

FINAL

Private Sector Development Support Project

**ENVIRONMENTAL MANAGEMENT
FRAMEWORK**

**EMF
FOR
PSDSP & AF**

DECEMBER, 2010
(Updated in October, 2015)

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ABBREVIATIONS

BCC	Bangladesh Computer Council
BECA	Bangladesh Environment Conservation Act
BEPZA	Bangladesh Export Processing Zones Authority
BEZA	Bangladesh Economic Zones Authority
BICF	Bangladesh Investment Climate Fund
BoI	Board of Investments
CCU	Central Coordinating Unit
CETP	Common Effluent Treatment Plant
DOE	Department of Environment
EA	Environmental Assessment
ECA	Environment Conservation Act, 1995
ECC	Environmental Clearance Certificate
ECR	Environment Conservation Rules, 1997
EIA	Environmental Impact Assessment
EMC	Environment Management Cell
EMP	Environmental Management Plan
EMU	Environment Management Unit
EMF	Environmental Management Framework
EPZ	Export Processing Zone
ERD	Economic Relations Division
EZ	Economic Zone
GDP	Gross Domestic Product
GOB	Government of Bangladesh
HTPA	Hi-Tech Park Authority
ICA	Investment Climate Assessment
ICT	Information and Communication Technology
IEE	Initial Environmental Examination
MOEF	Ministry of Environment & Forest
MOSICT	Ministry of Science, Information and Communication Technology
NEMAP	National Environmental Management Action plan
OP	Operational Policies
PAD	Project Appraisal Document
PEC	Project Environment Cell
PIU	Project Implementation Unit
PMO	Prime Minister's Office
PMU	Project Management Unit
PSDSP	Private Sector Development Support Project

RMG	Ready Made Garments
SCC	Site Clearance Certificate
SIA	Social Impact Assessment
SME	Small and Medium Enterprises
WARPO	Water Resources Planning Organization
WB	World Bank

1 THE EMF DOCUMENT

1.1 OVERVIEW OF EMF

1. Private Sector Development Support Project (PSDSP) involves facilitating the development of Economic Zones (EZ) and Export Processing Zones (EPZ) in Bangladesh, through financial assistance from The World Bank. Depending on the nature and type of zone, the sub-projects can lead to environmental impacts during project development and operation phases by way of use of construction materials for building infrastructure and related earth moving activities; generation of industrial and domestic wastewater, and solid waste from operations and other industrial emissions. Compliance with the national and World Bank safeguard policies and conducting EA for various sub-projects of PSDSP will help ensure implementation of environmental mitigation measures that can eliminate or reduce adverse impacts of the development activities and industrial operations to a minimum level. Furthermore, cleaner production and pollution prevention knowledge and technologies can be used at various stages of the project to reduce the environmental risks of PSDSP.
2. The Environmental Management Framework (EMF) provides the systems, procedures and institutional arrangements of PSDSP, that ensure compliance to the environmental regulations of GoB and the safeguard policies of The World Bank. In light of the proposed additional financing for PSDSP, the EMF has been updated based on the experience gained during the implementation of PSDSP project, to help better implementation of environment management measures for the activities being supported through the additional financing of the project (PSDSP II).

1.2 STRUCTURE OF THE DOCUMENT

3. The EMF has been organized in the following six chapters.
 - Chapter One, provides an overview of EMF including its purpose, target users and the environmental assessment process for PSDSP;
 - Chapter Two presents a brief background of the PSDSP (I & II) including its objective, nature, components and the project cycle;
 - Chapter three provides the legal and institutional basis for establishing the EMF for PSDSP. The chapter also includes an analysis of World Bank safeguard policies and the regulations of Government of Bangladesh (GoB);

- Chapter Four details out environmental management procedures for PSDSP;
- Chapter Five provides the monitoring and reporting framework for EMF, including responsibilities, institutional arrangements; and
- Chapter Six discusses the capacity building and training requirements for implementing the EMF.

1.3 METHODOLOGY

4. The following steps were followed for preparing and updating the EMF for PSDSP.
 - Review of environmental policies of GoB and The World Bank;
 - Review of environmental issues associated with EZ / EPZs in Bangladesh;
 - Experience of implementing environmental framework in ongoing PSDSP and similar projects in Bangladesh such as Bangladesh Investment Climate Fund (BICF) and the Bank funded Investment Promotion and Financing Facility (IPFF) Project;
 - Review of relevant information on environmental management in EZ / EPZs; and
 - Consultations with the stakeholders

These steps are detailed out in figure 1 below.

1.4 PURPOSE OF EMF

5. The Environment Management Framework (EMF) details out the agreed policies, guidelines, and procedures to be integrated into the implementation of PSDSP. The main purpose of the EMF is to:
 - Understand the process of addressing environmental concerns in PSDSP projects, which are a combination of Public and Private financed projects;
 - To establish clear procedures and methodologies for the environmental assessment, review, approval and implementation of investments to be financed under the project;
 - To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental concerns related to project investments;
 - To determine the training, capacity building and technical assistance needed

to successfully implement the provisions of the EMF;

- To provide practical information, and resources for implementing the EMF.

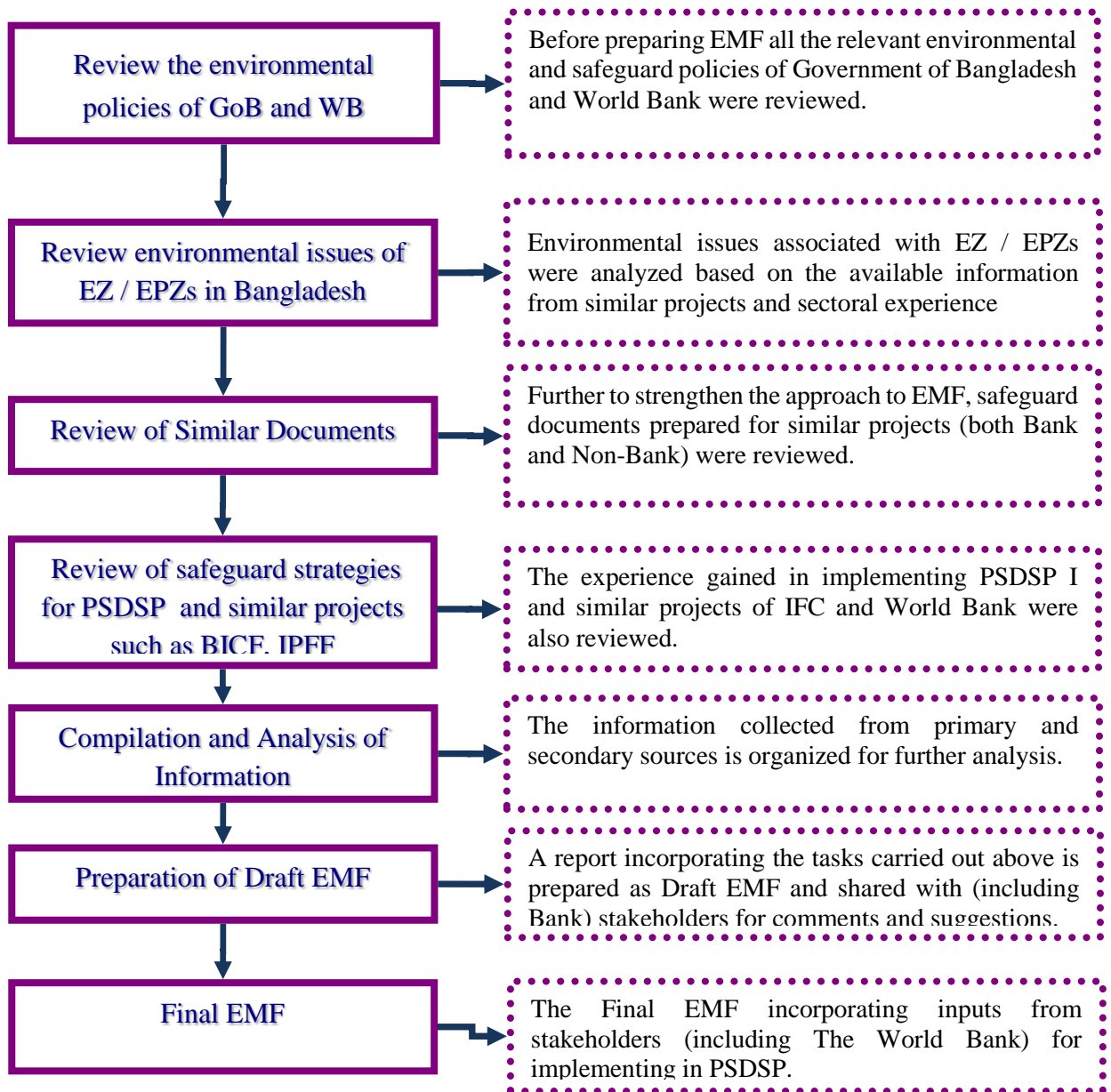


Figure 1: Methodology of Preparing EMF for PSDSP

6. As a guide on principles and procedures for addressing environmental management aspects of various sub-projects of PSDSP, the EMF is a useful reference to project implementing agencies, private developers, the industrial units and other stakeholders of the project.

1.5 USERS OF EMF

7. As an important policy and procedural document for the PSDSP sub-projects, the EMF is designed for use by the following agencies.
 - ***PSDSP Project Staff at the Central Coordinating Unit (CCU at ERD)***: To ensure that projects are adequately assessed and are compliant with all environmental requirements of GoB and PSDSP I & II.
 - ***Project Implementing Agencies (BEZA/BEPZA/ HTPA)***: As a document that spells out requirements with respect to environmental issues that need to be met, under PSDSP I & II.
 - ***Potential Private Master Developers***: As a document that explains the compliance requirements for environmental management for projects being developed under PSDSP I & II.
 - ***Potential Industrial Units / entrepreneurs of the EZs***: As a document that details out the environmental management requirements for the industrial units in the EZs.
 - Other relevant government agencies, including DOE

2 DESCRIPTION OF THE PROJECT

2.1 BACKGROUND OF PSDSP PROJECT

8. Bangladesh has enjoyed rapid economic growth for more than two decades. In 2000-2014, Bangladesh's gross domestic product (GDP) grew on average by 5.7 percent per year.¹ GDP per capita at purchasing power parity (PPP) increased by 81 percent over the same time period and reached US\$2,981 in 2014.² The positive economic growth record has been translated into a steady decline in extreme poverty. The proportion of the population that lived on US\$1.25 or less a day (PPP) dropped from 70 percent in 1991, to 59 percent in 2000, and to 43 percent in 2010—the last year with comparable data. In 2014, Bangladesh officially migrated from low-income to lower middle-income status.
9. Notwithstanding Bangladesh's impressive economic performance, the country remains one of Asia's poorest countries. An estimated 47 million people still live below the poverty line and many Bangladeshis would fall back into poverty if they lost their jobs or were affected by natural disasters. In 2010, the official unemployment rate was 5 percent and underemployment affected more than a fifth of the workforce.³ With 1.7 million people joining the workforce every year and nine out of ten workers operating in the informal sector, the creation of more, better and more inclusive jobs is a top priority for the government.
10. The Bangladeshi economy has never been as open to international commerce as it is today. Exports of goods and services reached US\$33 billion in 2014 and have more than tripled as a share of GDP (to 20 percent) since market liberalization reforms were implemented in the early 1990s. Bangladesh has become a major supplier of readymade garments (RMG) to international markets. The country's record of attracting foreign direct investment (FDI), however, is disappointing. In the last decade, annual net inflows of FDI were an average 1.0 percent of GDP. Foreign investors—as well as local firms—face a severe shortage of accessible land and electricity supply, an inadequately trained workforce, and a highly corrupt administration.

¹ World Bank World Development Indicators, accessed September 25, 2015, cover all data in Paragraph 1.

² Constant 2011 international \$.

³ Saleh, A.Z.M. State of Unemployment and Poverty, Bangladesh Economic Update May 2014, Economic Policy Unit of Unnayan Onneshan.

11. Bangladesh has the world's highest population density (excluding city states) and the population is currently expanding by 2 million inhabitants every year. There is significant migration from rural to urban areas and most of the labor surplus in the agriculture sector has thus far been absorbed by the informal services sector. Firms in the manufacturing sector is facing severe challenges to access land for green field investments. Record high population density coupled with an inadequate road network and large tracts of land inappropriate for industrial use due to frequent flooding has led the GoB to rely on special economic zones (SEZ) for the development of the manufacturing sector. GoB, through the Bangladesh Economic Zone Authority (BEZA), is encouraging the establishment of 100 new SEZs on roughly 30,000 ha of land across the country in the coming 15 years. The objective is to boost exports by US\$40 billion and employment by 10 million. Twenty-two SEZs have recently been approved and there are separate plans to encourage the establishment of high-tech parks. The establishment of SEZs and high-tech parks is considered critical to harness enough land for industrial and service production and to achieve the GoB's poverty alleviation goals.
12. The Sixth Five Year Plan for 2011-15 states that the establishment of SEZs is a cornerstone of the country's strategy for strengthening the manufacturing sector and promoting efficient use of skilled labor, land, infrastructure, energy and other resources.⁴ The SEZ policy is an explicit attempt to address regional disparities, relocating pollution-prone and manufacturing enterprises from metropolitan areas, and attracting a significant inflow of foreign and domestic investment needed to create decent jobs. In addition, the Seventh Five Year Plan for 2016-20, which is currently under preparation, will continue to stress the importance of SEZ development to crowd in private investment in productive sectors.⁵ The country's RMG sector is largely hosted in and around eight export processing zones (EPZs) controlled by the Bangladesh Export Processing Zone Authority (BEPZA). These zones have little spare capacity to host new factories despite the high demand for space within the zones. Government policy states that BEZA will replace BEPZA in its role of providing new serviced land for the manufacturing sector.
13. In order to tackle some of the above issues, the Private Sector Development Support

⁴ Sixth Five Year Plan FY2011-FY2015, Part 2, page 69 and 74.

⁵ www.plancomm.gov.bd/7th-five-year-plan/

Project (PSDSP) was developed to support the development of a few pilot projects incorporating the new EZ model. The PSDSP was aimed at creating the infrastructure platform required to further enhance a manufacturing and services led transformation of Bangladesh's economy. The project is expected to generate firm level investment in manufacturing and services beyond the already established RMG sector. As a result the project will contribute to a sustainable increase in jobs and household income for an increasingly densely populated Bangladesh. The project will build on Bangladesh's experience in the application of export processing zones. It will leverage good practice while learning from experiences in other regions, address key constraints identified in the ICA and various consultations and support firm level innovation.

14. PSDSP-1 became effective in August 2011 and it is scheduled to close in June 2016. It is financed by an IDA Credit of US\$42.8 million and a grant of US\$17.4 million from the UK Department for International Development (DfID).
15. The new, second phase of PSDSP in FY17-21 (PSDSP-2) will build upon the achievements and lessons learned from the first phase of PSDSP in FY12-16 (PSDSP-1) and support the GoB in scaling up support to recently licensed and new zones. The project will address constraints to private investment and job creation by turning secure, government owned and controlled land into serviced industrial land for green-field and expansion projects. The SEZs will be financed and developed largely by private investors that obtain licenses from the Bangladesh Economic Zones Authority (BEZA) and the Bangladesh Hi-Tech Park Authority (BHTPA). The licenses are issued to both private developers and public private partnerships (PPP). The project will finance the preparation of pre-feasibility studies and master plans and transaction advisors who will engage and concession land to private EZ developers. The zones will be developed in accordance with international practices of building safety, environmental and social safeguards.

2.2 OBJECTIVES OF PSDSP

16. The objective of PSDSP I is to increase employment through the facilitation of investment in selected emerging growth centers in the manufacturing and services sectors of the economy. To achieve this objective, the project will finance off-site, and any necessary onsite, infrastructure (public and common infrastructure) in EZs, starting with the Kaliakoir Hi-Tech Park, the expansion of the Comilla EPZ and other sites to be identified (Component Two). The project will build the capacity

of government institutions involved in the development of EZs (BEZA, BEPZA, HTPA .) through TA and targeted capacity building (Component One). Finally, under Component Three, the project will build better linkages between firms within zones and related suppliers by providing training through institutions (public and private) and by supporting firm collaboration in applied research and improved standards. Targeted end-beneficiaries will include firms operating within the zones, their suppliers, and those employed by both (zone firms and suppliers).

17. The PDO for PSDSP II is to “increase private investment and the number of jobs in targeted special economic zones in Bangladesh and promote socially and environmentally responsible growth in the manufacturing and service sectors”.

