Date: December 24, 2020

Environmental and Social Considerations in Detailed Planning Survey
(Technical Cooperation for Development Planning)

1. Full title of the Project:

The Integrated Energy and Power Master Plan Project

2. Type of the study (e.g. Master Plan, Feasibility Study, Detailed Design, etc.)

Master Plan

3. Categorization and its reason

With regard to the Section 10.1 of the BP, since the Project is categorized as B under the 'JICA Guidelines for Environmental and Social Considerations (April 2010)' (hereinafter referred to as "the JICA Guideline"). because the project aims at formulating an integrated master plan on energy and power, and is not likely to have significant adverse impact on the environment under the JICA guidelines for environmental and social considerations (April 2010) in terms of its characteristics and areas. The necessary procedures will be taken in accordance with the Guideline.

4. Agency or institution responsible for the implementation of the project

Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh

5. Outline of the Project (objectives, justification, location, proposed activities, and scope of the study)

(1) Overall goal

To improve energy intensity (Annual consumption of primary energy)/GDP PPP), by introduction of policy and technologies for low carbon/carbon neutral society, for achievement of sustainable development of Bangladesh.

(2) Outputs

- An integrated master plan by focusing on establishing a low/zero carbon energy system

in the long term perspective, which is necessary for achieving sustainable development of Bangladesh, will be formulated.

(An integrated master plan will consist of a several scenarios in consistent with IEA's analysis and data from relevant agency/utility on long-term energy balance scenario, with target years of master plan will be 2050, 2041, 2030, for achieving the objective of the Paris Agreement and the country's "Vision 2041.")

- Strengthened institutional capacity of energy data management, which is the bases of policy-making, planning, implementation and monitoring by the information collected through MRV (Measurement, Reporting and Verification), will be established.

(3) Activities

The Project will conduct the following contents of study jointly by Counterparts and the JICA expert team.

a) Review of current status of policies

- Review of current national development policy and energy sector policies
- Review of policies and Plans on Climate Change and Environmental issues
- Setting of long term scenarios of future energy mix and evaluation of policies and technologies to achieve such scenario

b) Energy Data Management

- Collection and analysis of latest energy data in both energy supply side and demand side in primary energy basis
- Recommendation and support for strengthening energy data management system (mainly HCU, Power Cell and SREDA)
- Recommendations and Assist on GHGs inventory report
- Recommendations to the revision of NDC

c) Balance of Primary Energy Supply and Final Consumption

- Study and collect basic information for primary energy demand forecast and making supply plan up to 2050 in electricity, residential, commercial, industrial, transport and agricultural sector
- Study the Eighth Five-year Development Plan, GSMP2017 and other relevant policies/plan
- Preparation of prospects for economic development and energy demand forecast by 2050

- Development of energy efficiency and conservation plan
- Analysis of long-term energy balance scenarios up to 2050, in consistent with IEA's scenario analysis, i.e. Stated Policy Scenario (STEPS), Sustainable Development Scenario (SDS) and Net Zero Emissions by 2050 case (NZE2050).
- Preparation of comprehensive plan for energy supply and demand system considering government target of climate change and economic development by 2050
- Calculation and analysis on financial cost and benefit for implementing above mentioned scenarios with consideration of price fluctuations and technical innovations on energy supply and demand, and its impact on national finance
- Calculation and analysis of cost and benefit required for developing infrastructure and institutions for energy supply and demand in short and mid term perspective
- Recommendations of policies, plans and technologies, by back-casting from the scenarios for achieving the above mentioned comprehensive energy supply and demand system, with the timeframe of midpoint in 2030, 2041 and 2050.

d) Development of Power System Plan

- Review of revisiting PSMP2016 and EECMP2016
- O&M policy
- Review and evaluation of the best mix of generation power sources
- Study of issues related to generation and transmission development plan
- Study of consistency between distributed energy system including REs, batteries and energy management systems development, and power development plan
- Study of economic impact on energy price hike and its countermeasures

e) LNG Legal Framework

- Analysis of current laws and regulations in Bangladesh and identification of issues;
- Recommendations for drafting laws and regulations following the discussion with stakeholders in Bangladesh on the results of analysis.

f) Environment and Social Considerations

- Study of issues related to environmental and social considerations including strategic environmental assessment (SEA)

g) Description of the project site (maps, environmental and social condition, current issues, etc.)

(1) Map

Source: United Nations Cartographic Section

(2) Land Use and Forest Cover

The following table (Table 1) shows areas by land use category and distribution of forest coverage in Bangladesh. Agricultural land makes up 65 percent of the total geographic surface area. Forest areas account for almost 17 percent. Hill forest areas that are 670,000 hectares or 4.54 percent of the total area are mainly situated in the Chittagong, Cox's Bazar, Rangamati, Khagrachari, Bandarban, and Sylhet Districts. The sandarac mangrove forest area, which is 601,700 hectares or 4.07 percent of the total area, is the world's largest contiguous natural mangrove forest. 'Sal (*Shorea robusta*)' forest areas, which are 120,000 hectares or 0.81 percent of the total area, are mainly situated in plain land of Gazipur, Tangail, Mymensingh, Sherpur, Jamalpur, Netrokona, Naoga, Rangpur, Dinajpur, and Panchagar Districts.

Table 1: Land Use Category of Bangladesh

Land Use Category	Area (Million Hectares)	Percent
Agriculture	9.57	64.9
State Forest		
Classified (Managed by Forest Department)	1.52	10.3
Unclassified (Managed by Ministry of Land)	0.73	5
Private Forest		
Homestead	0.27	1.8
Tea/Rubber Garden	0.07	0.5
Urban	1.16	7.9
Water	0.94	6.4
Other	0.49	3.2
Total	14.75	100

(3) Protected Areas

Protected areas in Bangladesh follow the following Wildlife (Conservation and Security) Act 2012 (26 Ashar,1419) that has been passed by the Bangladesh National Parliament on 10 July 2012. The definitions related to Wildlife (Conservation and Security) Act 2012 are shown in Table below (table 2).

