material (mud, sand, etc.) • Improper disposal of construction material 	<ul style="list-style-type: none"> • Cover the stockpiles of fine materials in construction yard to avoid spillage • Proper disposal of construction material
Construction work	<ul style="list-style-type: none"> • Loss of Top soil from farm land by excavation of top soil for fill materials • Water logging problems may occur • Removal of trees 	<ul style="list-style-type: none"> • Top soil from farm land should not be used as fill materials for earthworks • Use of bottom part of soil for soil filling keeping the top soil beside and restore the top soil after construction to the agricultural land • Maintain cross-drainage at all times during construction • Removal of trees should be minimal and compensate for trees removed by planting new trees.
Occupational Health and safety	<ul style="list-style-type: none"> • Accident at the construction sites. • Conflict may arise between local & migrant workers 	<ul style="list-style-type: none"> • First Aid Box should be provided to workers/project personal. • Engage local workers instead of migrant workers and to be provided
Use of road	<ul style="list-style-type: none"> • Dust during dry season mud • Erosion of slope • Inconvenience in movement during rain • Water logging • Impact on fish migration due to lack of cross drainage 	<ul style="list-style-type: none"> • Use of water to control dust • Tree plantation • Considering natural drainage pattern, proper planning and design should be done to avoid water logging • Cross drainage should be appropriate in number and location

Water Pipeline Construction

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Survey and Fixing Alignment	<ul style="list-style-type: none"> • Tree cutting 	<ul style="list-style-type: none"> • Alignment should be fixed such a way that minimum number of tree cutting occurs
Land Acquisition	<ul style="list-style-type: none"> • Loss of agricultural land, forest, wetlands 	<ul style="list-style-type: none"> • Alignment should be fixed such a way that minimum loss of agricultural land, forest, wetlands • Alternative Alignment can be considered
Use of construction material	<ul style="list-style-type: none"> • Spillage of the material (mud, sand, etc.) • Improper disposal of construction material 	<ul style="list-style-type: none"> • Cover the stockpiles of fine materials in construction yard to avoid spillage • Proper disposal of construction material
Construction work	<ul style="list-style-type: none"> • Loss of Top soil from farm land by excavation of top soil for fill materials • Water logging problems may occur • Removal of trees • Interfere with existing underground utilities (water and gas pipelines, and communication and power cables) 	<ul style="list-style-type: none"> • Top soil from farm land should not be used as fill materials for earthworks • Use of bottom part of soil for soil filling keeping the top soil beside and restore the top soil after construction to the agricultural land • Maintain cross-drainage at all times during construction • Removal of trees should be minimal and compensate for trees removed by planting new trees. • People should be informed before commencement of the work. • Emergency supply can be placed to minimize the impact.
Occupational Health and safety	<ul style="list-style-type: none"> • Accident at the construction sites. • Conflict may arise between local & migrant workers 	<ul style="list-style-type: none"> • First Aid Box should be provided to workers/project personal. • Engage local workers instead of migrant workers and to be provided
Repair and replacement activities when there are leaks or breaks on pipelines	<ul style="list-style-type: none"> • Interruption of water supply 	<ul style="list-style-type: none"> • A program should be established to detect leaks and replace old pipelines to minimize the risk of water supply interruption. • Water quality should be checked annually.

Drain Excavation/Re-excavation

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Earthworks (Excavation, Vegetation Clearance)	<ul style="list-style-type: none"> • Increase in fugitive dust levels and felling of trees. • Contamination or siltation from dredged/excavated material • Flooding from inadequate or blocked drains • Erosion of drain and siltation 	<ul style="list-style-type: none"> • In residential areas, if works are conducted in the dry season, wet the exposed areas and stockpiles of earth materials, particularly fines, to minimize windborne particles and increase in levels of fugitive dust. • Compensate for trees removed by planting new trees. • Communities must be given at least two weeks prior notice of intended excavation period. • Communities must be given prior notice of intended road closures and designated detours. • For worker health and safety, all workers should be supplied with dust masks. • Use good design; do not block drains, clear blocked drains. • Cover drain sides with stones (riprap), or use vegetation cover.