2.3 COMPONENTS OF PSDSP

2.3.1 PDSP

18. ***Project Objective:*** The objective of the project is to develop environmentally sound zones using public private partnerships. The project consists of financing for public sector investment in infrastructure, the development of serviced land, improving the efficiency of existing zones and leveraging private financing for zone development where found feasible through private participation.

19. **Component 1**

Sub component 1.1: Master Planning, Design, EIAs and SIAs

The project will provide technical assistance to undertake the following:

- i) A full viability study, demand survey, including financial, economic, technical, legal, social and environmental assessments. This will also include some preliminary market testing and feedback;
- ii) Provide transaction advice to develop an Information Memorandum for potential investors and assist in the ‘road show’ and revise the project design based on feedback based on investor response;
- iii) To develop a full procurement plan including documentation for the master developer and to market the project to potential investors;
- iv) Develop the operational guidelines to monitor the performance of the master developer under the concession agreement, and ensure compliance with all other legal and regulatory requirements;
- v) Develop a dispute resolution mechanism to monitor disagreements, changes or other adverse circumstances that might threaten the concession.

20. Sub component 1.2: Improving the business environment

The project will also provide technical assistance and capacity building to reduce the cost of doing business by facilitating major business transactions within zones. The project will include: a) business registration, b) import and export permits and c) customs clearances and assessments. The project will support the review of process and procedures and support the amendment of any rules and legislation required.

21. Sub component 1.3: Improving the capacity of Zones related institutions

The project will provide technical assistance and capacity building crucial to zones related institutions. These will include the Prime Minister's Office (PMO) for approving / adopting/ promulgating regulations related to environmental and social compliance, the Public Private Partnership (PPP) unit in Board of Investment (BoI), the Private EPZ Cell, the Ministry of Science Information and Communication Technology (MoSICT) for developing support policy, coordinating research (applied research with private investors within zones), the Bangladesh Computer Council (BCC) for supporting the development of ICT in Bangladesh, BOI for investment promotion, BEPZA for zones assessment, design performance and contract monitoring, and the DoE for environmental regulatory compliance. The project will support the establishment of a Zones Forum for all institutions to coordinate and share experiences.

22. **Component 2**

The project will provide for investments in developing infrastructure that will not be funded by the private sector. The funding for these infrastructure investments will be provided under this component and referred to as the Public Investment Facility. Following, the "road show" to seek private participation, the "master developer" of the project will clarify the scope of investments that cannot be provided for by the private developer. In principle, the government should focus on investments outside the EZ, though clearly this may not always be the case. These investments may include land preparation costs, land resettlement costs, access to roads, rail connections, water and drainage systems, common user facilities, etc.

23. Preliminary assessment of the amount of funding required from the Public Investment Facility will be provided during the viability study, and will thereafter be refined until the bid process. The eligibility criteria for access to the public investment facility will include: a) site survey and viability assessment, b)

completion of a road show for private participation, (in the case of an expansion of an existing zone this will be waived as for the case in the Comilla EPZ), c) environmental and social assessment, etc. The project will start first with the proposed site at Kaliakoir which the Government wishes to launch as a Hi-Tech or IT park. The component will also provide for supporting private investment in Central Effluent Treatment Plant (CETP) in existing zones following same method.

24. The diagram below indicates the balance between public and private inputs. It shows the Public sector providing basic design for the EZ, providing the land and preparing that land, paying for the land, providing oversight of management and assistance during operation (for example utility access or permitting). However, its objective will be to maximize private investment and management and minimize the public’s scarce resources. This is an example of how this balance might work best, but this assessment will need to be made on a project by project basis.

	Private	Public
Design		
Land prep/Build		
Finance		
Manage		
Operate		

25. **Component 3**

Sub component 3.1: The Training and Applied Research Scheme (TARS)

The TARS is aimed at developing the human resources available to Bangladesh. The main services developed under this scheme are likely to be technical training courses for individuals and private firms, although production assistance, quality certification, and product testing services may also be in demand. The project will provide a grant to registered training institutions for the training of individuals based on an agreed curriculum and time line with a group of firms. This includes technical university departments or research institutions for applied research conducted by private sector firms. Grants to these institutions will be based on; a)

a firm tendering process to provide a specific set of skills, b) agreed curriculum, number of graduates and time line c) access to machinery by the private sector and d) agreed tripartite grant agreement and a minimum cost contribution by the private sector. TARS is crucial to making institutions more independent, more responsive to enterprise needs, and more open to private sector participation in planning and services development. The TARS scheme contains strict provisions aimed at ensuring that only viable projects that will lead to real economic benefits through higher productivity by private firms are funded.

26. Sub component 3.2: Technical Assistance and Grants

This sub component will provide technical assistance and grants to SMEs as suppliers and micro enterprises supplying into the zones or affected by the zones for two main activities: a) technical assistance to firms on social and environmental standards; the project will provide technical assistance to assess firms providing goods and services to zone firms to establish a firm level baseline on social standards and emissions on a voluntary basis; b) to firms that are benchmarked and assessed to implement energy audits and improve social standards; SMEs will be encouraged to achieve prescribed standards or reduction of emissions. Eligibility criteria will be based on the level of standard or reduction in emission, the firm level contribution, the implementation time frame, etc.

2.3.2 Components of PSDSP Additional Financing

27. Building on PSDSP1 achievements—in particular the regulatory regime, institutional set up, licensing and establishment of private EZs and IT Parks in Bangladesh—PSDSP2 will scale up financing for prefeasibility studies, transaction advisory services, work force training, funding for last mile infrastructure, and investment promotion targeting international zone developers and anchor investors/tenants. The support activities are not only expected to increase economic activity and generate more employment opportunities but also promote sustainable growth through improvements in building safety, occupational safety, environmental and labor standards and gender sensitive policies. The project's three components will: (i) strengthen public sector capacity to identify, plan, license and negotiate PPP concessions for EZ development and facilitate private EZ development; (ii) construct last mile offsite infrastructure and shared onsite facilities; and (iii) strengthen demand driven skills formation and encourage and enforce good social and environment practices in private businesses located within,

and within proximity of, the EZs.

14. **Component 1 (US\$15mn): Strengthening the Enabling Environment for EZ Development.** This component will finance operational expenditure, TA, training, capacity building and equipment to: (i) strengthen GoB's in-house capacity for the licensing of EZ; (ii) strengthen capacity to negotiate private and public-private arrangements for EZs, and monitor and enforce concession agreements; (iii) hire and manage third party transaction advisors to streamline the process of development of zones, develop detailed offsite infrastructure designs, supervise construction, design online portal for one stop services, conduct site assessments and pre-feasibility studies—in close cooperation with BEZA and HTPA—and target zone developers/operators and anchor investors that are prime candidates for occupying new and existing EZs; and (iv) build and maintain sufficient project management capacity within the IAs to successfully implement the project and populate M&E frameworks.
15. **Component 2 (US\$120mn): Public Investment Facility for EZ Development.** This component will finance TA, equipment and public works for (i) primarily off-site, last-mile infrastructure (e.g. land preparation and development, access roads, sewerage systems, power distribution lines, water supply lines, buildings and rail landings.); and (ii) shared on-site facilities (e.g. perimeter walls, central effluent treatment, power supply, water purification, access roads) required to crowd in private investment for EZ development. The Public Investment Facility will promote the development of EZs licensed by BEZA and HTPA.
16. **Component 3 (US\$9mn): Strengthening Skills Formation, Building Safety, and Sustainable Social and Environmental Standards.** This component will finance technical assistance, training, capacity building and equipment to: (i) encourage and enforce internationally recognized building codes and standards partially through formal mechanisms imposed within EZs; (ii) facilitate the adoption of good social and environmental practices within sectors/tenants based in EZ/EPZs and in their proximity; (iii) encourage and promote gender sensitive support programs and corporate policies; (iv) improve the entrepreneurial, managerial, technical and IT skills of the workforce; and (v) support compliance with international quality and environmental standards.

2.4 SUB-PROJECTS OF PSDSP I & ADDITIONAL FINANCING

28. The project will support the planning, project structuring, bid process management

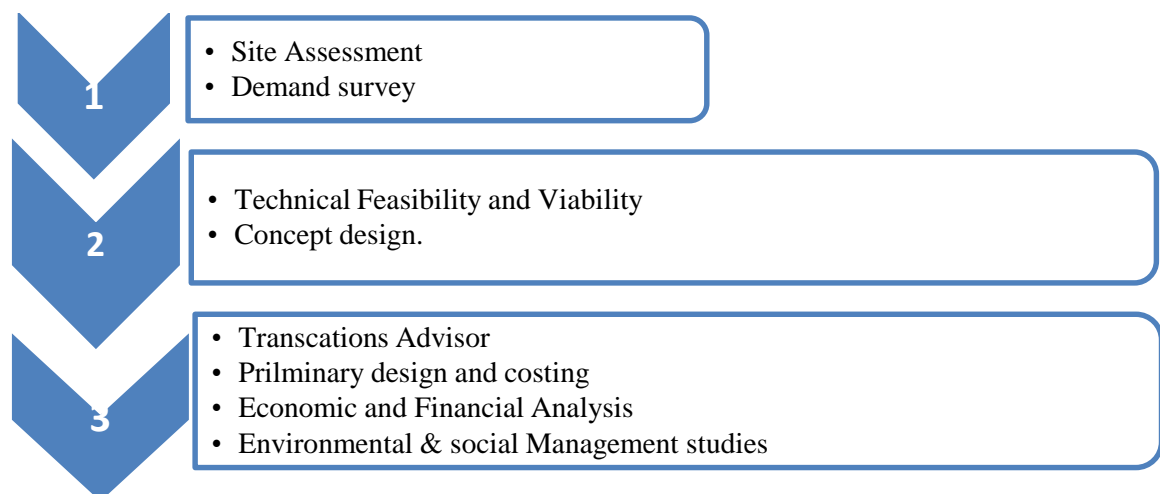
for appointing private master developers and public financing components of EZ / EPZs to be developed by BEZA / HTPA and BEPZA . The typical projects that are expected to be supported through the project would hence include the following.

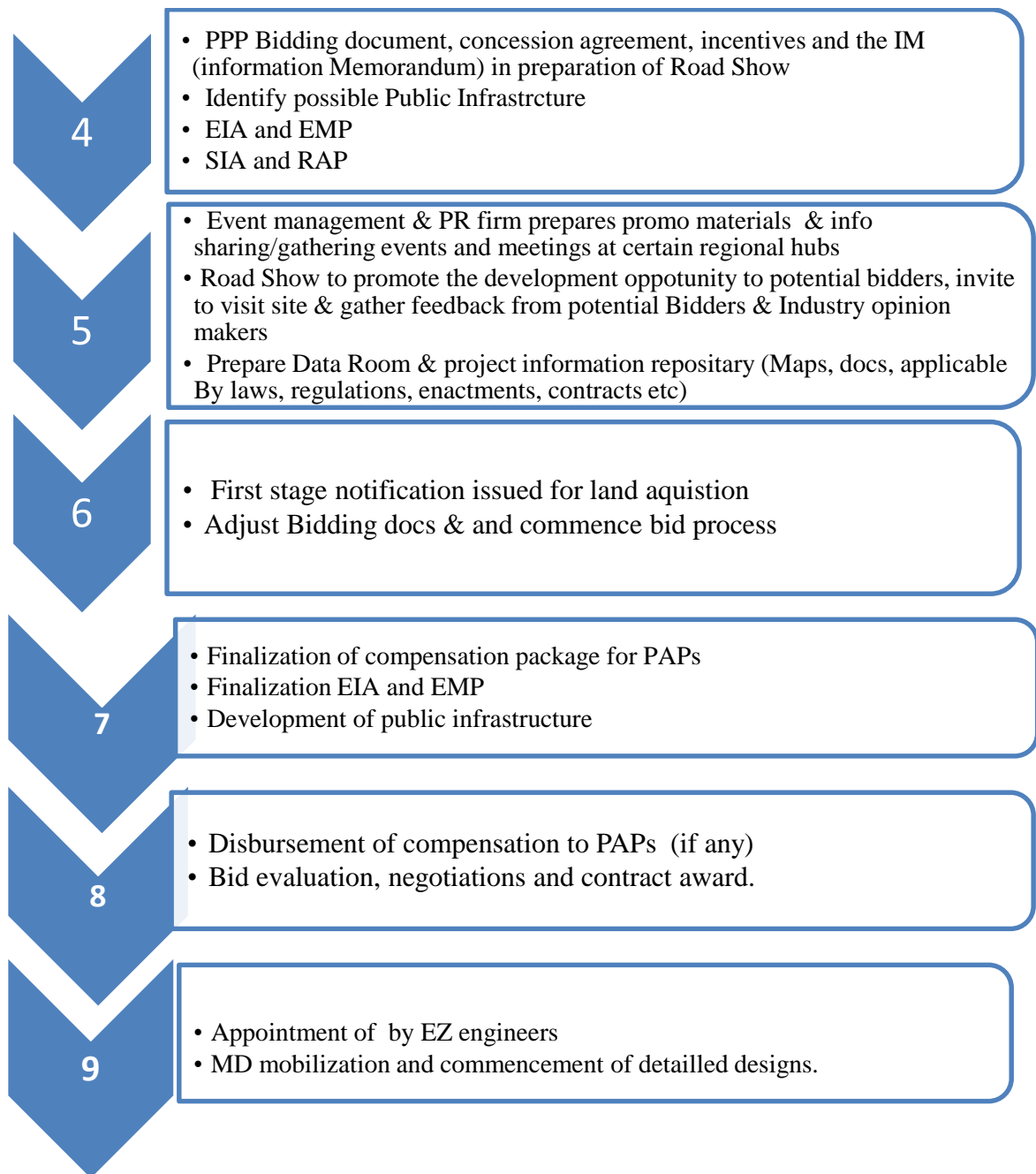
1. Site Development and various other EZ development activities
2. Public financed sub components of EZs such as rail / road links, etc.
3. Public financed common infrastructure in EZ offices, training centers, research centers and other facilities.
4. Public financed environmental infrastructure such as power distribution , water supply and distribution, sewerage and drainage, industrial effluent treatment, common effluent treatment, domestic / industrial / hazardous waste disposal facilities.
5. Other ancillary facilities to be developed publicly / privately for the EZs.

2.5 THE PSDSP PROJECT CYCLE

29. As indicated in the project development cycle below, the project involves twelve critical steps beginning with site assessment and demand surveys and resulting in finalization EZ operator and operation of the facility.

Figure 2 PSDSP Project Development Cycle





10

- Park authority/PFT monitors progress

11

- There will be contractual links (service provision & coordination) between MD, PFT & each service provider contracted outside the MD's main PPP arrangement

12

- Lease payments by tenants will be payable by MD
- Concession fee MD-Government

3. REGULATORY FRAMEWORK

3.1 OVERVIEW

30. The environmental legislations in Bangladesh provide the context within which the regulatory compliance of PSDSP projects is ensured. Similarly, the operational policies of The World Bank provide the context for environmental management in the project. It is hence, imperative that all the projects of PSDSP shall comply with the legal requirements of the GOB and the operational policies of the Bank.

3.2 ENVIRONMENT RELATED POLICIES IN BANGLADESH

31. The following section discusses the policies that regulate environmental management in Bangladesh and relevant to the sub-projects of PSDSP.
 - National Environmental Policy, 1992
 - National Environmental Management Action Plan, 1995
 - National Conservation Strategy, 1992
 - National Water Policy, 2000
 - National Water Management Plan, 2001

3.2.1 National Environmental Policy, 1992

32. The Bangladesh National Environmental Policy sets out the basic framework for environmental action together with a set of broad sectoral action guidelines. Key elements of the policy are:
 - Maintenance of the ecological balance and overall progress and development of the country through protection and improvement of the environment;
 - Protection of country's assets, properties and resources against natural disasters;
 - Identification & regulation of all activities which pollute and degrade environment;
 - Ensuring sustainable utilization of all natural resources;
 - Promoting active association with all environment related international initiatives.

33. The Environmental Policy requires the following specific actions with respect to the 'Industrial' sector:
- To phase in corrective measures in polluting industries;
 - To conduct Environmental Impact Assessment (EIAs) for all new public and private industrial developments;
 - To ban, or find environmentally sound alternatives for, the production of goods that cause environmental pollution; and
 - To minimize waste and ensure sustainable use of resources by industry.
34. Under the National Environmental Policy, Department of Environment is mandated to review and approve all Environmental Impact Assessments.