Table 2: Definitions related to Wildlife (Conservation and Security) Act 2012

Term	Definition
Protected Area	All sanctuaries, national parks, community conservation areas, safari parks, eco-parks, botanical gardens, special biodiversity conservation area and traditional heritage
Sanctuary	An area where hunting, killing, shooting or trapping of wild animal is prohibited and managed for the protection of all natural resources such as vegetation, soil and water primarily for undisturbed breeding of wildlife

National Park	Comparatively large area of outstanding scenic and natural beauty with the primary object of providing public education, research and recreation and managed for preservation of natural state of flora and fauna and outstanding charming scenery
Eco-Park	An area of natural ecological habitat of flora and fauna with outstanding scenic beauties which is managed for providing recreational facilities for visitors
Biodiversity conservation area	Genetic diversity and species diversity of all species or sub-species of flora and fauna living in aquatic, terrestrial and marine ecosystems or diversity of their ecosystems
Safari Park	An area where indigenous and exotic wild animal species are protected in an approximation of a natural environment for increasing the population and grazing openly
Botanical Garden	An area where different native and exotic plan species are conserved or managed for education, research and conservation and improvement of source of genepool introducing from another habitat
Community Conservation Area	Any area which is a private or community or government land under management for the protection of flora and fauna and as a conservation site of traditional or cultural heritage

Source: Bangladesh Forest Department, Ministry of Environment and Forests

The Notified Protected Areas such as National Parks and Wildlife Sanctuaries and other conservation sites are shown in Tables 3 and 4 respectively. The Protected Area Covers 10.72% of total forest area.

Table 3: National Parks and Wildlife Sanctuaries

National Parks				
Sl. No.	Name	Location	Area (ha.)	Established
1	Bhawal National Park	Gazipur	5,022.00	11-5-1982
2	Madhupur National Park	Tangail & Mymensingh	8,436.00	24-2-1982
3	Ramsagar National Park	Dinajpur	27.75	30-4-2001
4	Himchari National Park	Cox's Bazar	1,729.00	15-2-1980
5	Lawachara National Park	Moulavibazar	1,250.00	7-7-1996
6	Kaptai National Park	Chittagong Hill Tracts	5,464.00	9-9-1999
7	Nijhum Dweep National Park	Noakhali	16,352.23	8-4-2001
8	Medhakachhapia National Park	Cox's Bazar	395.92	8-8-2008

9	Satchari National Park	Habigonj	242.91	15-10-2005
10	Khadimnagar National Park	Sylhet	678.8	13-04-2006
11	Baroiyadhala National Park	Chittagong	2,933.61	06-04-2010
12	Kuakata National Park	Patuakhali	1,613.00	24-10-2010
13	Nababgonj National Park	Dinajpur	517.61	24-10-2010
14	Singra National Park	Dinajpur	305.69	24-10-2010
15	Kadigarh National Park	Mymensingh	344.13	24-10-2010
16	Altadighi National Park	Naogaon	264.12	24-12-2011
17	Birgonj National Park	Dinajpur	168.56	24-12-2011
Wildlife Sanctuaries				
Sl. No.	Name	Location	Area (ha.)	Established
18	Rema-Kalenga Wildlife Sanctuary	Hobigonj	1,795.54	7-7-1996
19	Char Kukri-Mukri Wildlife Sanctuary	Bhola	40	19-12-1981
20	Sundarban (East) Wildlife Sanctuary	Bagerhat	31,226.94	6-4-1996
21	Sundarban (West) Wildlife Sanctuary	Satkhira	71,502.10	6-4-1996
22	Sundarban (South) Wildlife Sanctuary	Khulna	36,970.45	6-4-1996
23	Pablakhali Wildlife Sanctuary	Chittagong Hill Tracts	42,087.00	20-9-1983
24	Chunati Wildlife Sanctuary	Chittagong	7,763.97	18-3-1986
25	Fashiakhali Wildlife Sanctuary	Cox's Bazar	1,302.43	11-4-2007
26	Dudpukuria-Dhopachari Wildlife Sanctuary	Chittagong	4,716.57	6-4-2010
27	Hajarikhil Wildlife Sanctuary	Chittagong	1,177.53	6-4-2010
28	Sangu Wildlife Sanctuary	Bandarban	2,331.98	6-4-2010
29	Teknaf Wildlife Sanctuary	Cox's Bazar	11,615.00	24-03-2010
30	Tengragiri Wildlife Sanctuary	Barguna	4,048.58	24-10-2010
31	Dudhmukhi Wildlife Sanctuary	Bagerhat	170	29-01-2012
32	Chadpai Wildlife Sanctuary	Bagerhat	560	29-01-2012
33	Dhangmari Wildlife Sanctuary	Bagerhat	340	29-01-2012
34	Sonarchar Wildlife Sanctuary	Patuakhali	2,026.48	24-12-2011
35	Nazirganj Wildlife (Dolphin) Sanctuary	Pabna	146	01-12-2013
36	Shilanda-Nagdemra Wildlife (Dolphin) Sanctuary	Pabna	24.17	01-12-2013
37	Nagarbari-Mohanganj Dolphin Sanctuary	Pabna	408.11	01-12-2013
38	Swatch of No-Ground Marine Protected Area	South Bay of Bengal	173,800.00	27-10-2014

Source: Bangladesh Forest Department, Ministry of Environment and Forests

Table 4: Other Conservation Sites

No.	Name	Location	Area (ha.)	Established
1	National Botanical Garden	Dhaka	84.21	1961
2	Baldha Garden	Dhaka	1.37	1909
3	Madhabkunda Eco-Park	Moulavibazar	265.68	2001
4	Sitakunda Botanical Garden and Eco-park	Chittagong	808	1998
5	Bangabandhu Sheikh Mujib Safari Park	Cox's Bazar	600	1999
6	Modhutila Eco-Park	Sherpur	100	1999
7	Banshkhali Eco-Park	Chittagong	1200	2003
8	Kuakata Eco-Park	Patuakhali	5661	2005
9	Tilagar Eco-Park	Sylhet	45.34	2006
10	Borshijora Eco-Park	Moulavibazar	326.07	2006
11	Bangabandhu Sheikh Mujib Safari Park	Gazipur	1493.93	2013
12	Rajeshpur Eco-Park	Comilla	185.09	n.a.