Land filling

(Community Institutions like school, graveyard, prayer ground)

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Earthworks (Filling, Vegetation Clearance)	<ul style="list-style-type: none"> • Increase in fugitive dust levels and felling of trees 	<ul style="list-style-type: none"> • In residential areas, if works are conducted in the dry season, wet the exposed areas and stockpiles of earth materials, particularly fines, to minimize windborne particles and increase in levels of fugitive dust. • Compensate for trees removed by planting new trees. • Communities must be given at least two weeks prior notice of intended excavation period. • Communities must be given prior notice of intended road closures and designated detours. • For worker health and safety, all workers should be supplied with dust masks.
Use of construction material	<ul style="list-style-type: none"> • Spillage of the material 	<ul style="list-style-type: none"> • Cover the stockpiles of fine materials in construction yard • Ensure proper disposal of construction material
Construction work	<ul style="list-style-type: none"> • Loss of Top soil from farm land by excavation of top soil for fill materials • Water logging problems may occur 	<ul style="list-style-type: none"> • Top soil from farm land should not be used as fill materials for earthworks • Use of bottom part of soil for soil filling keeping the top soil beside and restore the top soil after construction to the agricultural land • Maintain cross-drainage at all times during construction

Earthen Shelter for Animals

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Land Acquisition	<ul style="list-style-type: none"> • Loss of agricultural land, forest, wetlands 	<ul style="list-style-type: none"> • Location should be fixed such a way that minimum loss of agricultural land, forest, wetlands • Alternative location can be considered
Earthworks	<ul style="list-style-type: none"> • Increase in fugitive dust levels and feeling of trees 	<ul style="list-style-type: none"> • In residential areas, if works are conducted in the dry season, wet the exposed areas and stockpiles of earth materials, particularly fines, to minimize windborne particles and increase in levels of fugitive dust. • Compensate for trees removed by planting new trees. • Communities must be given at least two weeks prior notice of intended construction period. • Communities must be given prior notice of intended road closures and designated detours. • For worker health and safety, all workers should be supplied with dust masks.
Usage of the shelter	<ul style="list-style-type: none"> • Animal wastes generation • Odor nuisance 	<ul style="list-style-type: none"> • Sell uncontaminated wastes to farmers as fertilizer • Avoid dumping solid waste • Do not let sludge stagnate in or around community

Excavation of Public Ponds/Fish Farms

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Survey and Fixing Alignment	<ul style="list-style-type: none"> • Tree cutting 	<ul style="list-style-type: none"> • Pond location should be selected which will cause minimum trees to be cut
Land Acquisition	<ul style="list-style-type: none"> • Loss of agricultural land, forest, wetlands 	<ul style="list-style-type: none"> • Pond location should be fixed such a way that minimum loss of agricultural land and wetlands • Alternative location can be considered
Construction work	<ul style="list-style-type: none"> • Dust generation during • Removal of trees • Use of dechlorinator 	<ul style="list-style-type: none"> • Regular water should be sprayed during earthworks. • Excavation should be avoided during rainy season • Removal of trees should be minimal • Restrict the water from drinking
Use of construction material	Improper disposal of excavated material	<ul style="list-style-type: none"> • Proper disposal of excavated material
Occupational Health and safety	<ul style="list-style-type: none"> • Accident at the construction sites. 	<ul style="list-style-type: none"> • First Aid Box should be provided to workers/project personal. • Engage local workers instead of migrant workers and to be provided
Usage of pond	<ul style="list-style-type: none"> • Erosion of slope • Eutrophication 	<ul style="list-style-type: none"> • Tree plantation along the pond side • Plantation grass on the slope • Proper maintenance to take out extra hyacinth

Organic Fertilizer Production

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Production of Organic Fertilizer	<ul style="list-style-type: none"> • Odor • Surface water pollution and Eutrophication • Pest problem 	<ul style="list-style-type: none"> • Improperly-processed organic fertilizers may contain pathogens from plant or animal matter that are harmful to humans or plants. Fertilizer should be prepared according to the manual. • Avoid excessive use of nitrogen nutrient. • Ensure proper disposal of the wastes
Uses of Organic fertilizer	<ul style="list-style-type: none"> • Possible pollution of surface water or groundwater. • Contamination of surrounding area. 	<ul style="list-style-type: none"> • Dispose of collected waste materials at approved landfill or disposal site. • Only use approved standard processes and equipment, and maintain it in good working order.