3.2.2 National Environmental Management Action Plan, 1995

35. The National Environmental Management Action plan (NEMAP) is a wide-ranging and multi-faceted plan, which builds on and extends the statements set out in the National Environmental Policy. NEMAP was developed to address issues and management requirements and set out the framework within which the recommendations of the National Conservation Strategy are to be implemented. NEMAP has the following broad objectives:
- Identification of key environmental issues affecting Bangladesh;
 - Identification of actions to halt or reduce rate of environment degradation;
 - Improvement of the natural environment;
 - Conservation of habitats and bio-diversity;
 - Promotion of sustainable development; and
 - Improvement of the quality of life of the people.

3.2.3 National Conservation Strategy, 1992

36. The National conservation strategy provides recommendations for sustainable development in the industrial sector as follows:
- All industries shall be subject to EIA and adoption of pollution prevention/control technologies shall be enforced;
 - Hazardous or toxic materials/wastes shall not be imported as raw materials;

- Import of appropriate and environmentally sound technology shall be ensured; and
- Dependence on imported technology and machinery should gradually be reduced in favor of sustainable local skills and resources.

3.2.4 National Water Policy, 2000

37. The National water policy recognizes that continued development and management of the nation's water resources is essential and includes protection, restoration and preservation of the environment and biodiversity including wetlands, mangrove and other natural forests, endangered species and water quality. It also states objectives for all agencies and departments entrusted with water management in regards to their responsibilities for regulation, planning, construction, operation and maintenance. Pollution of surface and ground water around various industrial centers from untreated effluent discharge into water courses is a critical water management issue. The Policy of the Government in this regard is that:

- Zoning regulations will be established for location of new industries in consideration of safe water availability and suitable effluent discharge possibilities;
- Effluent disposal will be monitored by relevant government agencies to prevent water pollution;
- Standards of effluent disposal into common watercourses will be set by Water Resources Planning Organization (WARPO) of the Ministry of Water Resources in consultation with DoE;
- Industrial polluters will be required by law to pay for remedial clean up of water bodies polluted by them.

3.2.5 National Water Management Plan, 2001

38. The National Water Management Plan addresses options for water quality, considerations behind measures to clean up industrial pollution, where effluent discharge monitoring and zoning regulations for new industries are emphasized.

3.3 RELEVANT LAWS AND REGULATIONS IN BANGLADESH

39. A large number of laws related to environmental issues, some dating back to the 19th century, exist in Bangladesh. The most important of these are the

Environmental Conservation Act, 1995 (ECA 1995) and the Environmental Conservation Rules (under the ECA, 1995, ECR 1997). Many of the other laws are cross sectoral and are only partially related to environmental issues.

40. Table 3.1 presents an outline of the National legal instruments along with a list of key governmental institutions that have regulatory power over environmental aspects associated with the projects financed by PSDSP.

Table 3.1: Environment Related Laws and Regulations

	Laws/ Regulations	Enforcing Agencies - Ministry/ Authorities
1.	The Environment Conservation Act, 1995 and subsequent amendments in 2000 and 2002	Department of Environment, Ministry of Environment and Forest
	<p><i>Regulated/ Enforced Items</i></p> <ul style="list-style-type: none"> • Declaration of Ecologically Critical Areas (Annex 1); • Obtaining Environmental Clearance Certificate for various projects; • Regulation with respect to vehicles emitting smoke harmful for the environment; • Regulation of development activities from environmental perspective; • Promulgation of standards for quality of air, water, noise, and soils for different areas and for different purposes; • Promulgation of acceptable limits for discharging and emitting waste; • Formulation of environmental guidelines relating to control and mitigation of environmental pollution, conservation and improvement of environment. 	
2.	Environment Conservation Rules, 1997 and subsequent amendments in 2002 and 2003	Department of Environment, Ministry of Environment and Forest
	<p><i>Regulated/ Enforced Items</i></p> <ul style="list-style-type: none"> • Declaration of ecologically critical Area; • Requirement of Environmental Clearance Certificate for various categories of projects; • Requirement for IEE/EIA according to the category of the project; • Renewal of environment clearance certificate within 30 days of expiry; • Provision of standards for quality of air, water & sound and acceptable limits for emission/discharges from vehicles and other sources. 	
3.	Environment Court Act, 2000 and subsequent amendments in 2002	Judiciary and Ministry of Environment & Forest
	<p><i>Regulated/ Enforced Items</i></p> <p>GOB has given highest priority to environment pollution and passed 'Environment Court Act, 2000' for completing environment related legal proceedings effectively.</p>	
4.	The Vehicle Act, 1927 The Motor Vehicles Ordinance, 1983 The Bengal Motor Vehicle Rules, 1940	Bangladesh Road Transport Authority (BRTA)

	<i>Regulated/ Enforced Items</i> Exhaust emission; Vehicular air and noise; Road safety; Licensing.	
5.	The Brick Burning (Control) Act, 1989 The Brick Burning (Control) Amendment Act, 1992	Ministry of Environment & Forest
	<i>Regulated/ Enforced Items</i> Control of brick burning requires a license from the MoEF; Restricts brick burning with fuel wood.	
6.	The Removal of Wrecks and Obstructions in inland Navigable Water Ways Rules 1973	Bangladesh Inland Water Transport Authority
	<i>Regulated/ Enforced Items</i> Removal of wrecks and obstructions in inland Navigable Waterways.	
7.	Water Supply and Sanitation Act, 1996	Ministry of Local Government, Rural Development and Cooperatives
	<i>Regulated/ Enforced Items</i> Management and Control of water supply and sanitation in urban areas.	
8.	The Ground Water Management Ordinance 1985	Upazila Parishad
	<i>Regulated/ Enforced Items</i> Management of ground water resources; Tube well shall not be installed in any place without the license granted by Upazila Parishad.	
9.	The Forest Act, 1927 and subsequent amendments in 1982 and 1989	Ministry of Environment and Forest
	<i>Regulated/ Enforced Items</i> Reserve Forests; Protected Forests; Village Forests.	
10.	The Private Forests Ordinance Act, 1959	Regional Forest Officer, Forest Department
	<i>Regulated/ Enforced Items</i> Conservation of private forests and for the afforestation on wastelands.	
11.	Bangladesh Wild Life (Preservation) Act, 1974	Ministry of Environment and Forest Bangladesh Wild Life Advisory Board
	<i>Regulated/ Enforced Items</i> Preservation of Wildlife Sanctuaries, parks, reserves.	
12.	The Protection and Conservation of Fish Act 1950 subsequent amendments in 1982	Ministry of Fishery
	<i>Regulated/ Enforced Items</i> Protection and Conservation of fishes in Government owned water bodies.	
13.	Natural Water Bodies Protection Act 2000	RAJUK/Town Development Authority/Municipalities
	<i>Regulated/ Enforced Items</i> According to this Act, the character of water bodies i.e. rivers, canals, tanks, or floodplains identified as water bodies in the master plans or in the master plans formulated under the laws establishing municipalities in division and	

	district towns shall not be changed without approval of concerned ministry.	
14.	The Embankment and Drainage Act 1952	Ministry of Water Resources and FCD
	<i>Regulated/ Enforced Items</i> An Act to consolidate the laws relating to embankment and drainage and to make better provision for the construction, maintenance, management, removal and control of embankments and water courses for the better drainage of lands and for their protection from floods, erosion and other damage by water.	
15	Antiquities Act 1968	Ministry of cultural Affairs
	<i>Regulated/ Enforced Items</i> Governs preservation of the national cultural heritage, protects and controls ancient monuments, regulates antiquities as well as the maintenance, conservation and restoration of protected sites and monuments, controls planning, exploration and excavation of archaeological sites.	
16	The Building Construction Act 1952 (with amendments)	Ministry of Works
	<i>Regulated/ Enforced Items</i> An Act to provide for the prevention of haphazard construction of building and excavation of tanks which are likely to interfere with the planning of certain areas in Bangladesh	
17	The Land Acquisition Act, 1894 and The Acquisition and Requisition of Immovable Property Ordinance 1982 and subsequent amendments in 1994, 1995, 2004	Revenue Department
	<i>Regulated/ Enforced Items</i> Current GoB Act & guidelines, relating to acquisition of land	
18	The Factories Act, 1965 Bangladesh Labor Law, 2006	Ministry of labor
	<i>Regulated/ Enforced Items</i> This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions.	

3.4 ENVIRONMENTAL GUIDELINES FOR PROJECTS IN BANGLADESH

41. As identified out earlier, the most important laws/rules in table 3.1 are the ECA 1995 and the ECR 1997. The ECA1995 is primarily an instrument for the Department of Environment (DoE) and for controlling industrial pollution. The ECR, 1997 was promulgated under ECA, 1995 to operationalize the enforcement of the Act. Depending on the extent of impact on the environment, the Department of Environment classifies all the projects in four categories. These are:

- i) Green;
- ii) Orange- A;
- iii) Orange- B; and
- iv) Red

3.4.1 Green Category

42. Projects/industries which do not have any negative impact on the environment belong to Green category (presented in Annex 3) projects. For this category of projects, no Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) is required. However, the project proponent will have to submit an application in a prescribed format to DOE for Site Clearance Certificate and Environmental Clearance Certificate.

Examples

- Bamboo and cane goods;
- Candle, watches etc. assembling and manufacturing; and
- Cork (excluding metallic item).

3.4.2 Orange A and B Category

43. Orange category includes those projects that produce such wastes that can produce moderate or significant impacts on environment but the impacts could be mitigated easily if proper action is undertaken (presented Annex 3). Depending on the nature and extent of impacts the projects under Orange category has been sub-divided into two sub-categories-Orange A and Orange B. The projects/industries likely to produce some wastes but are not believed to be significantly harmful to the surrounding environment and can be managed easily are categorized under “Orange A”.

Examples

- Small hotel/restaurant business;
 - Weaving factory;
 - Handloom industry;
44. The “Orange B” category projects/industries are those likely to produce some adverse environmental impacts but not considered to be overly significant and that the impacts can be mitigated with no residual adverse impacts.

Examples

- Mineral water, soft drink, etc., manufacturing and bottling;
- Processing of fish;
- Meat and other food items;

3.4.3 Red Category

45. This category includes projects/ industries that may have a significant impact on the surrounding environment and that these adverse impacts must be properly managed or controlled (presented in Annex 3). These project/industries must first require an IEE for the purpose of obtaining site clearance, and then EIA, for obtaining environmental clearance. In this case also an application has to be made in a prescribed format along with an IEE report, on the basis of which site clearance may be granted with suitable conditions or the project may be rejected, on grounds of unsuitable location. If the site clearance is granted the project proponent can go ahead with implementation of the project subject to the conditions as may be stipulated while granting the site clearance.

Examples

- Port development including container terminals, island container depot etc.;
 - Telecommunication systems, networks and services including Information and Communication Technology (ICT);
 - Power generation, transmission, distribution and services;
 - Garment dyeing operations;
 - Steel and other major industrial operations.
46. *As identified in section 2.4, PSDSP comprises six categories of sub-projects. While sub-project categories 1,2,3 and 5 will come under red category of ECR and sub-projects categories 4 and 6 will under orange category ECR, requiring ECC depending the exact nature of the proposed activities.*

3.5 PROTECTED AREAS

3.5.1 Ecologically Critical Area (ECA) in Bangladesh

47. The Environment Conservation Act, 1995 and the Environment Conservation

Rules, 1997, refer to Ecologically Critical Areas Bangladesh. According to this legislation, environmental protection is deemed particularly relevant in Ecologically Critical Areas, which are defined by the Government as areas where degradation of the environment has reached or threatens to reach a 'critical' state. Specifically, under the Environment Conservation Act and Rules, the Government will take into special consideration areas such as human settlements, ancient monuments, archeological sites, forest sanctuaries, national parks, game reserves, wildlife habitats, wetlands, mangroves, forested areas, biodiversity areas, and other similar areas. Department of Environment of Bangladesh has declared 12 areas, mostly wetlands, as ECA (presented in Annex 1), which include Hakaluki Haor, Sonadia Island, St Martin's Island, Teknaf Peninsula (including Cox's Bazar Sea Beach, but not their buffer zones), Tanguar Haor, Marjat baor (oxbow lake) and 10 km peripheral distance from the identified Sundarbans Reserved Forest, and entire four rivers (Buriganga River, Shitalakshya Rover, Turag River and Balu River) flowing within and surrounding Dhaka city.

3.5.2 Protected Areas

48. Article 23 of the Wildlife Order of GoB, has provisions for declaration of Protected Areas and also has regulations prohibiting activities in the Protected Areas. These protected Areas include Wildlife Sanctuary, National Park and Game Reserve. Their definitions in the Bangladesh Wildlife (Preservation) Order, 1973 (henceforth Wildlife Order) is as follows:
49. "Wildlife Sanctuary means an area closed to hunting, shooting or trapping of wild animals and declared as such under Article 23 by the government as undisturbed breeding ground primarily for the protection of wildlife inclusive of all natural resources such as vegetation soil and water" (paragraph (p) of Article 2).
50. "Game Reserve means areas declared by the government as such for the protection of wildlife and increase in the population of important species wherein capturing of wild animals shall be unlawful (paragraph (c) of Article 2)".
51. Overall, the 'Protected Area' of Bangladesh covers an area of 243,435 hectare which accounts for 16% of the total area managed by the Forest Department and almost 2% of total area of Bangladesh. It includes 8 National Parks, 7 Wildlife Sanctuaries, 1 Game Reserve and 5 other conservation sites (The list of Protected Areas is presented in Annex 2). These five conservation sites are National Botanical

Garden, Dhaka, Baldha Garden, Dhaka, Madhabkunda Eco-Park, Moulavibazar, Sitakunda Botanical Garden and Eco-Park, Chittagong and Dulahazara Safari Parks & Cox's Bazar.

52. *Projects sites, presently identified for PSDSP- EZ Development projects do not fall under the jurisdiction of any of the protected or ecologically sensitive areas in the Bangladesh .*

3.6 ENVIRONMENTAL INSTITUTIONS IN BANGLADESH

3.6.1 Department of Environment (DoE)

53. Department of Environment (DoE) on behalf of the Ministry of Environment and Forest (MoEF), GoB is the institution responsible for environmental management in Bangladesh. The Department was created in 1989 to ensure sustainable development and conserve and manage the environment of Bangladesh. The department is responsible for implementation of the following policies, acts&rules.
- Environment Policy, 1992;
 - Environmental Conservation Act,1995,including amendments in 2000&2002;
 - Environmental Conservation Rules,1997 including amendments in 2002&03;
 - Environment Court Act, 2000 and subsequent amendments in 2002
54. The principal activities of DoE are:
- Defining Environmental Impact Assessment (EIA) procedures and issuing environmental clearance permits - the latter being legal requirement before projects can proceed to implementation stage;
 - Providing advice or take direct action to prevent degradation of environment;
 - Pollution control, including the monitoring of effluent sources and ensuring mitigation of environmental pollution;
 - Setting the water quality standards for particular uses of water and for discharges to water bodies; and
 - Declaring Ecologically Critical Areas where the ecosystem has been degraded to a critical state.

3.6.2 Department of Forest

55. The Department of Forest is responsible for the protection of four types of legally protected areas-wildlife sanctuaries,game reserves,reserved forests&natural forests.

3.7 DOE CLEARANCE PROCEDURES

56. The DoE, clearance procedure for various projects identified under ECR would need to go through the following two stage process.

- a) Initial Stage: Site Clearance Certificate (SCC)
- b) Advanced Stage: Environmental Clearance Certificate (ECC)

57. a) **Initial Stage**

The first step for the project proponent is to complete an application form that may be obtained from the appropriate DoE Divisional office. The application form (Annex 4), with a covering letter, is then addressed to the Director/Deputy Director of the respective divisional office of the Department of Environment as prescribed in Form-3 of the Environment Conservation Rules, 1997. The application should include a project feasibility study, the IEE/EIA report, No Objection Certificate of the local authority, mitigation plan for minimizing potential environmental impacts, and a Treasury 'Chalaan' of prescribed fee. The DoE reserves the right to request additional information, supporting documents or other additional materials for the proposed project. Initially, for obtaining the SCC, the following two documents need to be submitted to the DOE:

- An Initial Environmental Examination (IEE) Report and
- A TOR for Environmental Impact Assessment - with process flow diagram

58. Under the conditions specified in the Environment Conservation Rules-1997, the DoE Divisional Authority must issue environmental site clearance within 60 working days or the refusal letter with appropriate reason for such refusal. Without the SCC, the sponsor cannot apply for approval of the civil design of the project to the local authorities. After the SCC is obtained, the sponsor can proceed for land development and other primary civil works.