Source: Bangladesh Forest Department, Ministry of Environment and Forests

(4) Ecosystem

In addition to protected areas, the 1995 Bangladesh Environment Conservation Act includes provision for Ecologically Critical Area (ECA) declarations by the Department of the Environment in certain cases where the ecosystem is considered to be in danger of reaching a critical state.

Table 5: Ecologically Critical Areas (ECA)

No.	Name	District(s)	Area (ha)
1	The Sundarbans	Bagerhat, Khulna, Satkhira	762,034
2	Cox’s Bazar (Teknaf, Sea beach)	Cox’s Bazar	10,465
3	St. Martin Island	Cox’s Bazar	590
4	Sonadia Island	Cox’s Bazar	4,916
5	Hakaluki Haor	Maulavi Bazar	18,383
6	Tanguar Haor	Sunamganj	9,727
7	Marjat Baor	Jhinaidha	200
8	Gulshan-Banani-Baridhara Lake	Dhaka	n.a.

Source: Profile on Environmental and Social Considerations in Bangladesh, JICA, July 2012

(5) Ethnic Minorities

Table below shows distribution of ethnic population and households by Zila (District).

Table 6: Distribution of Ethnic Population and Households by Zila, 2011

Name of Zila	Tribal					
	Household	Institutional	Others	Population	Male	Female
Bangladesh	**353727**	**370**	**2078**	**1586141**	**797477**	**788664**
1. Bagerhat	698	0	5	3327	1677	1650

Name of Zila	Tribal					
	Household	Institutional	Others	Population	Male	Female
2. Bandarban	36288	75	313	172401	87670	84731
3. Barguna	325	0	3	1143	565	578
4. Barisal	15	0	2	76	45	31
5. Bhola	11	0	0	57	28	29
6. Bogra	2008	0	7	7981	3984	3997
7. Brahmanbaria	25	0	2	118	59	59
8. Chandpur	282	0	2	1292	674	618
9. Chittagong	6834	23	0	32165	16329	15836
10. Chuadanga	329	0	149	1268	611	657
11. Comilla	604	4	10	2974	1667	1307
12. Cox's Bazar	2885	1	34	14551	7045	7506
13. Dhaka	4615	31	323	20123	10400	9723
14. Dinajpu	15999	7	43	66861	33030	33831
15. Faridpur	651	0	5	3233	1670	1563
16. Feni	117	3	15	639	351	288
17. Gaibandha	1123	0	1	4312	2111	2201
18. Gazipur	3525	7	48	15368	7702	7666
19. Gopalganj	348	1	3	206	1080	986
20. Habiganj	14534	0	38	65802	33038	32764
21. Joypurhat	5705	1	11	23139	11712	11427
22. Jamalpur	376	0	9	1569	803	766
23. Jassore	3790	0	5	17432	8779	8653
24. Jhalokati	11	0	0	57	28	29
25. Jhenaidah	698	0	6	3108	1528	1580
26. Khagrachhari	70175	23	26	316987	159310	157677
27. Khulna	476	1	2	2054	1022	1032
28. Kishoreganj	94	0	2	433	227	206
29. Kurigram	115	0	3	486	226	260
30. Kushtia	373	0	2	1666	819	847
31. Lakshmipur	56	0	3	244	131	113
32. Lalmonirhat	23	0	0	126	59	67
33. Madaripur	17	0	1	76	38	38
34. Magura	1760	1	3	8099	4043	4056
35. Manikganj	115	1	0	582	313	269
36. Meherpur	4	0	1	18	9	9
37. Maulvibazar	13217	3	42	63466	31422	32044
38. Munshigani	24	0	7	103	78	25
39. Mymenihgh	8632	18	39	35907	17288	18619
40. Naogaon	28374	3	20	116736	57863	58873
41. Narail	208	0	0	943	465	478
42. Narayanganj	165	2	26	899	603	296
43. Narsingdi	40	0	4	208	109	99
44. Natore	2853	1	6	11912	5927	5985
45. Nawabganj	3216	1	4	14190	7031	7159

Name of Zila	Tribal					
	Household	Institutional	Others	Population	Male	Female
46. Netrokona	6021	10	38	25247	12323	12924
47. Nilphamari	109	0	0	495	257	238
48. Noakhali	51	0	7	347	201	146
49. Pabna	501	0	2	1973	973	1000
50. Panchagar	383	0	3	1528	751	777
51. Patuakhali	376	0	3	1399	707	692
52. Pirojpur	12	0	1	53	26	27
53. Rajshahi	11132	6	78	49312	24136	25176
54. Rajbari	293	0	0	1285	612	673
55. Rangamati	76821	121	411	356153	181820	174333
56. Rangpur	4727	4	10	18561	9180	9381
57. Shariatpur	10	0	1	93	80	13
58. Satkhira	569	0	2	2615	1278	1337
59. Sirajganj	4676	5	7	19772	9583	10189
60. Sherpur	4180	4	12	16231	8091	8140
61. Sunamgani	1444	4	6	6911	3521	3390
62. Sylhet	2484	1	10	12781	6470	6311
63. Tangail	6071	8	18	25584	13022	12562
64. Thakurgaon	2139	0	4	9632	4891	4741