Water Reservoir Construction

Project Activity	Potential Environmental Impact	Proposed Mitigation (incl. Legislation and Regulation)
Earthwork	<ul style="list-style-type: none"> • Increase in fugitive dust levels; • Hindrance of pedestrian movement; • Waste/debris, and creation of stagnant pools. 	<ul style="list-style-type: none"> • Excavation must be made (if possible) during the dry season, to avoid erosion and siltation of drainage canals or other water bodies in the area; • Use silt screens and sediment traps to prevent sediment from reaching trenches and watercourses. • Provide adequate drainage interception and diversion around trenches and work site. • 4. Ensure prompt refilling of reservoir and proper management and use/disposal of soil cover and wastes.

Annex-F: Sample Review Format by PKSF

Table 1: Finalization of PIP

Serial #	Sub Project Title	Location	Proposed Activities	Screening Format Submission y/N	Identified Environmental Concern	Community Consultation Y/N	Submission of Mitigation Measure Y/N	Submission of EMP Y/N	IEE Requirement Y/N	If IEE yes, submitted IEE	Costing for Environmental issue	Environmental Focal Point Y/N	Recommendation

Annex-G: Job Description of Program Officer (Environment and Natural Resource Management) at PKSF

The Program Officer (Environment), preferably with the post-graduation specialization in environmental engineering /environmental science relevant field, shall have at least 10 years of working experience related to preparation of EA, integration of environmental and social issues in the design, implementation and operation of rural infrastructure projects. Experience in community driven projects is preferred.

The specific roles and responsibilities of the Program Officer (Environment and Natural Resource Management) shall include, but not limited to the following:

- Lead the environmental safeguard related activities in the project
- Design and implement capacity development initiative in CCCP
- Develop, organize and deliver environmental training and orientation programs and workshops for the staff of the PKSF and PIPs
- Review categorization for each sub-project and recommend for further steps based on environmental screening
- Take part in the project document review process and assess the initial environmental examination (IEE) and environmental management plan (EMP) if any, attached to the project paper submitted by the PIPs
- Review and recommend site specific initial environmental examination (IEE) and environmental enhancement/mitigation designs proposed by PIPs
- Carry out regular field visit to assess the quality and adequacy of screening, IEE, EMP and also supervision of environmental activities
- Hold regular meeting with project management in PKSF, Project Monitoring Officers of PKSF and PIPs
- Prepare and submit regular environmental monitoring and implementation progress reports
- Prepare good practice dissemination notes based on the experience gained from site supervision
- Working with PKSF management to strengthen its environmental capacity and mainstream integration of environmental consideration in project planning, implementation and operation
- Review the PKSF's guidelines for management of microenterprise environmental health and Safety (EHS) risks
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Annex H: Scope of Work of Environment Specialist under Independent Assessment/Third Party Monitoring

Scope of Work

- ✓ Develop a systematic approach to identify the representative sample size considering the types of subprojects;
- ✓ Review the adequacy of the environmental screening, environmental management plan and implementation of the environmental mitigation activities;
- ✓ Assess the institutional mechanism for integration, management and monitoring of environmental issues in subproject planning, implementation and operation & maintenance (O&M);
- ✓ Examine the knowledge and awareness of the field level staffs on management of environmental issues;
- ✓ Recommend specific suggestions to improve the environmental management of the subproject design, implementation and O&M in next year; and
- ✓ In order to carry out the above tasks, the consultant will review the list of the subprojects, identify category subprojects, conduct FGD and interviews of the beneficiaries, other local community people, NGOs and field level staffs.

Qualification of Environmental Specialist

- At least Masters Degree or four years honors degree in environmental studies/management/science/engineering/agriculture
- About 10 years of experience in environmental assessment
- Experience in community-driven development approach
- Ability to lead, organize and co-ordinate
- Good verbal and written communication skills in both English and Bangla
- Demonstrated interpersonal skills, and proven ability to work in a different multicultural context