59. b) **Advanced Stage**

After receiving the SCC, land development may proceed but the entrepreneur/developer needs to proceed for the ECC before initiating operations. The procedures for obtaining the ECC for different categories of projects are provided in the ECR. Green category industries are to be granted an ECC within 15 days from the date of application. For other categories (Orange A & B and Red) of industries/projects, application for the ECC must include a 'Feasibility Report (FR)' and an 'Initial Environmental Examination (IEE)' report along with a 'Terms of Reference' for the EIA. For Orange A category projects, the IEE is sufficient for obtaining the ECC.

60. In the next step for Orange B and Red category projects, an EIA has to be submitted based on the approved ToR and is subject to DOE clearance. After the EIA approval, facility construction and machinery purchase/installation may begin, but the ECC must be obtained before commercial operations begin. The steps involved in securing ECC for a red category project is presented in Figure 3.

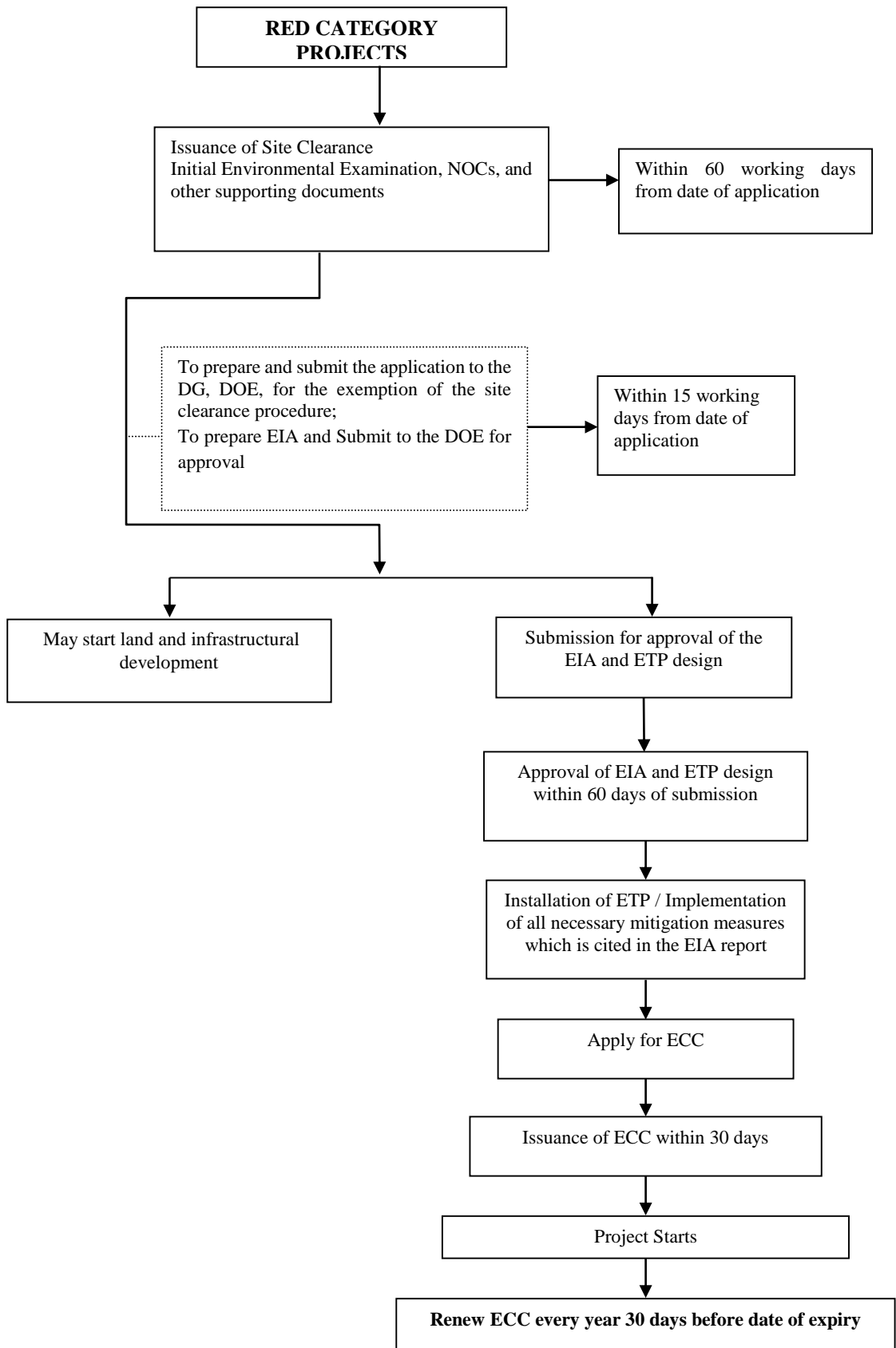


Figure 3: Various steps of Environmental Clearance Process of DOE

61. c) **Validity Period of Environmental Clearance Certificate**

Categories of Project	Validity	Renewal Period
Green	3 year	30 days before expiry of the validity period
Orange A & B	1 year	
Red	1 year	

62. *The EZ/EPZs proposed to be developed under PSDSP as per ECR will be considered a red category project/facility, and will have to secure ECC. The enterprises operating within the zone will be classified according to the nature of its operations/industry and shall comply with appropriate DOE regulations.*

3.8 APPLICABLE SAFEGUARD POLICIES OF THE WORLD BANK

63. Safeguard policies of The World Bank are aimed at avoiding and / mitigating environmental impacts associated with projects supported by the Bank. Safeguard policies of the Bank that could be triggered for PSDSP are summarized below.

Table 3.2: The Safeguard Policies of World Bank on Environmental Issues

S.No	World Bank Policy	Reasons of Applicability	Addressed by
1	Environmental Assessment OP 4.01	Project is likely to have impact on natural environment. Particularly, air, water land, human safety, natural habitats, forestry.	Carrying out an Environmental Assessment and preparing an environmental management plan to avoid/mitigate environmental impacts
2			
3			

3.9 PROJECT CATEGORIES AS PER THE SAFEGUARD POLICIES OF THE WORLD BANK

64. Based on project type and scale, project location, sensitivity of issues, nature and magnitude of impacts, the OP 4.01 of the World Bank classifies the projects into three categories - Category A, Category B and Category C.

65. **Category A**

A project is classified as Category A, if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. Environmental Assessment for a 'Category A' project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. For a 'Category A' project, the borrower is responsible for preparing a report, normally an EA (or a suitably comprehensive regional or sectoral EA) and prepares an Environmental Management Plan to mitigate the negative impacts of the project.

66. **Category B**

A project is classified as 'Category B' if its potential adverse environmental impacts on human population or environmentally important areas, including 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. The scope of EA for a 'Category B' project may vary from project to project, but it is narrower than that of Category A' project. Similar to 'Category A' project, the EA examines the potential negative and positive environmental impacts of the project and recommends an Environmental Management Plan to mitigate measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

67. **Category C**

A project is classified as Category C, if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no EA is required for Category C project.

3.9.1 COMPARISON BETWEEN GOB AND WB GUIDELINES

68. A comparison of environmental regulations of Bangladesh and the safeguard policies of the Bank (as presented in table 3.3) indicates that, the requirements of OP 4.01 of the Bank are more comprehensive than that of GoB. The key differences include the following.

- i) Categorization of projects based on industrial operations in Bangladesh as against the Bank' categorization of all projects based on the nature of impacts
- ii) Absence specific requirements of EA outputs as against specific EA requirements in Bank policies
- iii) Absence of public consultation and disclosure requirements in Bangladesh as against these being very critical for requirements of the Bank

Table 3.3 Comparison between GoB and World Bank Guidelines

S.No	Criteria	Requirements as per GoB	Requirements as per OP 4.01
1	Environmental Analysis	Project specific	Project specific, regional and sectoral
2	Basis for Categorization	Currently, screening criteria available only for industrial projects, where assessment is done based on: <ul style="list-style-type: none"> • Level of pollution emission • Type of project and location • Scale of project • Operational activities Non-industrial projects are reviewed on a case by case basis by DOE	Detailed screening criteria for all projects based on <ul style="list-style-type: none"> • Sensitivity • Nature and magnitude of potential impacts
3	EA Outputs	Since detailed rules and regulations for EA have not been prescribed, EA outputs are not specified. However, the industrial sector guidelines, the water	<ul style="list-style-type: none"> • EA Report • Analysis of alternatives • Environmental Management

		sector guidelines and the road sector guidelines have specific EA output requirements, such as: <ul style="list-style-type: none"> • Baseline survey • IEE/EIA Report • Site clearance • Risk analysis and management • Analysis of alternatives 	Plan
4	Public Consultation	No special mention is made for public consultation in BECA. Sectoral guidelines mentioned above have prescribed consultation.	Mandatory at the stage of <ul style="list-style-type: none"> • Preparation of EA • Project appraisal • Project design • Project implementation and monitoring
5	Disclosure of Information	BECA makes no reference to disclosure. The Sectoral guidelines prescribe some provisions for disclosure	Mandatory at <ul style="list-style-type: none"> • Summary of project description an potential adverse impact • Summary of EA report and conclusion • EA report

69. Based on the regulatory review, it is summarized that the PSDSP project will follow all the safeguard policies of the The World Bank and prepare the necessary management / mitigation plans to address the safeguard risks in the project. Further, all the applicable regulatory requirements of GoB will be fully complied both by the project implementing agencies, zone operators and the industries operating in the zone.

4. ENVIRONMENTAL MANAGEMENT PROCEDURES IN PSDSP

4.1 GENERAL

70. The Environmental Management Procedures developed for PSDSP are aimed at minimizing the environmental impacts of the project and ensures adequate integration of environmental aspects in the project planning, design, construction and operation phases. In addition to complying with the regulatory requirements of GoB and the safeguard policies of The World Bank, the procedures provide a framework to (i) identify, predict, and evaluate beneficial and adverse environmental impacts of project activities, (ii) designing enhancement measures for beneficial impacts, and (iii) suitable institutional arrangements to implement the environment management measures.
71. Sections below present the key environmental issues associated with sub-projects of PSDSP and the procedures set out in the project to address / avoid these issues.

4.2 ENVIRONMENTAL ISSUES IN EXPORT PROCESSING ZONES

72. The environmental impacts of EZ / EPZs proposed to be set up in PSDSP broadly depend on the nature and type of zone and local environmental conditions of the area they are located. These impacts may be categorized as below.
- Impacts on water resources due to disposal of untreated industrial effluents;
 - Health impacts due to air emissions from stack & other industrial operations;
 - Impacts due to disposal of solid & hazardous wastes, including waste sludge;
 - Hazards due to storage, handling and use of chemicals/hazardous materials;
 - Impacts due to ground / surface water extraction;
 - Impacts due to disposal of untreated domestic wastewater;
 - Indirect impacts due to land use change, increased traffic & other developments
73. The initial assessment of potential sub-projects of PSDSP (Kaliakoir Hi-Tech Park) in the preparation of PSDSP and Environmental Assessment studies carried out during the implementation of PSDSP for Jessore MTB, Sylhet HTP, Mongla EZ, and Miroshorai EZ, indicate that the EZ / EPZs could also have the following site specific impacts.
- Interference to natural drainage paths due to the siting of EZ / EPZs;

- Pollution of surface and ground water sources;
- Impacts on environment during construction
- Potential environmental liabilities of non-compliant industries;

4.3 PROJECT CATEGORIZATION

74. In order to address various environmental issues associated with the project and to formulate suitable strategies, the sub-projects of PSDSP are categorized as below.
- ‘Category A’ sub-projects that have potential to cause significant, adverse environmental impacts in the project influence area;
 - ‘Category B’ sub-projects that have potential to cause moderate and reversible environmental impacts in the project area;
 - ‘Category C’ sub-projects that have potential to cause minor and temporary environmental impacts, primarily during construction phase of the project.

Table 4.1 Environmental Categorization of PSDSP Sub-Projects

S.No	Sub-Project	Environmental Category
1	Complete EZ (RMG, IT or others) development by the project implementing agencies	A
2	Site development and other EZ development activities	A
3	Public financed components of EZ such as rail/road link, etc.	A
4	Public financed common infrastructure in EZ offices, training centers, research centers and other facilities	B
5	Public financed environmental infrastructure such as power distribution , water supply& distribution, sewerage & drainage, industrial effluent treatment, common effluent treatment, domestic/industrial/hazardous waste disposal facilities	A
6	Other facilities to be developed publicly/privately for EZs	B

- 75. As presented in table 4.1, four of the six currently identified sub-projects are categorized as ‘Category A’ and the other two projects are categorized as ‘Category B’.
- 76. In addition to the above, should there be any new sub-projects identified in PSDSP, these new projects will be categorized based on the criteria defined above will be subjected to the environmental analysis set out in this EMF.

4.4 ENVIRONMENTAL ASSESSMENT OF SUB-PROJECTS

- 77. As summarized in section 3 on regulatory review, any new zone development would be required to perform an EIA and obtain an ECC from the GoB. Similarly, all ‘Category A and B’ projects would need to perform an EA to comply with the safeguard policies of The World Bank.
- 78. In line with both these requirements, all ‘Category A’ and ‘B’ sub-projects (identified as per the criteria established in section 4.3) will be subjected to an environmental assessment process, and will ensure that all key environmental issues are addressed in the project. This shall comprise the following steps.
 - i) a screening exercise that identifies the project category and establishes the need for conducting an EA;
 - ii) an IEE that defines the scope of EA (for category A and B Projects) and generic EMP for Category C projects;
 - iii) Securing site clearance certificate and commencement of EA;
 - iv) Prepare EA and EMP and secure clearances (DoE and Bank);
 - v) Implement EMP and monitor its effectiveness.

These steps are detailed further in table 4.2, below and a guidance note on carrying out environmental assessment and preparation of environmental management plan is provided in Annex 15.

Table 4.2: Environmental Management Process in the Project Development Cycle

<i>A</i>	<i>Project Identification & Pre-Feasibility Studies (Pre-Construction) Phase</i>
	<ol style="list-style-type: none"> 1. Environmental Screening : Categorization of the project (as identified in section 4.3), establishment of the need for conducting EA, and excluding activities that impact natural habitats, forests, physical cultural resources and attract the policy on pest management.

<i>B</i>	<i>Project Design Phase</i>
	<ol style="list-style-type: none"> 2. Initial Environmental Examination (IEE): Assess environmental impacts, determine scope of EA and key issues to be considered in project design. 3. Scoping: identify significant potential impacts and project alternatives (including avoidance of activities that impact natural habitats, forests, physical cultural resources and attract the policy on pest management, and propose terms of reference for the EIA. 4. Secure Site Clearance Certificate from DoE and Commence EA 5. Baseline Data Collection: identify current environmental conditions without the project and anticipate future impacts due to project interventions. 6. Public consultation with all stakeholders at various stages in the assessment process to ensure quality, comprehensiveness and effectiveness, and that stakeholder views are adequately addressed. 7. Prepare EIA Report: summarize all information obtained, analyzed and interpreted in a report form; should contain a non-technical summary including methods used, results, interpretations and conclusions. The report should also include recommendations for mitigation of negative impacts, enhanced opportunities and relevant policy and regulatory actions. The report should be shared with stakeholders participating in the consultation process and affected by the recommendations and time for feedback should be allowed. 8. Prepare Environmental Management Plans of the project to determine specific actions to be implemented during the designing of the project that includes plans for engineering design and construction stages to minimize or mitigate adverse environmental impacts. 9. Design mitigation measures: to avoid, reduce and minimize adverse environmental impacts and enhance beneficial impacts.
<i>C</i>	<i>Project Appraisal/ Approval (Financing) Phase</i>

	10. Review and Approval of EIA Report: review report to assess if all issues have been adequately addressed and to facilitate the decision-making process; decide if project should proceed (ECC from DoE and review of report by The World Bank), or if further alternatives must be examined.
<i>D</i>	<i>Construction Phase</i>
	11. Implementation of Environmental Management Plan (EMP) to address adverse environmental impacts. 12. Environmental Monitoring to determine compliance with EMP. 13. Mid-term independent evaluation to assess the continued relevance of the mitigation plans and need for any alterations based on actual developments during the construction phase.
<i>E</i>	<i>Post-Construction Phase</i>
	14. Environmental Audit: As per the recommendations of EIA study. 15. Regular monitoring arrangements to record and evaluate progress against initial plans and potential new challenges and opportunities.