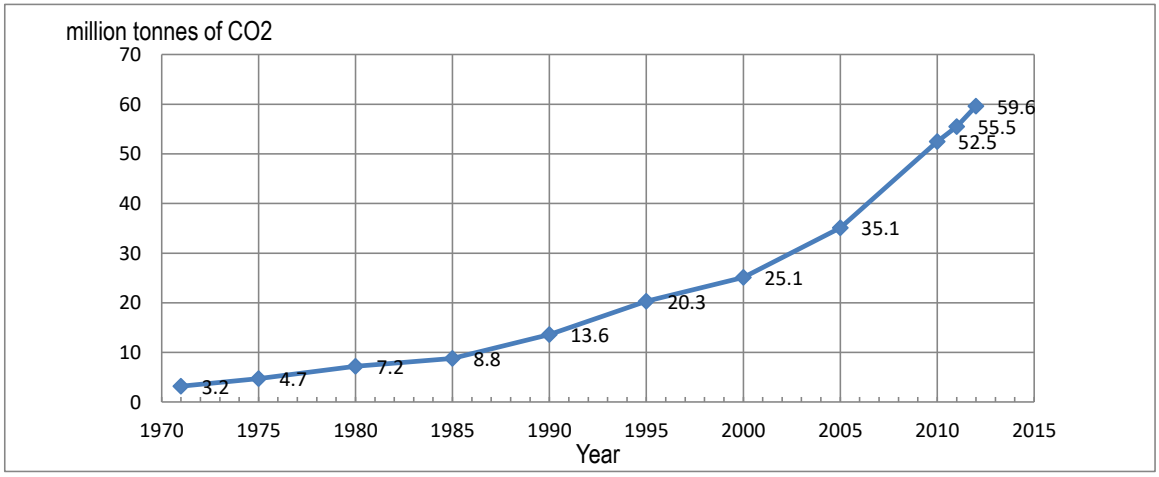
Source: Population and Housing Census- 2011, Bangladesh Bureau of Statistics

(6) CO2 Emission

CO2 emission from fuel combustion in Bangladesh in 2012 was 59.6 million tons that is 4.38 times as much as one in 1990, and had doubled for the past decade. CO2 emission from electricity and heat production sector was 47 % of the total emission in 2012.

Figure: CO2 Emission from Fuel Combustion in Bangladesh

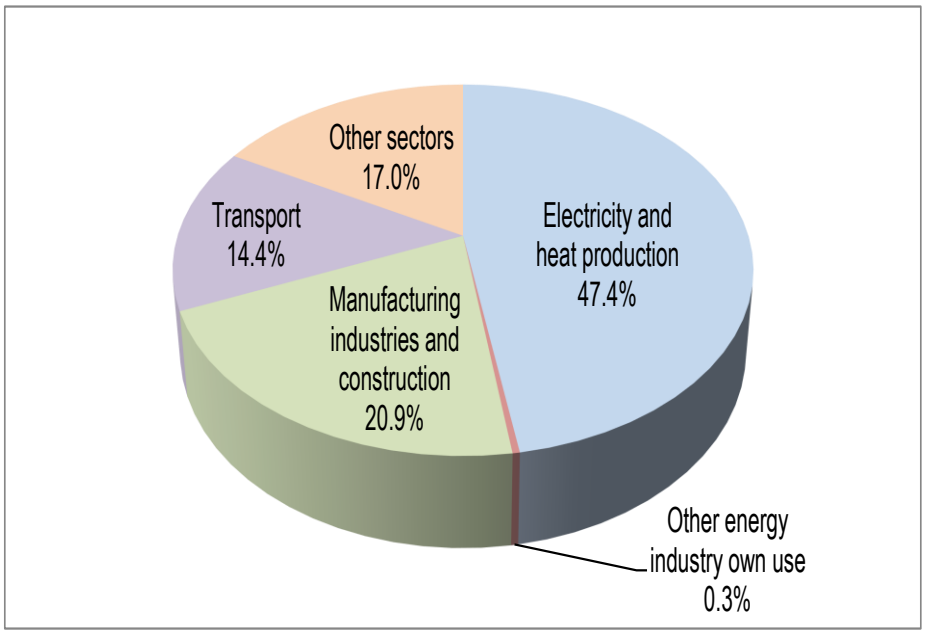
(Changes in CO2 emission)



Source: International Energy Agency, CO2 EMISSIONS FROM FUEL COMBUSTION 2014 EDITION

Figure: CO2 Emission from Fuel Combustion in Bangladesh

(CO2 emissions by sector in 2012)



Source: International Energy Agency, CO2 EMISSIONS FROM FUEL COMBUSTION 2014 EDITION

6. Legal Framework of Environmental and Social Considerations

(1) Laws, regulations and standards related to environmental and social issues including requirements and procedures of Environmental Impact Assessment (EIA), stakeholder participation, and information disclosure.

1) National Conservation Strategy (NCS) 1992

In 1987, the National Conservation Strategy (NCS) was formulated by the Bangladesh Agricultural Research Council in cooperation with the IUCN. The NCS was drafted in late 1991 and submitted to the government in early 1992. It aims to:

- assess the usage patterns of natural resources and the future needs and possibilities of major development activities to set a feasible and sustainable strategy to conserve limited natural resources; and
- reconcile development and the environment to ensure the sustainable use of resources, species and ecosystems in the future. In particular, it underlines the importance of ecosystems in coastal areas, hilly forests and the Sundarban wetland.

2) National Environmental Management Action Plan (NEMAP) 1995

The 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 for a period from 1995 to 2005 and sets out the framework within which the recommendations of the NCS are to be implemented.