4.4.1 Environment Management Requirements for Individual Enterprises in EZ / EPZs

79. Good environmental management practices by the individual EZ/EPZ enterprises/tenants are very important to avoid impacts during operational phase of project. To ensure this, PSDSP mandates all tenants to connect to the following common facilities and comply with maintenance requirements (pre-treatment, maintenance charges, etc.).
- i) Common Effluent Treatment Plants, with tertiary treatment for reuse/recycling
 - ii) Common Hazardous Waste Disposal Facilities
 - iii) Common Solid Waste Disposal Facilities
 - iv) Common Wastewater Treatment Plant with reuse /recycling facilities
 - v) Integrated rainwater harvesting and water supply facilities
 - vi) Adequate plantation (both in the EZ / EPZ and individual plot) to minimize air and noise impacts
80. In addition to the above, all the tenants shall fully comply with the GoB regulatory

requirements such as the following.

- i) Conducting IEE and securing SCC prior to allotment of the plot in the EZ / EPZ
- ii) Conducting EIA and securing ECC (as applicable) prior to the commencement of construction
- iii) Implementation of EMP and ECC conditions during and operation phase
- iv) Ensuring compliance to environmental regulation of GoB during operation
- v) In addition to the above, the environmental management and monitoring tools developed by BEPZA, through the Bangladesh Investment Climate Fund (BICF) project, shall be adopted (as applicable) to improve environmental performance of the enterprises. These tools include Environmental Monitoring & Enforcement Plan Guidelines, Environmental Best Management Practice Manual, Environmental Audit of Enterprises, Environmental Enforcement Strategy, Environmental Inspection Forms & Modules, Evaluation & Rating Criteria for Enterprises

81. All these aspects will be incorporated in the tenant lease agreement of the EZ / EPZ and shall be monitored for its implementation by Environmental Cell of EZ / EPZ operator. A sample set of environmental specifications for Bid documents and tenant lease conditions of BEPZA on environmental requirements are provided in Annex 16 and 17 respectively. The same shall be appropriately modified and incorporated in the respective sub-projects documents.

5. INSTITUTIONAL FRAMEWORK

5.1 OVERALL PROJECT IMPLEMENTATION ARRANGEMENTS

82. The overall management of PSDSP project will be carried out by the Central Co-ordination Unit (CCU) set up for the purpose and the sub-projects will be managed and implemented by the respective implementing agencies. Depending on the type of the sub-project, these agencies will be BEZA HTPA, and BEPZA. Both the CCU and the PIUs will be adequately staffed to implement the projects.

5.2 INSTITUTIONAL SET UP FOR ENVIRONMENT MANAGEMENT

83. The institutional arrangements for the implementation of various aspects of EMF and environment management of PSDSP comprise the following.
- *Environment Management Cell (EMC) at CCU* to monitor all the aspects of environmental management of the project
 - *Project Environment Cell (PEC) at PIU* to ensure adequate integration of environment management measures in the design phase and supervise implementation of EMF and specific requirements of EMP
 - *Environment Management Unit (EMU) at EZ / EPZ* to implement EMP and other regulatory requirements during construction & operation phase of EZ / EPZ.

5.2.1 Environment Management Cell (EMC) at CCU

84. To coordinate and ensure the implementation of the EMF, an Environment Management Cell (EMC) will be set up at the CCU. The EMC will be headed by an 'Environmental Specialist' and will be supported by experienced 'Environmental Engineers'. The EMC will monitor the environment management aspects of PSDSP and will be responsible for the following.
- Ensure that all the sub-project proposed for implementation through PSDSP comply to the project categorization and other requirements of EMF;
 - Identify regulatory requirements of sub-projects and monitor their compliance at all stages of the project;
 - Identify and ensure integration of various aspects of environmental

management in the respective contract documents / tenant lease agreements of Master Developer/ Operator /contractor and individual enterprises/ tenants;

- Co-ordinate with respective implementing agencies and contractors / operators and ensure that the environmental management measures are implemented as per the respective EMPs and ECC clearance conditions;
- Advise the environment staff at implementing agencies and the EZ / EPZ on various matters of environmental management;
- Prepare periodic progress reports on the implementation of the EMF and share with the Bank and other monitoring agencies.

5.2.2 Project Environment Cell (PEC) at PIU

85. The Project Implementation Unit (PIU) will establish a Project Environmental Cell (PEC) headed by a ‘Manager – Environment’ and supported by environmental engineers. The PEC will function to:

- Supervise implementation of EMF throughout project implementation period;
- Ensure integration of the EA and the EMP measures into the sub-project design and implementation plans such as contract documents, maintenance contracts, tenant lease agreements, etc;
- Supervise the implementation of the mitigation measures by the Master developers / Contractors;
- Assist the engineering staff and other PIU staff in addressing environmental issues during planning, design and implementation of the sub-projects;
- Prepare periodic progress reports on the implementation of the EMP throughout the project period.

5.2.3 Environment Management Unit (EMU) at EZs / EPZs

86. In order to implement various environmental management measures at EZ / EPZs, the master developer / contractor / operator will set up an Environment Management Unit (EMU) for each zone. The EMU will consist of environmental engineers with relevant experience on environmental issues associated with the type of zone being set up. The EMU will function all through construction and operation phase of the EZ / EPZ and perform the following functions.

- Identify regulatory requirements of the sub-project and initiate necessary

actions / studies to ensure compliance to the same;

- Co-ordinate with DoE and PIU and ensure securing SCC and ECC as applicable for the project(s);
- Co-ordinate with the contractors / sub-contractors and all other agencies involved in the development and operation of EZ / EPZ and ensure that all the requirements of EMP are fully complied;
- Ensure that all the common environmental infrastructure in EZ / EPZ is operated and maintained in compliance with the regulatory requirements of GoB;
- Liaise with individual enterprise/tenants and ensure that all environmental management conditions of the tenant lease agreement are fully complied;
- Prepare regular reports on environment management and submit to PIU/GoB.

5.3 MONITORING AND REPORTING

87. The implementation of EMF and other agreed actions of environmental management during construction and operation phase of the sub-projects, will be monitored by EMC, a combination of regular visits to the sub-project locations and periodic reports from the PEC. While the EMC will carry out monthly visit to the site and submit quarterly progress reports to the Bank, the PEC will conduct fortnightly visits and submit monthly reports to PEC.

Table 5.1 Monitoring and Reporting Requirements of PSDSP

	Field Visit	Reports
1.Environment Management Cell (EMC) at CCU	Monthly	Quarterly to Bank
2.Project Environment Cell (PEC) of PIU	Fortnightly	Monthly to EMC
3.Environment Management Unit (EMU) of EZ / EPZ	Daily	Monthly to PEC

5.3.1 Annual Audit / Review of EMF Implementation

88. An annual review/audit of EMF implementation will be carried out by an independent agency or professional. The objectives of the audit will be to;
- Review the project’s compliance with all regulatory and environmental management requirements of GoB and the Bank;
 - Assess compliance with EMF procedures, lessons learned and requirements

for improving the EMF

- Review the implementation of sub-project specific EMP and its effectiveness

Based on the outcomes of annual audit, the EMF will be revised / updated appropriately.

6. CAPACITY BUILDING & TRAINING FOR ENVIRONMENTAL MANAGEMENT

6.1 CAPACITY BUILDING

89. The implementation of EMF and number of environmental management measures of PSDSP are dependent on the capacity of the implementing agencies in environmental management. In order to ensure this, a program of capacity building for HTPA, BEZA, BEPZA, , Master Developers, contractors and the other stakeholders will be put in place to ensure that, the capacity to carry out environment management activities for industrial and EZ / EPZ projects is developed.
90. The capacity building program will enhance the subproject's EMF management by allowing real application of the critical practices such as the following:
 - *Basic practices:* screening impacts, scoping assessments, planning mitigation options, public consultation to assess feasibility and acceptability options;
 - *Environment:* site selection and project design to minimize environmental impacts and social disruption; restoration of drainage patterns, land use etc; including mitigation measures in contracts; management of impacts during construction; monitoring of effectiveness of measures;
 - *Monitoring:* Monitoring environmental performance, reporting, supervision use of various formats during implementation and operation phase, documentation, complaint response, record keeping and other procedures;

6.2 TRAINING PROGRAMS

91. A comprehensive training plan will be designed, which aims at enhancing capacity of relevant stakeholder agencies and with the following objectives.
 - identify,prepare,implement & manage environmental aspects of sub-projects;
 - ensure that the agencies have the capacity to assist in preparing sub-project

proposals, mitigation plans; and

- ensure that the implementing agencies have the capacity to appraise, approve and supervise the implementation of subprojects; and training plans will be prepared accordingly.

92. The key requirements of the above training program meeting the above objectives are summarized in table 6.1.

Table 6.1: Requirements of training for personnel involved in PSDSP

Officials	Training requirements
EMC and PEC	<ul style="list-style-type: none"> • Environmental awareness program; • Interpretation of operational policies of the Bank; • Rules and regulations concerning the procedures and methodology in EIA for PSDSP.
EMC, PEC, EMU and Project Managers / Construction Manager in implementing agency	<ul style="list-style-type: none"> • Environmental awareness program; • Rules and regulations concerning the procedures and methodology in EIA for PSDSP; • Preparation of environmental assessment reports; • Methodologies of EIA implementation; • Formulation of environmental remedial measures; • Public Consultation and participation; • Implementation of monitoring program; • Techniques of data management and development of databases;
Implementation agency staff associated with design, construction, supervision,	<ul style="list-style-type: none"> • Environmental awareness program; • Evaluation of environmental impacts; • Environment-related standards and guidelines for engineering design;

Officials	Training requirements
Site Engineers and construction supervisors	<ul style="list-style-type: none"> • Formulation of environmental remedial measures; • Methodologies of EIA implementation; • Enforcement of environmental remedial measures; • Public Consultation and participation; • Methods of data collection and presentation; • Methodologies monitoring effectiveness of EMP implementation. <ul style="list-style-type: none"> • Methods of interaction with stakeholders and the public; • Environmental awareness program; • Evaluation of environmental impacts; • Environment-related standards and guidelines for engineering design; • Formulation of environmental remedial measures; • Methods of information and data collection and presentation.

93. These training activities and capacity building program will be developed and implemented by professional agencies with adequate experience in imparting such training programs. The resources for implementing the program will be allocated from the respective component of PSDSP and will be coordinated by the Environment Management Cell (EMC) of the Central Co-ordination Unit.

Annex 1: Ecologically Critical Areas declared by DoE

Ecologically Critical Areas (ECAs)	Total Area, (Ha)	Name of District	Name of Upazila	Name of Union/Pourashava	Name of Mouza
Sundarban	7,62,034	Bagerhat, Khulna and Satkhira	Upazilas within 10 km peripheral distance of the identified reserve forest area.	Unions/Pourashavas under the Upazilas listed in the previous column.	Mouzas under the Unions/Pourashavas listed in the previous column.
Cox's Bazar-Teknaf sea beach	10,465	Cox's Bazar	Cox's Bazar	Cox's Bazar, Zilonja, and Khuruskul	Sea beach, sand rim, estuary, forest, wetland, etc. as recorded in the register of Land Revenue Dept., Cox'sBazar.
			Ramu	Khunia Palong	Jungle Khunia Palong, Jungle Dhoa Palong, Pecher Deep and Jungle Gorasia Palong.
			Ukhia	Ukhia and Zalira Palong	Zalira Palong and Inani

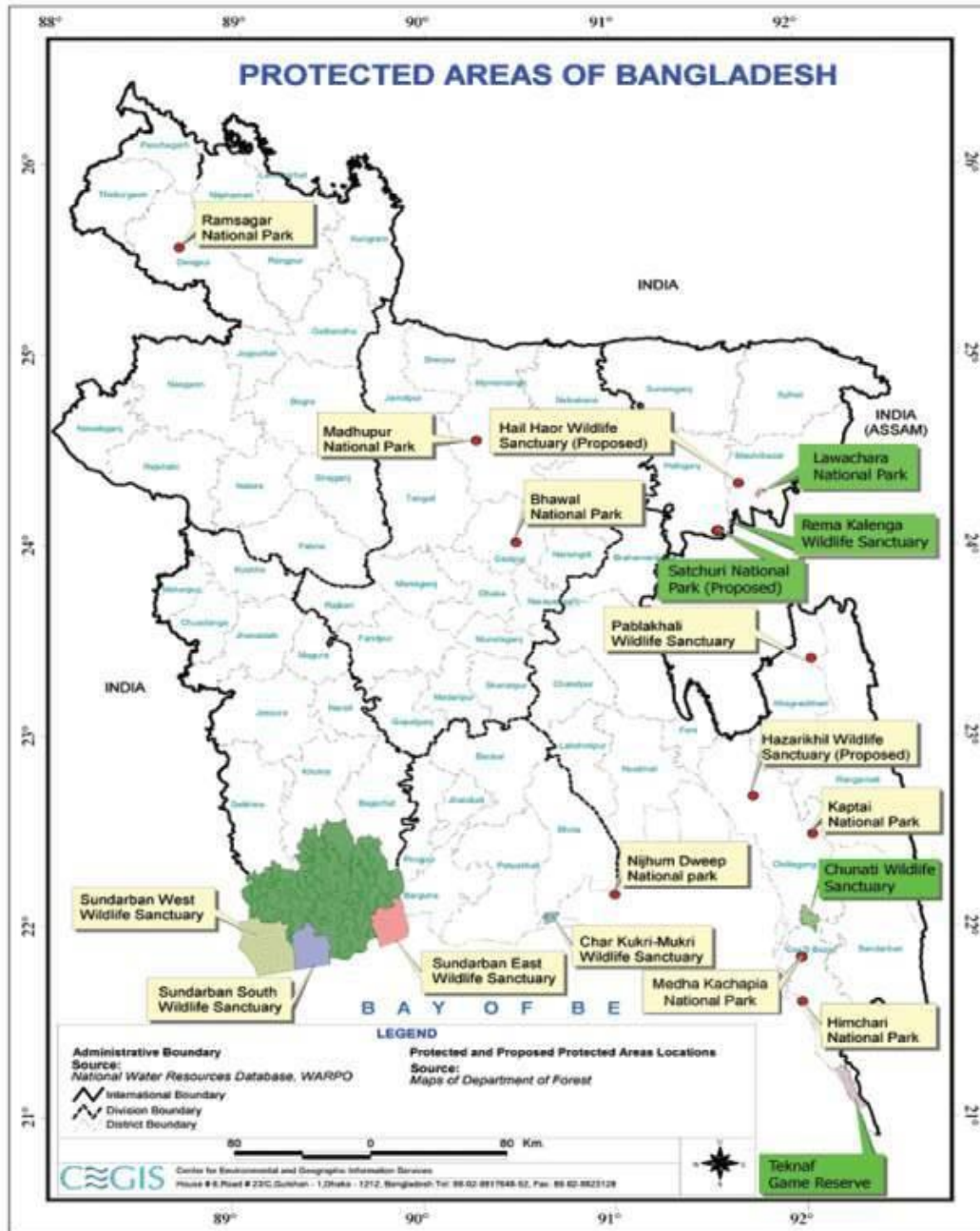
Ecologically Critical Areas (ECAs)	Total Area, (Ha)	Name of District	Name of Upazila	Name of Union/ Pourashava	Name of Mouza
			Teknaf	Teknaf, Bahar Chara and Sabrang	Teknaf (excluding Bazar and Border Check post), Silkhali, Sabrang, Shah Porar Deep (excluding border check post) and Bordayle
Saint Martin Deep (island)	590	Cox's Bazar	Teknaf	Saint Martin Deep (island)	Narikel Jinjira
Sonadia Deep (island)	4,916	Cox's Bazar	Moheshkhali	Kutubjum	Sonadia, Ghoti Bhangra (part)
Hakaluki Haor	18,383	Moulvi Bazar and Sylhet	Borolekha, Kulaura, Fenchuganj and Golapganj	Sujanagar, Barni, Talikpur, Poschimjuri, Jafarnagar, Boromchol, Boksimali, Vatera, Uttar Bade Pasa and Sharifganj	Water bodies, recorded as Beel in the register of Land Revenue Department, located in all Mouzas/part of Mouzas under the jurisdiction of Unions listed in the previous column.