NEMAP has the broad objectives of:

- Identification of key environmental issues affecting Bangladesh;
- Identification of actions necessary to halt or reduce the rate of environmental degradation;
- Improvement of the natural and built environment;
- Conservation of habitats and biodiversity;
- Promotion of sustainable development; and
- Improvement in the quality of life of the people.

To attain the above-mentioned objectives, the plan groups all the relevant necessary actions under four headings, namely: institutional, sectoral, location-specific and long-term issues.

The institutional aspects reflect the need of inter sectoral cooperation to tackle environmental problems which need new and appropriate institutional mechanisms at national and local levels. The sectoral action reflects the way the ministries and agencies are organized and makes it easier to identify the agency to carry out the recommended actions. The location-specific action focuses particularly on acute environmental problems at local levels that need to be addressed on a priority basis. The long-term actions include environmental degradation to such degree that might become even more serious and threatening, if cognizance is not taken immediately.

One of the key issues in NEMAP regarding the energy sector has been that “energy conservation awareness is generally low throughout the country”. NEMAP did not recognize mineral resources as an important sector and there is no separate discussion on this.

3) Seventh Five-Year Plan (2016-2020)

The present Seventh Plan’s articulation of a sustainable development strategy involves a large array of actions under three key themes: (i) Climate Change Management and Resilience (comprised of adaptation and mitigation) (ii) Environmental Management; and (iii) Disaster Management. These actions are aligned with the overall framework and strategies of National Sustainable Development Strategy (NSDS) and are broadly consistent with the scope of the post-2015 Sustainable Development Goals (SDGs). Some of the objectives and activities that were considered under the Sixth Plan but were not addressed or

implemented have also found consideration under Seventh Plan, provided they have an instrumental role in aiding the key objectives of the Plan. This chapter is focused on Climate Change Management and Resilience and Environmental Management mostly. The detail of Disaster Management is discussed in Chapter 14 of Part 2 as the Ministry of Disaster Management and Relief is within the purview of Social Welfare and Security sector.

SEA issues are articulated in the 7th Five Year Plan at Sector 8: Environment and Climate Change, Chapter 8-Sustainable Development: Environment and Climate Change (Page(s)-485-486), and 8.6 Internal Environment Management. SEA Activities are proposed under 7th Five Year Plan for Environment Management such as in Issue 3: Strengthening EIA system as environment management Tool. Under ECA'95, EIA has been accepted as a mandatory tool to identify and predict impacts and undertake proper mitigation measures in a project scale. There is another concern that, most of the developing Ministries and agencies escape the process. There is also a need for introducing strategic EIA as a planning tool for sectoral level planning.

- Strengthening the EIA processing & implementation through institutional capacity building.
- Issuance of location clearance after approval of EIA report for Red category projects.
- No land development activity to take place prior to environment clearance.
- Gazetting and publicizing EIA guidance manual & sectoral EIA guideline prepared.
- Enlistment of competent EIA consulting firms by the DoE for conducting EIA.
- Immediate framing of detailed rules on EIA as mandated in section 12 of BECA
- Strategic EIA/SEA for all sectoral planning including for exclusive economic zones.
- Achieving compliance to EIA practices by all development Ministries & agencies.
- Public consultation on EIA report of Red category projects

4) National Forest Policy (NFP) (1994)

The NFP of 1994 is the amended and revised version of the NFP of 1977 in the light of the National Forestry Master Plan (NFMP). The major target of the policy is to conserve the existing forest areas and bring about 20% of the country's land area under the forestation program and increase the reserve forest land by 10% by the year 2015 through coordinated efforts of governmental-NGOs and active participation of the people.

Amendments of the existing laws (acts, rules and regulations) relating to the forestry sector

and creation of new laws for sectoral activities have been recognized as important conditions for achieving the policy goals and objectives. The forestry policy also recognizes the importance of fulfilling the responsibilities and commitments under International Conventions, Treaties and Protocols (ICTPs).

5) The Bangladesh Forestry Act 1927

The Bangladesh Forestry Act (BFA) of 1927 provides for reserving forests over which the government has an acquired property right. This act has made many types of unauthorized uses or destruction of forest produce punishable. The government may assign any village community its right to or over any land, which constitutes a reserved forest.

Other Forest Acts

The supplementary rules of 1959 empower the concerned governmental bodies to restrict totally and for a specified period, the shooting, hunting or catching of various birds, animals and reptiles in the controlled and vested forests. The private forest ordinance of 1959 provides for the conservation of private forests and for the forestation, in certain cases, of wastelands in Bangladesh.

10) Bangladesh National Environmental Policy (1992)

Bangladesh National Environmental Policy (BNEP) of 1992 sets out the basic framework for environmental action, together with a set of broad sectoral action guidelines. The BNEP provides the broader framework of sustainable development in the country. It also states that all major undertakings, which will have a bearing on the environment, (including setting up of an industrial establishment) must undertake an IEE / EIA before they initiate the Project.

The BNEP delineates the DoE, as the approving agency for all such IEE / EIA's to be undertaken in the country.

Policies of fifteen sectors are described in the BNEP. Under the energy and fuel sector, the use of fuel that has the least environmental impact is encouraged in Section 3.4.1. conservation of fossil fuel is stressed in Section 3.4.5 and the need for conducting EIA's before implementation of projects for fuel and mineral resources is stressed in Section 3.4.6.

Under the Environmental Action Plan (EAP) Section of the BNEP and sub-section 'Fuel and Energy', it is suggested that:

- The use of gas, coal, kerosene and petrol as fuel will be expanded in the rural areas, so that fuel wood, agricultural residues, and cow dung is conserved. This

will help the use of agricultural residues, and cow dung etc. as manure; and

- Appropriate measures will be taken to ensure that extraction; distribution and use of natural resources such as oil, gas, coal, peat etc. do not adversely affect air, water, land, the hydrological balance and the ecosystem.

Section 3.7 "Forest, Wildlife and Biodiversity" requires:

- Conserve wildlife and biodiversity strengthen related research and help dissemination and exchange of knowledge in these areas; and
- Conserve and develop wetlands and protection of migratory birds.

11) Bangladesh National Environmental Policy (2017)

National Environmental Policy-2017 has been placed to the Honorable Prime Minister for Approval. This policy has stated the following points regarding the SEA.

- All the fields required confirmation of the execution of Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA)
- Environmental Policy
  - Land Resources Management
    - ✓ Ecosystem and Regional-Ecosystem based land zoning have to be planned and Regional-Ecosystem based SEA execution should be ensured.
  - Organizational Set-up
    - ✓ Relevant all ministries and offices shall formulate SEA on their sectoral policy, plan and program.
  - National Environment Policy Compliance
    - ✓ Accommodation, Housing and Urbanization
      - ✓ EIA and SEA should be carried out before formulation of all National Regional Projects and Master Plan proposed for housing and urbanization
      - ✓ For the separation of residential, commercial and industrial areas, the zoning should be made through SEA. Preparation and implementation of environmentally-friendly and regional urban planning.
      - ✓ In order to set up industrial establishments in a planned manner, SEA guided land zoning would be required for building the subject based

industrial Area. Restricted establishment of industrial factories in residential areas and Transfer existing industrial factories of the residential areas to the scheduled areas.

12) Bangladesh Wildlife Preservation Act (1973; Amended in 1974)

The Bangladesh Wildlife Preservation Act (BWPA) of 1973 provides for the preservation, conservation and management of wildlife in Bangladesh. The earlier laws on wildlife preservation, namely, the elephant preservation act of 1879, the wild bird and animal's protection act of 1912, and the rhinoceros preservation act of 1932 have been repealed and their provisions have been suitably incorporated in the BWPA.

The BWPA encompasses a range of different activities including hunting and fishing although the provisions of greatest significance relate to the establishment of national parks, wildlife sanctuaries and game reserves by the MoEF. Such designations have enormous significance for the types of developments that may take place.

This legislation does not provide scope for creation of a strong organization, which can adopt appropriate measures to protect wildlife. The importance of wildlife could have been highlighted in the legislation, which it does not do. Punitive provisions are not readily usable. The types of endangered and ecologically valuable animals/birds could have been highlighted in the legislation. It should have asked for active participation and specific action from local administration to protect wildlife. It also does not prescribe seasons when certain animal/birds cannot be hunted or captured.

An executive order issued in June 1998, in relation to the Bangladesh Wildlife Preservation Order (BWPO) of 1973 has imposed a ban for the next five years on hunting of any form of wildlife.

13) Environmental Conservation Act (1995, Amended in 2000, 2002 and as amended till October 5, 2010)

The Bangladesh Environment Conservation Act (ECA) of 1995 is currently the main legislation in relation to environment protection in Bangladesh. The ECA is promulgated for environment conservation, environmental standards development and environment pollution control and abatement. It has repealed the environment pollution control ordinance of 1977.

The main objectives of ECA are:

- Conservation and improvement of the environment; and
- Control and mitigation of pollution of the environment.

The main strategies of the ECA can be summarized as:

- Declaration of ecologically critical areas and restriction on the operations and processes, which can or cannot be carried/initiated in the ecologically critical areas;
- Regulations in respect of vehicles emitting smoke harmful for the environment;
- Environmental clearance;
- Regulation of the industries and other development activities' discharge permits;
- Promulgation of standards for quality of air, water, noise and soil for different areas for different purposes;
- Promulgation of a standard limit for discharging and emitting waste; and
- Formulation and declaration of environmental guidelines.

Before any new project can go ahead, as stipulated under the rules, the project promoter must obtain environmental clearance from the DG. An appeal procedure does exist for those promoters who fail to obtain clearance. Failure to comply with any part of this Act may result in punishment to a maximum of 3 years imprisonment or a maximum fine of Tk. 300,000 or both. The DoE executes the ECA under the leadership of the DG.

The amendments (2000, 2002 and as amended till October 5, 2010) of the ECA focus on:

- Ascertaining responsibility for compensation in cases of damage to ecosystems;
- Increased provision of punitive measures both for fines and imprisonment; Fixing authority on cognizance of offences;
- Restriction on polluting automobiles;
- Restriction on the sale and production of environmentally harmful items like polythene bags;
- Assistance from law enforcement agencies for environmental actions; and
- Break up of punitive measures and (5) authority to try environmental cases.

14) Environmental Conservation Rules (1997)

These are the first set of rules, promulgated under the ECA of 1995 (so far there have been three amendments to this set of rules - February and August 2002 and April 2003). The Environment Conservation Rules (ECR) of 1997 has provided categorization of industries and projects and identified types of environmental assessments needed against respective categories of industries or projects.

Among other things, these rules set (i) the National Environmental Quality Standards for

ambient air, various types of water, industrial effluent, emission, noise, vehicular exhaust etc., (ii) the requirement for and procedures to obtain environmental clearance, and (iii) the requirement for IEE/ EIA's according to categories of industrial and other development interventions.

The Rules are not explicit for various oil and gas exploration interventions. Rather, this is covered under the broader heading of "exploration, extraction and distribution of mineral resources" under the Red Category projects.

(2) Relative agencies and institutions

1) Ministry of Environment and Forest

The Ministry of Environment and Forest (MoEF) is the key government institution in Bangladesh for matters relating to national environmental policy and regulatory issues. Realizing the ever-increasing importance of environmental issues, the MoEF was created in 1989 and is presently a permanent member of the executive committee of the National Economic Council (NEC). This group is the major decision-making body for economic policy and is also responsible for approving public investment projects. The MoEF oversees the activities of the following agencies:

Department of Environment (DoE);

Department of Forest (DoFo);

Forest Industries Development Corporation (FIDC);

Bangladesh Forest Research Institute (BFRI) and Institute of Forestry (IoF);

Forestry division of the Bangladesh Agricultural Research Council (BARC); and

National Herbarium.