Ecologically Critical Areas (ECAs)	Total Area, (Ha)	Name of District	Name of Upazila	Name of Union/ Pourashava	Name of Mouza
Tanguar Haor	9,727	Sunamganj	Taherpur and Dharmopasa	Uttar Srepur, Dokkhin Srepur, Uttar Bonsikundi and Dokkhin Bonshikundi	Water bodies, recorded as Beel in the register of Land Revenue Department, located in all Mouzas/part of Mouzas under the jurisdiction of Unions listed in the previous column.
Marjat Baor	200	Jhenaidah	Kaliganj	Water bodies, recorded as Beel in the register of Land Revenue Department, located in all Mouzas/part of Mouzas under the jurisdiction of Unions listed in the previous column.	Water bodies, recorded as Beel in the register of Land Revenue Department, located in all Mouzas/part of Mouzas under the jurisdiction of Unions listed in the previous column.
Buriganga River	Full portion	Dhaka			
Shitalakshya River	Full portion	Dhaka, Narayanganj, Gazipur			
Turag River	Full portion	Dhaka, Gazipur			

Ecologically Critical Areas (ECAs)	Total Area, (Ha)	Name of District	Name of Upazila	Name of Union/ Pourashava	Name of Mouza
Balu River	Full portion	Dhaka			

Annex 2: Protected Areas in Bangladesh

A	National Parks	Location	Area (ha)	Established
1	Bhawal	Gazipur	5,022	1974 / 1982
2	Modhupur	Tangail / Mymensingh	8,436	1962 / 1982
3	Ramsagar	Dinajpur	27.75	2001
4	Himchari	Cox's Bazar	1,729	1980
5	Lawachara	Moulavibazar	1,250	1996
6	Kaptai	Chittagong Hill Tracts	5,464	1999
7	Nijhum Dweep	Noakhali	16352.23	2001
8	Medha Kassapia	Cox's Bazar	395.92	2004
B	Wildlife Sanctuaries	Location	Area (ha)	Established
1	Rema-Kelenga	Hobiganj	1795.54	1996
2	Char Kukri-Mukri	Bhola	40	1981
3	Sundarban (East)	Bagerhat	31226.94	1960/1996
4	Sundarban (West)	Satkhira	71502.10	1996
5	Sundarban (South)	Khulna	36970.45	1996
6	Pablakhali	Chittagong Hill Tracts	42087	1962/1983
7	Chunati	Chittagong	7761	1986
C	Game Reserve	Location	Area (ha)	Established
1	Teknaf	Cox's Bazar	11615	1983



Protected and Proposed Protected areas locations in Bangladesh

Annex 3: List categories of Projects or Industries

Details of industries under various categories are mentioned below:

Green Category (described under item 46, Schedule I, page 3118 of ECR- 97& 60, Schedule I, page 3119 of ECR- 97):

- Assembling and manufacturing of TV, Radio, etc.
- Assembling and manufacturing of clocks and watches.
- Assembling of telephones.
- Assembling and manufacturing of toys (plastic made items excluded).
- Book-binding.
- Rope and mats (made of cotton, jute and artificial fibers).
- Photography (movie and x-ray excluded).
- Production of artificial leather goods.
- Assembling of motorcycles, bicycles and toy cycles.
- Assembling of scientific and mathematical instruments (excluding manufacturing) etc.

Orange A Category (described under Item 14 & 18, Schedule - 1, page 3120 of ECR –97 & 39, Schedule I, Page 3121):

- Weaving and handloom.
- Production of shoes and leather goods.
- Saw mill/wood sawing.
- Printing Press.
- Plastic & rubber goods (excluding PVC).
- Restaurant.
- Cartoon/box manufacturing/printing packaging.
- Cinema Hall.
- Dry-cleaning.
- Production of artificial leather goods (capital up to 5 hundred thousand Taka).
- Sports goods.
- Production of salt (capital up to 10 hundred thousand Taka).
- Agricultural machinery and equipment.
- Industrial machinery and equipment. etc

Orange B Category

- Spinning Mill

- Clothing, Sweater Manufacturing
- Aluminum products.
- Glue (excluding animal glue).
- Bricks/tiles.
- Lime.
- Plastic products.
- Processing and bottling of drinking water and carbonated drinks.
- Galvanizing.
- Perfumes, cosmetics.
- Flour (large).
- Carbon rod.
- Stone grinding, cutting, and polishing.
- Garments and sweater production.
- Fabric washing.
- Power loom.
- Construction, re-construction and extension of road (feeder road, local road).
- Construction, re-construction & extension of bridge (length below 100 meters) etc.

Red Category

- Fabric Dyeing and Pharmaceutical Raw Materials
- Industrial Estate
- Tannery.
- Formaldehyde.
- Urea fertilizer.
- Chemical dyes, polish, varnish, enamel.
- Power plant.
- All mining projects (coal, limestone, hard rock, natural gas, mineral oil, etc.)
- Cement.
- Fuel oil refinery.
- Artificial rubber.
- Paper and pulp.
- Sugar.
- Distillery.
- Fabric dyeing and chemical processing.
- Ship manufacturing.
- Tobacco (processing/cigarette/Biri-making).
- Metallic boat manufacturing.
- Wooden boat manufacturing etc.

For the PSDSP, the Project Management Unit (PMU) or the Project team made by the implementing agency for the individual sub-projects will be responsible for obtaining the ECC. Necessary actions will include:

- Liaison with DoE;
- Preparation of all required documentation, including any approvals required from other agencies;
- Submission of the application to DoE in a timely manner, such that no delay occurs to the award of contracts for construction;
- Attendance at meetings with the DoE;
- Undertaking any further actions required by DoE prior to issue of the ECC

Annex 4: Prescribed Proforma for Applying for Environmental Clearance Certificate

2.5.1.1.1.1.1 Director/Deputy Director

Department of Environment

Dhaka/ Chittagong/ Khulna/ Rajshahi (Bogra)/ Barisal/ Sylhet Division

Sir,

I do hereby apply for environmental clearance certificate (ECC) for my proposed industrial unit or project, or for the existing industrial unit or project, and enclose the required papers and furnish all information as follows:

1.(a)	Name of the industrial unit or project:	
(b)	Location of the industrial unit or project:	
(c)	Address of present office:	
2.(a)	Proposed industrial unit or project:	
(a.a)	Expected starting date of construction:	
(a.b)	Expected completion date of construction:	
(a.c)	Expected trial production/operation starting date of industrial unit/project:	
2.(b)	Existing industrial unit or project:	

(b.a) Expected trial production/operation starting date of industrial unit/project:

3 Name of the product and quantity to be produced (daily/monthly/yearly):

4.(a) Name of raw materials and quantity required (daily/monthly/yearly):

(b) Source of raw materials:

5(a) Quantity of water to be used daily:

(b) Source of water :

6.(a) Name of fuel and quantity required (daily/monthly/yearly) :

(b) Source of fuel :

7. (a) Probable quantity of daily liquid waste :

(b) Location of waste discharge :

(c) Probable quantity of daily emission of gaseous substance :

(d) Mode of emission of gaseous substance:

	<p>8 Mouza (village) map indicating "Daag" (plot) number and "Khatiyān" number :</p>	
	<p>9 Approval of Rajdhani Unnayan Katripakkhya/Chittagong Development Authority/Khulna Development Authority/Rajshahi City Corporation/Barisal City Corporation/Sylhet City Corporation/Concern Pourashava/ Union Parishad, etc :</p>	
	<p>10.(a) Design and time schedule of proposed effluent treatment plant (ETP) :</p> <p>(b) Fund allocated:</p> <p>(c) Area :</p>	
	<p>11 Process flow diagram :</p>	
	<p>.(a) Location map of industrial unit or project :</p> <p>(b) Layout plan with location of ETP :</p>	
	<p>(a) Initial environmental examination (IEE)/ environmental impact assessment (EIA) report, if applicable:</p> <p>(b) Environmental management plan (EMP), if applicable:</p>	

(c) Feasibility report, if applicable:	
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Signature of the entrepreneur

Seal

Name :

Address

Phone :

Date :

Declaration

I do hereby declare that all information provided by me in this application are true to the best of my knowledge and no information has been concealed or distorted herein.

(Name and signature of the entrepreneur)

Annex 5: Concern Authority for Issuing Environmental Clearance Certificate or Renewal

<u>Type of project</u>	<u>Divisional Officer of Department of Environment</u>
Green/Orange-A	Director/ Deputy Director, Dhaka/ Chittagong/ Khulna/ Rajshahi / Sylhet / Barisal
Orange-B/Red	Director/ Deputy Director, Dhaka/ Chittagong/ Khulna/ Rajshahi/ Sylhet/ Barisal (upon approval from Director General, DOE, Dhaka)

Annex 6: Fees for Environmental Clearance Certificate or Renewal

	Investment (in Taka) for the industrial unit or project	Fees for ECC, Taka	Renewal Fee, Taka
A.	Tk.1,00,000 and 5,00,000	Tk.1, 500	Tk.375
B.	Tk.5,00,000 and 10,00,000	Tk.3, 000	Tk.750
C.	Tk.10,00,000 and 50,00,000	Tk.5, 000	Tk.1, 250
D.	Tk.50,00,000 and 10,000,000	Tk.10, 000	Tk.2, 500
E.	Tk.10,000,000 and 2,00,000,000	Tk.25, 000	Tk.6, 250
F.	Tk.2,00,000,000 and 5,00,000,000	Tk.50, 000	Tk.12, 500
G.	Above Tk.5,00,000,000	Tk.1, 00,000	Tk.25,000

Annex 7: Standards Set by DoE for Effluent (waste water) from Industrial Units or Projects Waste

Sl. No	Parameter	Unit	Places for determination of standards		
			Inland surface water	Public sewerage system connected to treatment at second stage	Irrigated land
1	Ammonical nitrogen as elementary N	mg/L	50	75	75
2	Ammonia as free ammonia	"	5	5	15
3	Arsenic	"	0.2	0.05	0.2
4	BOD at 20°C	"	50	250	100
5	Boron	"	2	2	2
6	Cadmium	"	0.5	0.05	0.05
7	Chloride	"	600	600	600
8	Chromium as total Cr	"	0.5	1	1
9	COD	"	200	400	400
10	Chromium as hexavalent Cr	"	0.1	1	1
11	Copper as Cu	"	0.5	3	3
12	Dissolved oxygen (DO)	"	4.5-8.0	4.5-8.0	4.5-8.0

Sl. No	Parameter	Unit	Places for determination of standards		
			Inland surface water	Public sewerage system connected to treatment at second stage	Irrigated land
13	Electrical conductivity (EC)	micro mho/cm	1,200	1,200	1,200
14	Total dissolved solids	mg/L	2,100	2,100	2,100
15	Fluoride as F	"	2	15	10
16	Sulfide as S	"	1	2	2
17	Iron as Fe	"	2	2	2
18	Total nitrogen as N	"	100	100	100
19	Lead as Pb	"	0.1	1	0.1
20	Manganese as Mn	"	5	5	5
21	Mercury as Hg	"	0.01	0.01	0.01
22	Nickel as Ni	"	1	2	1
23	Nitrate as elementary N	"	10	Not yet fixed	10
24	Oil and grease	"	10	20	10
25	Phenolic compounds as C ₆ H ₅ OH	"	1	5	1
26	Dissolved phosphorus as P	"	8	8	10

Sl. No	Parameter	Unit	Places for determination of standards		
			Inland surface water	Public sewerage system connected to treatment at second stage	Irrigated land
27	Radioactive substance	"	To be specified by Bangladesh Atomic Energy Commission		
28	p ^H		6-9	6-9	
29	Selenium as Se	mg/L	0.05	0.05	0.05
30	Zinc as Zn	"	5	10	10
31	Total dissolved solids	"	2,100	2,100	2,100
32	Temperature	°C			
	Summer		40	40	40
	Winter		45	45	45
33	Total Suspended solids (TSS)	mg/L	150	500	200
34	Cyanide as CN	"	0.1	2	0.2

Note 1: The above standards are applicable to all industries or projects other than those specified for sector-wise standards.

Note 2: Compliance with these standards to be ensured from the moment an industrial unit starts trial production, and in other cases, from the moment a project starts operation.

Note3: Inland surface water means drains/ ponds/tanks/water bodies/ ditches/canals/rivers/ springs and estuaries.

Note 4: Public sewerage system means treatment facilities of the first and second stage

and also combined and complete treatment facilities.

Note 5: Irrigated land means land area, which is sufficiently irrigated by waste water for cultivation of selected crops.

Annex 8: Standards Set by DoE for Gaseous Emission from Industries or Projects

Sl. No.	Parameter	Standard present in a unit of mg/Nm ³
1	Particulate	
	a) Power plant with capacity of 200 Megawatt or above	150
	b) Power plant with capacity less than 200 Megawatt	350
2	Chlorine	150
3	Hydrochloric acid vapour and mist	350
4	Total fluoride F	25
5	Sulphuric acid mist	50
6	Lead particulate	10
7	Mercury particulate	0.2
8	Sulphur dioxide	
	a) Sulphuric acid production (double conversion, double absorption process)	4 kg/ton
	b) Sulphuric acid production (single conversion, single absorption process)	10 kg/ton
	Lowest height of stack for dispersion of sulphuric acid (in meter)	
	a) Coal based power plant	
	1) 500 Megawatt or above	275 kg/ton
	2) 200 to 500 Megawatt	220 kg/ton
	3) Less than 200 Megawatt	14 (Q) ^{0.3} kg/hour
	b) Boiler	
	1) Steam per hour up to 15 tons	11 kg/ton
	2) Steam per hour more than 15 tons	14 (Q) ^{0.3} kg/hour
	Note : Q = Emission of sulphur dioxide , kg/hour	
9	Oxides of nitrogen	

Sl. No.	Parameter	Standard present in a unit of mg/Nm ³
	a) Nitric acid production	3 kg/ton
	b) Gas fuel based power plant	
	1) 500 Megawatt or above	50 ppm
	2) 200 to 500 Megawatt	40 ppm
	3) Below 200 Megawatt	30 ppm
	c) Metallurgical oven	200 ppm
10	Soot and dust particles	
	a) Air ventilated furnace	500 mg/Nm ³
	b) Brick-field	1000 mg/Nm ³
	c) Coke oven	500 mg/Nm ³
	d) Lime kiln	250 mg/Nm ³

Annex 9: Standards Set by DoE for Sound

Sl. No.	Category of areas	Standards determined at dBa unit	
		Day	Night
1	Silent zone	45	35
2	Residential area	50	40
3	Mixed area (mainly residential area, and also simultaneously used for commercial and industrial purposes)	60	50
4	Commercial area	70	60
5	Industrial area	75	70

Note 1: The time from 6 a.m to 9 p.m is counted as day time.

Note 2: The time from 9 p.m to 6 a.m is counted as night time.

Note 3: Area up to a radius of 100 meters around hospitals or educational institutions or special institutions/establishments identified/to be identified by the Government is designated as Silent Zones where use of horns of vehicles or other audio signals, and loud speakers are prohibited.

Annex 10: Standards Set by DoE for Odor

Parameter	Standards Limit (ppm)
Acetaldehyde	0.5-5
Ammonia	1-5
Hydrozine sulphide	0.02-0.2
Methyl disulphide	0.009-0.1
Methyl mercaptan	0.02-0.2
Methyl sulphide	0.01-0.2
Styrene	0.4-2.0
Tri methylamine	0.005-0.07

Note 1: Following regulatory limit shall be generally applicable to emission/exhaust outlet pipe of above 5 meter height:

$$Q = 0.108 \times He^2 \times Cm \text{ (Where } Q = \text{ Gas Emission rate } Nm^3/\text{hour)}$$

Here,

Q = gas exhaust rate in Nm^3 /hour

He = height of exhaustal pipe in meter (m)

Cm = standard limit mentioned above (ppm)

Note 2: In case where limits of quality standard have been specified, the lower limit for purpose of warning and the higher for legal proceedings or penal action shall be used.