Of the above agencies a precise description of the first two departments including other pertinent ones are presented below as considered relevant.

2) Department of Environment

The Department of Environment (DoE), established in 1989 under the jurisdiction of the MoEF, is the executing agency for planning and implementing environmental issues including, but not limited to, the following activities:

- Reviewing environmental impact assessments and issuing environmental clearance where appropriate;
- Implementing environmental monitoring programs and enforcement measures;

- Developing and maintaining environmental data bases; and
- Coordinating international events with the MoEF (e.g., representing Bangladesh in international seminars, workshops, etc.).

The DoE is headed by a Director General (DG) who is supported by a team of directors, deputy directors, assistant directors, engineers, and other technical staff (e.g., chemists and laboratory technicians). The DoE has regional offices, monitoring stations and several laboratories. Figure below shows the organizational set-up of DoE.

3) Department of Forest

The Department of Forest (DoFo), under the MoEF, is responsible for protection and management of the reserve forests in the country. The department manpower extends down to union levels in areas where reserve forest exists. Officers of the DoFo are responsible for protection of wildlife in these forest areas.

4) Ministry of Land - Land Reform and Land Acquisition Directorate

The Ministry of Land (MoL) manages revenue generation for government-owned land (called khas), excluding agency-owned lands controlled by the BWDB, roads and highways, etc. The MoL controls open water bodies (rivers, beels, haors) above a specified size, except for those that were transferred to the Ministry of Fisheries (MoF) and livestock under the new fisheries management policy.

The MoL approves the process where the government acquires private land with regard to private development program.

8. Provisional Scoping (types and magnitudes of possible adverse impacts)

A provisional scoping is conducted for the Project. The results are shown in Table 7: Power Plant Development and Table 8: Transmission Lines Development. Table 7 was prepared to assess the general impacts of a power plant project, regardless of its power source such as thermal, hydro, or other renewable sources.

Table 7: Provisional Scoping of the Project (Power Plant Development)

No.	Impact Item	Rating		Description of Impacts/Reasons for Rating
		Pre-Construction/ Construction.Stage	Operation Stage	
Pollution				
1	Air pollution	B-	Thermal: A- Others: D	[Construction Stage] ➢ Air pollution caused by heavy machines and vehicles is expected. ➢ Air pollution by dust around roads and other places is expected. [Operation Stage] ➢ Thermal power: SOx, NOx, PM, and dust may be generated by the operation of the power plant. ➢ Other power: Significant air pollution is not expected.
2	Water pollution	B-	B-	[Construction Stage] ➢ Water pollution by oil and others from heavy machines and vehicles is expected. ➢ Water pollution by surplus soil from underground facility construction sites containing minerals is expected. [Operation Stage] ➢ The impact of plant wastewater, oil-containing wastewater, domestic wastewater, thermal wastewater, etc., are expected by the plant operation.

3	Waste	B-	B-	[Construction Stage] ➢ Wastes from construction sites are expected. ➢ It may be necessary to find soil dumping sites. [Operation Stage] ➢ Wastes from power station and other facilities are expected.
4	Soil pollution	B-	D	[Construction Stage] ➢ Soil contamination by oil and others from heavy machines and vehicles is expected. ➢ Soil contamination by surplus soil from underground facility construction sites containing minerals from is expected. [Operation Stage] ➢ No activities which give negative impacts are planned.
5	Noise and vibration	B-	B-	[Construction Stage] ➢ Noise and vibration from heavy machines and vehicles are expected. ➢ Noise and vibration during road works are expected. ➢ Noise from blasting are expected. [Operation Stage] ➢ Noise from substations is expected.
6	Ground subsidence	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
7	Offensive odors	B-	D	[Construction Stage] ➢ Odor from wastes and sewage from construction sites are expected. [Operation Stage] ➢ No activities which give negative impacts are planned.
8	Bottom sediment	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
Natural Environment				
9	Protected areas	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.

10	Ecosystem	Hydro: A- Others: C	Hydro: A- Others: C	Hydro power: Significant impact to local ecosystem is expected Other power: Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
11	Hydrology	Hydro: A- Others: C	Hydro: A- Others: C	Hydro power: Significant impact to local hydrology is expected. Other power: Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
12	Geographical features	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
Social Environment				
13	Resettlement/ Land Acquisition	C	D	[Planning stage] ➢ Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined. [Operation Stage] ➢ No activities which give negative impacts are planned.
14	Poor people	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
15	Ethnic minorities and indigenous peoples	C	C	There are many dialects (or languages) and cultures in Bangladesh. Although details of impacts (including their existences) are not known, the Project understands these cultures well and develops the plan of the country to achieve a balanced society.
16	Local economies, such as employment, livelihood, etc.	B+	B-	[Construction stage] ➢ Employment by the Project is expected. [Operation Stage] ➢ Unemployment may become an issue after the completion of construction.

17	Land use and utilization of local resources	B-	C	[Planning stage] ➢ Land use and utilization of local resources may change. [Operation Stage] ➢ Negative impacts and positive impacts are expected because of change of land use and utilization of local resources. However impacts will be evaluated again when the content of the Project is determined.
18	Water usage	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
19	Existing social infrastructures and services	B-	C	[Construction stage] ➢ Impacts by new construction works such as construction site and new access roads are expected. [Operation Stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
20	Social institutions such as social infrastructure and local decision-making institutions	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
21	Misdistribution of benefits and damages	B-	C	[Planning stage] ➢ There may be feelings of resentment, because people living around the project site will benefit through the improvement of social infrastructure and services. People to be resettled and those who lose their means of livelihoods will receive certain compensation. ➢ There is a possibility that not only economic damages and benefits but also impacts on traditional lives of local people may occur. [Operation Stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.