Annex 11: World Bank Safeguard Policies (at a glance)

Policy	Summary of core requirements	Applicability to lending instruments	Public Consultation	Explicit provision for exceptions
OP/BP 4.01, Environmental Assessment	Screen early for potential impacts and select appropriate instrument to assess, minimize, and mitigate potentially adverse impacts.	All investment projects. Applicable to sector adjustment loans.	Consult affected groups and NGOs as early as possible (for Category A and B projects).	Yes. For emergency recovery operations with approval of the Regional VP, ENV Chair, and LEG.
OP/BP 4.04, Natural Habitats	Do not finance projects that degrade or convert critical habitats. Support projects that affect noncritical habitats only if no alternatives are available and if acceptable mitigation measures are in place.	All investment projects.	Consult local people in planning, designing, and monitoring projects.	NO
OP/4.09, Pest Management	Support integrated approaches to pest management. Identify pesticides that may be financed under the project and develop appropriate pest management plan to address risks.	All investment projects and adjustment operations.	Consult local people in planning, designing, and monitoring projects	NO

Policy	Summary of core requirements	Applicability to lending instruments	Public Consultation	Explicit provision for exceptions
OP 4.36, Forestry	Support sustainable and conservation-oriented forestry. Do not support commercial logging in primary moist tropical forests.	All investment projects.	Consult local people, the private sector, and interest groups in forest area	NO
OP/BP 4.37, Safety of Dams	For large dams, carry out technical review and periodic safety inspections by independent dam safety professionals.	All investment projects.	No public consultation	NO
OP/BP 7.50, Projects in International Waterways	Ascertain whether riparian agreements are in place, and ensure that riparian states are informed of and do not object to project interventions.	All investment projects.	No Public consultations. Riparian notification required	NO
OP/BP 7.60, Projects in Disputed Areas	Ensure that claimants to disputed areas have no objection to proposed project.	All investment projects.	No Public consultations. Claimants informed	NO

Annex 12: Effluent Discharge Requirements of World Bank

Type of project	Parameter	Maximum values
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2.5.1.1.2 General manufacturing	p ^H	6-9
	BOD ₅	50
	COD	250
	TSS	50
	Oil and grease	10
	Phenol	0.5
	Cyanide	Total: 1 ; Free: 0.1
	Nitrogen	10 as ammonia
	Phosphorus	2
	Fluorine	20
	Chlorine	0.2
	Coliform	400 MPN/100 ml
	Temperature increase	≤ 3° C
	Sulfide	1
	Silver	0.5
	Arsenic	0.1
	Cadmium	0.1
	Chromium ⁺⁶	0.1
	Chromium	0.5
	Iron	3.5

	Mercury	0.01
	Nickel	0.5
	Lead	0.1
	Zinc	2
	Selenium	0.1
	Total metals	10
2.5.1.1.2.1 Electronic manufacturing	p ^H	6-9
	BOD	50
	TSS	50 (max.); 20 (monthly average);
	Oil and grease	10
	Cyanide	0.1 (free); 1 (total)
	Nitrogen	10 as ammonia
	Phosphorus	5
	Total chlorocarbons and hydrocarbons	0.5 (total)
	Fluoride	20
	Arsenic	0.1
	Cadmium	0.1
	Chromium ⁺⁶	0.1
	Copper	0.5
	Mercury	0.01

Nickel	0.5
Lead	0.1
Tin	2
Metal, total	10

Note: all units are in mg/l, except pH and otherwise specified)

BOD₅: Biochemical oxygen demand (measured over 5 days)

COD: Chemical oxygen demand

TSS: Total suspended solids

MPN/100 ml: Coliform count expressed as most probable number per 100 milliliters

Annex 13: Emission Discharge Requirements: Parameters and Maximum Values, (mg/Nm³, unless otherwise specified) by World Bank

Type of project	Parameter	Maximum values
<i>General manufacturing</i>	PM	50 for ≥ 50 Mwe ; 100 < 50 Mwe
	SO _x	2,000 as sulphur dioxide
	NO _x	750 (260 ng/J or 365 ppm) for coal
		460 (130 ng/J or 225 ppm) for oil
		320 (86 ng/J or 155 ppm) for gas
	Dioxins: 2,3,7,8-TCSS equivalent	1 ng/J maximum
<i>Thermal power, new plants</i>	PM	50 for > 50 MWe ; 100 for < 50 Mwe
	SO _x	0.2 tpd/Mwe (to 500 Mwe) ; 0.1 tpd/Mwe (over 500 Mwe) ; Not to exceed 2,000 mg/Nm ³ in flue gases ; Not to exceed 500 tpd
	NO _x	Thermal Power Plant - Coal : 750 (260 ng/J or 365 ppm) ; Oil : 460 (130 ng/J or 225 ppm) ; Gas : 320 (86 ng/J or 155 ppm)
		Combustion turbine Unit - Gas : 125 ; Diesel fuel (No.2 oil) : 165 ; Fuel oil (No.6 and other) : 300
		Coal with < 10% volatile matter NO _x is 1,500 mg/Nm ³
<i>Thermal power plant,</i>		100 ; In rare cases, 150 mg/Nm ³ is

<i>rehabilitation</i>	PM	acceptable
<i>Electronic manufacturing</i>	VOCs	20
	Phosphine	1
	Arsine	1
	Hydrogen fluoride	5
	Hydrogen chloride	10

Note: PM: Particulate matter

SOx: Sulphur oxides

NOx: Nitrogen oxides

Mwe: Megawatts of electricity

ng/J: Nanograms per joule

ppm: Parts per million

tpd: Metric tons per day

VOCs: Volatile organic compounds

Annex 14: Noise Level Requirements: Receptors and Maximum Limits by World Bank

Type of Project	Receptor	Maximum allowable log equivalent (hourly measurements), dB (A)	
		Day (07:00-22:00)	Night (22:00-07:00)
<i>Thermal power plant</i>	Residential		
	Institutional		
	Educational	55	45
	Industrial		
	Commercial	70	70
<i>Electronic manufacturing</i>	Residential		
	Institutional		
	Educational	55	45
	Industrial		
	Commercial	70	70

Source: *Pollution Prevention and Abatement Handbook, World Bank, 1998*

Note 1: dB (A) Decibels measured on the A scale

Note 2: Noise abatement measures should achieve either the levels given above or a maximum increase in background levels of 3 decibels (measured on the A scale) [dB (A)]. Measurements are to be taken at noise receptors located outside the project property boundary.

Annex 15: Environmental Impacts and Mitigation Measures

1. IMPACT ANALYSIS AND MITIGATION MEASURES

1.1 Purpose

One of the purposes of the EMF is to provide a common and consistent reference point for multiple projects with a view to avoid and/or minimize adverse impacts and to mitigate them through an Environmental and Social Impact Assessment as the basis for preparing and updating Resettlement Action Plan and where required, an Indigenous Peoples' Development Plan. In order to achieve this, the main provisions are:

- Provision of modalities to perform alternative analysis of options to avoid, and where avoidance is not possible, minimize the need for land acquisition;
- Provision of modalities to mitigate adverse environmental, social, economic and cultural impacts;
- Provision of a framework for consistence of approach between different Project sites; and
- Provision of an approach for Project sites that will be developed in the future for which the determination of exact impact cannot be known in advance.

This section gives a broad overview of the probable impacts that might occur during the project implementation and execution, including a general indication of the seriousness or significance of potential impacts. It also discusses the possible mitigation measures that can be put in place to mitigate any negative impacts and enhance the positive ones.

At the outset, potential adverse environmental and social impacts and mitigation measures are outlined to give an impression of the nature and magnitude of the impacts and mitigation measures that can be associated with the project. In doing so, it depicts the scope of environmental and social management measures that may be required for the project.

1.2 Potential Impacts

Potential significant environmental impacts from the development of the PSDSP subprojects have been identified with respect to the major activities to be carried out which include:

- Land Development
- Infrastructure development and
- Operational phase of the project.

Considering the interaction between engineering operations and activities and the

environment and social considerations, the impacts occurring in the following three phases are considered:

- Pre – Construction (Planning and Design)
- Construction
- Operation & Maintenance

It is recommended that the impact assessment measures the performance during all the three phases against the baseline position.

1.3 Pre-Construction (Planning and Design)

1.3.1 *Impact on Environmentally Sensitive Areas*

The location of the zone / industry in an environmentally sensitive area such as a wildlife sanctuary, game reserve, protected wetland, forest or area of cultural importance has the potential to cause adverse impacts. Table I presents the framework for assessing the sensitivity of a sub-project depending upon its location. As indicated in the table, zone / industry in medium and high sensitive areas shall be excluded from the project through the screening process of the safeguard due diligence exercise.

Table I: Site Location and Sensitivity

Environmental Issues	Low Sensitivity	Medium Sensitivity	High Sensitivity
Natural Habitats	No critical natural habitats; no other natural habitats	No critical natural habitats; other non-forest natural habitats present	Critical natural habitats [Critical natural habitats are defined as existing and proposed protected areas] along with unprotected natural habitats of known high importance for biodiversity conservation.
Resettlement	Low population density; dispersed population; no or	Medium population density; settlements; some roadside	High population density; major towns and villages; intensive

Environmental Issues	Low Sensitivity	Medium Sensitivity	High Sensitivity
	little roadside activities or well-established businesses and legal tenure along right of way.	activity; mixed ownership and land tenure along right of way.	roadside activity; low income families and illegal ownership of land in and along right of way; communal properties
Induced Development	Area or region is well consolidated; dense road network	Medium density road network; open lands are still available	Area or region is undeveloped; road network is incipient or non-existent
Soil Stability / Erosion	Flat terrain; no potential erosion problems.	Medium slopes; some erosion potential	Mountainous terrain; high slopes; unstable soil formations; high erosion potential
Cultural Heritage	No known or suspected cultural heritage sites	Suspected cultural heritage sites; known heritage sites in area of influence; Cultural sites of particular importance to indigenous or minority groups or of unique nature	Known heritage sites along the right of way Cultural sites that are of key social importance and access to which may be imperiled Loss of access to cultural sights of significance for resettled people

1.4 Land Acquisition

The acquisition of private land and transfer of Government land to a Project will have direct economic and social impacts and results in loss of homesteads causing resettlement, loss of productive assets or access to such assets and also loss of income sources or means of livelihood, whether or not affected persons needs to be resettled.

Land acquisition and transfer of Government land are also likely to affect common resources, such as water bodies, and common properties such as Mosques on which people

depend to meet their social, economic and cultural needs.

The four broad categories of economic, social and cultural impacts resulting due to the projects that would be required to be mitigated are:

- Loss of homestead land and shelter;
- Loss of productive assets or access to such assets
- Loss of sources of income or means of livelihood
- Loss of common resources and properties

1.5 Construction Phase

Generally, construction impacts are expected to affect the environment for a relatively short time period and these are expected to cease soon after the completion of construction. The potential major impacts are described herein:

a. Flora & Fauna

The construction of buildings and other infrastructure could result in clearing and depletion of vegetation that will result in loss of plant cover, disturbance and loss of fauna habitats, weakening and degradation of soils, disturbance of the natural landscape and disfiguring of the natural morphology.

b. Soil and Land Degradation

Earthmoving equipments such as excavators are likely to be used in cutting/excavation works. These equipments may expose the soil to erosion and also compact it and may break down the soil structure which may potentially decrease the drainage of the areas. Furthermore, the risk of accidental discharge of hazardous products, leakage of hydrocarbons, oils or grease from construction machinery also constitute potential sources of soil and water pollution.

c. Vehicular Traffic

Construction work may result in a high traffic volume within the area. Wastes generated from project activities such as cement bags, paint drums and debris may result in pollution and constitute obstructions to vehicular traffic. The transport of raw materials may introduce a number of heavy trucks on the access road and this could increase the risk of motor accidents and result in vehicular-pedestrian conflicts.

d. Waste Management

Activities at construction sites may produce construction wastes such as excavated soils and debris. Excavated wastes could obstruct the general public, the movement of the workers and vehicles as well as cause public health issue if contamination is allowed. In addition, unmanaged waste can have a significant indirect economic impact by reducing the price of properties nearby and in general, by affecting the aesthetics, child- friendliness and the overall condition of the environment.

e. Slope, erosion and drainage

If the topography of the project area is hilly, erosion problems during construction are likely to be more severe, as compared to a flat area. However, if the area is flat, water may not drain away easily, in general, and stagnant pools of water may get created. These pools, if not drained regularly may provide favorable breeding grounds for mosquitoes.

f. Air Quality

Air quality will be impacted by emissions from vehicles, earthmoving equipment and released particulate matter.

g. Water Quality

Water quality may be impacted by wastewater discharge from construction activities. These will include discharge from onsite sewage system and rainwater run-off. The discharge of this wastewater into surface water may impact water quality by causing changes to its physical, chemical and biological properties.

Given the high anticipated volume of waste/spoil that may be generated, it is likely that the waste may get stockpiled on road sides. If it is not properly contained, rains could carry it along with runoff into other surface waters, leading to increased turbidity and siltation. This could affect aquatic resources such as fisheries etc.

h. Occupational, Health and Safety

The health and safety of the local population may be at risk during the construction activities. The movement of trucks to and from the site, the operation of various equipment and machinery and the actual construction activities may expose the workers to work-related accidents and injuries. Pollutants such as dust and noise could also have negative

implications on the health of workers and near-by communities.

1.6 Operation and Maintenance Phase

Operational impacts continue during the life of the project after the completion of construction phase and may last for a longer time. Operation of industries emits a number of pollutants that need to be carefully mitigated and monitored. Main pollutants during the operation phase are as follows:

a) Liquid Wastes (see Annex 6 for DOE wastewater discharge standards)

- Process Water from the industries
- Domestic Sewage
- Oils & Grease
- Contaminated Water
- Solvents

b) Solid Wastes

- Packaging materials
- Raw material residues
- Container residues
- Scrap metals
- Sludge containing various toxic metals

c) Air Emission (see Annex 7 for DOE gaseous emission standards)

- Smoke
- Volatile organic compounds
- Particulates
- Oxides of Nitrogen
- Sulphur dioxide
- Carbon Dioxide

d) Noise (see Annex 8 for DOE noise emission standards)

- Use of machineries

e) Health & Safety

- Water pollution hazards
- Potential Fire Hazards
- Handling of Chemicals

- Heat Generation
- Air pollution hazards

f) Smell (see Annex 9 for DOE odor standards)

- Effluent discharge
- Use of chemicals

g) Visual impact

- Construction of industries and buildings
- Smoke

2. MAJOR ENVIRONMENTAL IMPACTS

Table II gives an overview of the major environmental impacts resulting from the preconstruction, construction and operation of PSDSP.

Table II: Major Environmental Impacts

SL	Parameters	Impacts
1	Soil	<ul style="list-style-type: none"> ▪ Possible increase in soil erosion as a result of the construction activities (clearing of vegetation and soil excavation) ▪ Loss of productive topsoil resulting from site clearance ▪ Soil contamination resulting from the release of chemicals (lubricant, fuel, paint) from the machinery
2	Water	<ul style="list-style-type: none"> ▪ Run-off erosion may occur from unprotected excavated areas during heavy rain resulting to sedimentation of the nearby water-bodies ▪ Potential pollution of the water bodies through run-off of hazardous construction waste (lubricants, cements, paint and fuels) ▪ Contamination of surrounding water bodies through improper disposal of industrial effluent and sewage during operation ▪ Possible run off from the temporary solid waste storage site into the drainage system (during the project operational phase)
3	Ecosystem	<ul style="list-style-type: none"> ▪ Destruction of vegetation, loss of habitat and loss of biodiversity ▪ Possible loss of endangered and rare species

		<ul style="list-style-type: none"> ▪ Change in land use and disturbance of ecosystem ▪ Contamination of biota
4	Air	<ul style="list-style-type: none"> ▪ Particulate matters emission from construction activities ▪ Emission of pollutants (NO_x, SO_x, CO) from the construction ▪ Machineries ▪ Possible release of micro organisms to the air during the operational phase of the project
5	Noise	<ul style="list-style-type: none"> ▪ Construction equipment will generate noise above the usual level
6	Landscape	<ul style="list-style-type: none"> ▪ Change in natural drainage pattern ▪ Destruction of vegetation and trees ▪ Deforestation and desertification ▪ Visual impact

3. ASSESSMENT OF IMPACTS

This section contains a discussion of the possible environmental effects of the PSDSP sub-projects for the specific issue areas that were identified as having the potential to experience significant impacts. “Significant effect” can be defined as ‘a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.’

An economic or social change by itself shall not be considered a significant effect on the environment, but may be considered in determining whether the physical change is significant.” In the impact analysis, significance thresholds are those criteria which are universally recognized, or are developed specifically for a single project analysis to determine whether potential effects are significant.

Environmental impacts of the sub-projects can broadly be classified as those taking place during pre-construction, construction and operational phases. The overall strategy has the following sequence:

Types of Impacts are grouped into four classes. These are:

i) **Class I Significant and Unavoidable:**

An impact that cannot be reduced to below the threshold level given reasonably

available and feasible mitigation measures. Significance thresholds are those criteria which are developed specifically to determine whether potential effects are significant.

ii) **Class II Significant but Mitigable:**

An impact that can be reduced to below the threshold level given reasonably available and feasible mitigation measures.

iii) **Class III Not Significant:**

An impact that may be adverse, but does not exceed the threshold levels and does not require mitigation measures. However, mitigation measures that could further lessen the environmental effect may be suggested if readily available and easily achievable.

iv) **Class IV Beneficial:**

An effect that would reduce existing environmental problems or hazards.

In those cases where the mitigation measure for an impact could have a significant environmental impact in another issue area, this impact is discussed as a residual effect. The impact analysis concludes with a discussion of cumulative impacts, which evaluates the impacts associated with the proposed project in conjunction with other future development in the area.

3.1 Cumulative Impacts

Cumulative impacts can be defined as impacts, which potentially develop from the combined impacts of more than one project or large scale program occurring within the same area of influence and time span. In such cases, cumulative impacts will have to be assessed based on the combined effects of potential impacts from the various program inputs. The cumulative impacts may occur due to the following environmental parameters:

- Change in Land use
- Traffic
- Industrial Wastewater Effluent
- Solid Waste Disposal
- Noise

4. MITIGATION MEASURES

This section includes the principles, procedures and mitigation measures that are relevant

and suitable to the project for ensuring the most appropriate environmental mitigation and enhancement plans applicable during different stages of project implementation. To avoid and minimize the impacts resulting from the activities of different sub-projects, measures/management plans, which are essential to mitigate the impacts as discussed, are based upon appropriate technological design, improvements or adjustments, and policy including good site operational practices.

Table III highlights the actions/procedures to avoid/minimize /control the resultant impacts arising out of the different project phases i.e. pre-construction, construction and operation. Based on the specific nature of the project and its potential impacts, the table may be modified as appropriate.

Table III: Mitigation Measures

Issue	Mitigation Measure	Time Frame	Responsibility	
			Implementation	Supervision /Monitoring
A. CONSTRUCTION PHASE				
a) Soil				

Issue	Mitigation Measure	Time Frame	Responsibility	
			Implementation	Supervision /Monitoring
Disposal from excavated earthworks	<ul style="list-style-type: none"> Earthwork cuts will be used where possible Residual spoil will be disposed of according to the erosion prevention plan 	During Construction	Developer	ESC
Loss of Top Soil	<ul style="list-style-type: none"> Topsoil from all areas to be permanently covered shall be stripped, stored and used for re-vegetation works; Construction vehicles, machinery, and equipment shall move or be stationed in designated areas. Access to adjacent agricultural land will be minimized 	During Construction	Developer	ESC
Soil erosion and Water Pollution	<ul style="list-style-type: none"> Measures as per design or as directed by the Consultants to control soil erosion. Earth materials and stone will be properly disposed of so as not to block rivers, resulting in adverse impact on water quality. Measures will be taken to prevent earth works Mitigation measures will be taken to prevent the untreated wastewater produced in construction from entering into creek and streams 	During Construction	Developer	ESC
b) Water Resources				
Siltation of water bodies	<ul style="list-style-type: none"> Measures to prevent erosion will be taken in accordance with the erosion prevention plan 	During Construction	Developer	ESC
Contaminated runoff from inappropriately stored hazardous materials	<ul style="list-style-type: none"> Solid hazardous and non hazardous wastes will be appropriately stored to prevent contaminated runoff to adjacent waterways 	During Construction	Developer	ESC
c) Air Quality				
Generation of Dust	<ul style="list-style-type: none"> Water will be sprayed on construction sites, exposed sites and earth roads to minimize dust; Concrete batching plants and crushing plants will be sited at least 500 m from the nearest habitation and fitted with dust extraction units in compliance with national air quality standards 	During Construction	Developer	ESC

Issue	Mitigation Measure	Time Frame	Responsibility	
			Implementation	Supervision /Monitoring
Emissions from construction vehicles, equipment and machinery	<ul style="list-style-type: none"> All emissions will meet standards. Developer will submit dust suppression program before construction 	During Construction	Developer	ESC
d) Noise Quality				
Noise from vehicles, plant, and earth moving equipment	<ul style="list-style-type: none"> Within 200 m of the nearest habitation, construction work will be restricted to between 0600 to 2100 hours. Maintenance of machinery and vehicles should be enhanced to keep their noise within acceptable level 	During Construction	Developer	ESC
e) Impact on Flora				
Loss of or damage to Vegetation	<ul style="list-style-type: none"> Minimum damage or disruption to the flora. Trees or shrubs will be removed that impinge directly on the permanent works or necessary temporary works. 	During Construction	Developer	ESC
f) Impact on Fauna				
Loss or Damage or Disruption of Fauna	<ul style="list-style-type: none"> All works are to be carried out in such a fashion that the damage or disruption of the fauna is minimum. 	During Construction	Developer	ESC
g) Waste Management				
Generation of Solid wastes	<ul style="list-style-type: none"> Solid waste generated to be accumulated at one place and treated. 	During Construction	Developer	ESC
B. OPERATION & MAINTENANCE PHASE				
Industrial Effluent	<ul style="list-style-type: none"> All recommendations on ESMP shall be implemented. All industrial effluent will be directed to central effluent treatment plant before disposal Industrial Effluent will be treated to applicable standards 	Throughout Operation Period	Enterprise /Developer	ESC and DOE

Issue	Mitigation Measure	Time Frame	Responsibility	
			Implementation	Supervision /Monitoring
Air Emission	<ul style="list-style-type: none"> All recommendations of ESMP shall be implemented. Suitable dust collectors (bag filters) shall be provided at all major emission source. For dispersion of the hot air from boiler stack, it is recommended that the height of the stack chimney should be at least 2.5 times of the nearest height of the building The effluents will be treated to applicable standards 		Enterprise /Developer	ESC and DOE
Noise	<ul style="list-style-type: none"> All recommendations of ESMP shall be implemented. Proper design and sound management practice will be adopted The noise emission shall conform to applicable standards Green belts as sound barriers shall be established. Monitoring will be conducted during the operational phase to confirm noise-modeling results. 	Throughout Operation Period	Enterprise /Developer	ESC and DOE
Solid Waste	<ul style="list-style-type: none"> All materials will be disposed through central solid waste management system 	Throughout Operation Period	Enterprise /Developer	ESC and DOE
Occupational Health	<ul style="list-style-type: none"> Occupational, Health and Safety Program will be adopted. Review and evaluate to improve the effectiveness of Environmental Health and Safety Program 	Throughout Operation Period	Enterprise /Developer	ESC and DOEs

Annex 16: Environmental Specifications for Bid Documents

It is recommended that, bare minimum; the following clauses are incorporated in the bid document:

- The developer shall take all steps to protect the environment and avoid damage and nuisance arising because of his operations.
- The developer shall comply with all statutes and regulations concerning the execution of works as per the DoE and donor's environmental guidelines.
- The developer shall be responsible for familiarizing himself with all legislation relating to environmental protection that is relevant to his activities. Reference to global best practices and local environmental guidelines should be made.
- The developer shall be responsible for bearing the costs of cleaning up any environmental pollution resulting from his activities.
- In case of surface water pollution from developer's activities, the developer shall take adequate preventive measures for not doing so and in case pollution of surface water occurred the developer shall be liable to make the water to its original quality especially where the surface water has potential use. Costs including both for the tests and purification shall be borne by the developer.
- Where water abstraction from boreholes by the developer results in adverse effects on groundwater, which at the time of commencement of the contract was being used by the local people, the developer shall arrange supply of equivalent quantity of safe water to the users as before.
- The developer shall, at all times, maintain all sites under his control in clean and tidy condition and shall provide appropriate and adequate facilities for temporary dumping of all wastes before disposal.
- The developer shall be responsible for safe transportation and disposal of all wastes generated out of his activities in such a manner so that environmental pollution or hazards to health in any form is within prescribed limits. In the event of any third party being employed to dispose of wastes, the developer shall be considered to have discharged his responsibilities under this Clause from the time the wastes leave sites under his control, providing that he has exercised due diligence in ascertaining that the proposed transport and disposal arrangements such as to not cause pollution or health hazards.
- The developer shall not allow waste oils, lubricant or other petroleum derived wastes to be used as dust suppressants and that all reasonable precautions shall be taken to prevent accidental spillage of petroleum products, their contact with soil or discharge into water courses.
- The developer shall be responsible for the provision of adequate sanitary facilities for the construction workforce (including those employed under subcontracts) at all construction, office and camp sites. The developer shall not knowingly allow discharge of any untreated sanitary wastes either to groundwater or surface water.

Before mobilization of the construction workforce, the developer shall provide details of sanitary and drainage arrangements to the Engineer for approval. The detail should include maintenance and operation plants and generally be sufficient to allow the Engineer to assess whether the proposed facilities are adequate.

- All vehicles and plant operated by the developer (or his appointed contractors) shall be maintained according to the original manufacturers' specifications and manuals, with particular regard to the control of noise and/or smoke emissions. The construction supervision consultant shall have the right to require the developer to replace or rectify any vehicle or plant that he thinks emits excessive noise and/or smoke, within 48 hours of notice in writing.
- The developer shall make reasonable effort to reduce noise nuisance caused by construction activities, including location of crusher and ancillary plants in locations where the distance between those plants and residential areas is such that it results in attenuation of noise at existing residential areas.
- The developer shall take all reasonable measures to minimize dust-blow arising from any sites under his control by regular watering of any stockpile, bare soil, haul road, un-surfaced traffic area and any sources of fatigue dust, when conditions require dust suppression. If, in the opinion of the Engineer, the dust suppression measures are ineffective, the developer shall take further measures to minimize the dust blow nuisance as directed by the Engineer.
- In case of any traffic disruption is caused by the construction activities of the developer (or his appointed contractors), the developer shall be responsible to provide separate pathway to the full operational use by the vehicles. The facilities in this regard shall be such that either party is not disturbed.
- In case of any road damage by the developer (or his appointed contractors), the developer shall notify the engineer about it and at his own cost shall repair the road to its original condition.
- In case of any damage incurred in agriculture or surrounding homesteads outside of the acquired land either permanently or temporarily by the developer or his appointed contractor activities, the developer shall be responsible to pay compensation for that upon the appropriate monetary evaluation applicable to the local market at the time the damage occurs.

Upon completion of construction, the developer shall remove equipment, surplus material, rubbish and temporary works of every kind the developer shall leave the site in clean condition to the satisfaction of the Engineer.

Appendix 1: National Standards – Wastewater/Liquid Waste Discharge Quality

a. Standards for Industrial Units and Projects: Quality at Discharge point
(Please mention in case of non compliance)

Parameters	Unit	Reading from sampling record	Inland surface water
Ammonia (free ammonia)	mg/l		5
Ammonical Nitrogen (as N)	mg/l		50
Arsenic	mg/l		0.2
BOD5 at 20°C	mg/l		50
Boron	mg/l		2
Cadmium (as CD)	mg/l		0.05
Chloride	mg/l		600
Chromium (as hexavalent Cr)	mg/l		0.1
Chromium (as total Cr)	mg/l		0.5
COD	mg/l		200
Copper (as Cu)	mg/l		0.5
Cyanide (as Cn)	mg/l		0.1
Dissolved Oxygen (DO)	mg/l		4.5 – 8
Dissolved Phosphorus (as P)	mg/l		8
Electrical conductivity (EC)	Mho/cm		1200
Fluoride (as F)	mg/l		7
Iron (as Fe)	mg/l		2
Lead (as Pb)	mg/l		0.1

Manganese (as Mn)	mg/l		5
Mercury (as Hg)	mg/l		0.01
Nickel (as Ni)	mg/l		1
Nitrate (as elementary N)	mg/l		10
Oil and Grease	mg/l		10
pH	mg/l		6 – 9
Phenolic Compounds (as C ₆ H ₅ OH)	mg/l		1
Radioactive substance	As determined by Bangladesh Atomic Energy Commission		
Selenium (as Se)	mg/l		0.05
Sulfide (as S)	mg/l		1
Temperature – Summer	°C		40
Temperature – Winter	°C		45
Total Dissolved Solids	mg/l		2100
Total Kjeldahl Nitrogen (as N)	mg/l		100
Total Suspended Solids (TSS)	mg/l		150
Zinc (as Zn)	mg/l		5

b. Wastewater/Liquid Waste Discharge Standards for Composite textile plant and large processing unit: Quality at Discharge Point (*Please mention in case of non compliance*)

Parameters	Unit	Reading from Record	Standard limit
pH			6.5 – 9
Total Suspended Solids	mg/l		100

BOD5 at 20°C	mg/l		150
Oil & Grease	mg/l		10
Total Dissolved Solids	mg/l		2100
Wastewater flow	lt/kg		100 lt/kg of fabric processing

c. Wastewater/Liquid waste discharge Standard for Tannery Industry: Quality at Discharge Point (*Please mention in case of non compliance*)

Parameters	Unit	Readings from Record	Standard limit
pH			6 – 9
Suspended solids	mg/l		150
BOD5 at 20°C	mg/l		100
Sulfide (as S)	mg/l		1
Total Chromium (as Cr)	mg/l		2
Oil and Grease	mg/l		10
Total Dissolved Solids	mg/l		2100
Wastewater flow	M ³ /ton		30 m ³ /ton of hide processing

Note: Soak liquor shall be separated from wastewater

Annex 17: BEPZA Tenant Lease Conditions related to Environmental Requirements

This document proposes draft conditions to be incorporated into BEPZA tenant lease requirements regarding the implementation of BEPZA's Environmental Monitoring and Enforcement Plan at the EPZs:

BEPZA has recently developed an Environmental Monitoring and Enforcement Plan (Plan) aimed at improving environmental conditions at their Export Processing Zones (EPZ) and in their surrounding communities, and the environmental performance of the enterprises/tenants operating within the EPZs. To ensure the success of this Plan, BEPZA has incorporated new conditions into the tenant lease agreement,

All tenants operating in the Export Processing Zones owned and managed by the Bangladesh Export Processing Zone Authority (BEPZA) must comply with the following environmental standards and practices:

- The environmental laws, regulations and standards of the Government of Bangladesh.
- Any additional environmental requirements stipulated by BEPZA. At present, these additional requirements are stipulated in the document, “Environmental Best Management Practices for Industrial Operations in the Export Processing Zones of Bangladesh” (Best Practice Manual). A copy of the Best Practice Manual is supplied to every tenant, for which the tenant is held responsible for proper implementation. Environmental training workshops will be held to assist the tenant in implementation of the Best Practice Manual; however, whether the tenant attends the training workshops or not, he/she is still held accountable for full implementation of the Best Practice Manual.
- BEPZA will perform periodic inspections of enterprises, with full right of entry and access to all pertinent information and documents pertaining to a tenant's compliance with the environmental laws, regulations and standards of the Government of Bangladesh, and the environmental requirements of BEPZA, including but not limited to the Best Practice Manual.
- If a BEPZA inspection notes any environmental violations and/or non conformances on behalf of the tenant, then the tenant is subject to enforcement actions, including fines and penalties, as stipulated in the BEPZA Environmental Enforcement Strategy (copy attached). Any right of appeal on behalf of the tenant shall be in conformance with BEPZA law and regulations.
- Tenants will receive an annual “risk rating” from BEPZA based on the environmental risks that their operations pose to BEPZA, and the management capacity that each tenant. This risk rating will incorporate environmental performance data that has been collected during the previous year as well as a

comprehensive audit that may include an additional inspection by an outside, contracted party to BEPZA, and will assess this information in developing a tenant “risk rating.” Risk ratings will either be classified as low, medium or high.

- Each tenant will be required to pay an “Annual User Fee” to BEPZA, based on their risk rating that covers the operational cost of performing baseline environmental inspections of tenant operations, as well as the annual audit costs and environmental training that may be conducted at the EPZs for the benefit of the tenants. Additional costs and inspections due to any noted environmental violations or non conformances of Bangladeshi environmental standards or BEPZA environmental requirements are in addition to the annual user fee. Annual user fees are gradated and based on the risk rating, with tenants classified as high risk having the highest annual user fee, medium risk having the second highest annual user fee, and those classified as low risk as having the lowest annual user fee to pay.
- Tenants are encouraged to develop the management tools, technology, and capacity to improve their environmental performance and lower their risk rating and annual user fees to BEPZA.
- To facilitate the requirement immediately above, BEPZA will:
 - encourage tenants to form and participate in a EPZ Environmental Committee that will allow tenants to share information and best practices with each other;
 - assist tenants as feasible in accessing low interest loans for investment in cleaner production and energy efficient equipment – this may be through existing programs including the International Finance Corporation (IFC) Sustainable Finance Program;
 - encourage tenants to develop cleaner production, utilization of less hazardous materials and chemicals in their processes, pollution prevention and energy efficiency and water conservation programs, by consideration of lower risk rating and lower annual fees for the proper implementation of such programs on the part of the tenant;
 - require all tenants to develop and implement an Environmental Management System (EMS) by the year 2015 into their operations. It is recommended that the tenant EMS be developed in accordance with ISO 14001 standards and receive accreditation for an ISO 14001 EMS. However, other EMS programs are also acceptable upon review and evaluation of BEPZA inspection for the purpose of satisfying this requirement.