22	Local conflicts of interest	B-	C	[Planning stage] ➢ People to be resettled and those who will lose their means of livelihoods will receive certain compensation. ➢ Local conflicts of interest may occur between residents, and between local administration bodies and local political leaders. [Construction stage] ➢ Conflicts between local residence and external workers may occur because of changes in local customs if the external workers cannot understand local customs. [Operation Stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
23	Cultural heritage	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
24	Landscape	B-	B-	[Planning stage] ➢ Impacts on movable cultural properties, intangible cultural heritages and cultural sites are expected. [Construction stage] ➢ Impacts by construction works are expected. [Operation Stage] ➢ Impacts by soil erosions and slope failures along access roads are expected depending on topography and geology.
25	Gender	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
26	Children's rights	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.

27	Infectious diseases such as HIV/AIDS	B-	C	[Construction stage] ➢ Infectious diseases may be spread because of the inflow of external workers. [Operation Stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
28	Working conditions (including occupational safety)	B-	B-	[Construction stage] ➢ Accidents of workers are expected. ➢ Diseases caused by dust are expected. [Operation Stage] ➢ Accidents such as a traffic accident during maintenance activities are expected.
29	Accidents	B-	B-	[Construction stage] ➢ Accidents and traffic congestions by construction works are expected. ➢ Accidents to neighboring residents including electrocution are expected. ➢ Accidents such as slope failures are expected. [Operation Stage] ➢ Short-circuit accidents at substations and fires accompanying short-circuit accidents are expected. ➢ Slope failures along access roads are expected depending on topography and geology. ➢ Accidents such as a traffic accident during maintenance activities are expected.
Other				
30	Trans-boundary impacts or climate change	B-	A+	[Construction stage] ➢ Emissions from forest clearance are expected. ➢ Emissions from heavy machines and vehicles are expected. [Operation Stage] ➢ In case of introduction of renewable power source, the plant may contribute to the reduction of carbon emissions at regional level by exporting electricity to neighboring.

Table 8: Provisional Scoping of the Project (transmission lines development)

No.	Impact Item	Rating		Description of Impacts/Reasons for Rating
		Pre-Const. Phase	Operation Phase	
Pollution				
1	Air pollution	B-	D	[Construction Stage] ➢ Air pollution caused by heavy machines and vehicles is expected. [Operation Stage] ➢ No activities which give negative impacts are planned.
2	Water pollution	B-	D	[Construction Stage] ➢ Water pollution by oil and others from heavy machines and vehicles is expected. [Operation Stage] ➢ No activities which give negative impacts are planned.
3	Waste	B-	D	[Construction Stage] ➢ Wastes from construction sites are expected. [Operation Stage] ➢ No activities which give negative impacts are planned.
4	Soil pollution	B-	D	[Construction Stage] ➢ Soil contamination by oil and others from heavy machines and vehicles is expected. [Operation Stage] ➢ No activities which give negative impacts are planned.
5	Noise and vibration	B-	B-	[Construction Stage] ➢ Noise and vibration from heavy machines and vehicles are expected. ➢ Noise and vibration during road works are expected. [Operation Stage] ➢ Noise from substations is expected.
6	Ground subsidence	D	D	No activities which give negative impacts are planned.
7	Offensive odors	B-	D	[Construction Stage] ➢ Odor from wastes and sewage from construction sites are expected. [Operation Stage] ➢ No activities which give negative impacts are planned.

8	Bottom sediment	D	D	No activities which give negative impacts are planned.
Natural Environment				
9	Protected areas	B-	B-	[Construction stage] ➢ Activities in areas close to protected area may be expected. ➢ If transmission line crosses a biological corridor, division of the protected area is expected. [Operation Stage] ➢ Although impacts are expected to be small, maintenance activities may give impacts to protected area if the project is located close to protected area.
10	Ecosystem	B-	B-	[Construction stage] ➢ Impacts on terrestrial ecosystems outside protected areas are expected. [Operation Stage] ➢ Impacts on terrestrial ecosystems outside protected areas are expected. ➢ Although impacts are expected to be small, collisions and electrocutions of animals and birds are expected.
11	Hydrology	D	D	No activities which give negative impacts are planned.
12	Geographical features	B-	B-	[Construction stage] ➢ Construction works in mountainous areas may cause soil erosions and slope failures. [Operation Stage] ➢ Some transmission tower sites and access roads are prone to soil erosions and slope failures.
Social Environment				
13	Resettlement/ Land Acquisition	C	D	[Planning stage] ➢ Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined. [Operation Stage] ➢ No activities which give negative impacts are planned.
14	Poor people	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.

15	Ethnic minorities and indigenous peoples	C	C	There are many dialects (or languages) and cultures in Bangladesh. Although details of impacts (including their existences) are not known, the Project understands these cultures well and develops the plan of the country to achieve a balanced society.
16	Local economies, such as employment, livelihood, etc.	B+	C	[Construction stage] ➢ Employment by the Project is expected. [Operation Stage] ➢ Unemployment may become an issue after the completion of the construction.
17	Land use and utilization of local resources	B-	B-	[Construction stage] ➢ Cash crops such as fruit trees may be cut down under transmission lines and at tower sites. [Operation Stage] ➢ Restrictions are imposed under transmission lines.
18	Water usage	D	D	No activities which give negative impacts are planned.
19	Existing social infrastructures and services	B-	C	[Construction stage] ➢ Although impacts are expected to be small, impacts on road traffic are expected. [Operation Stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
20	Social institutions such as social infrastructure and local decision-making institutions	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
21	Misdistribution of benefits and damages	B-	B-	[Construction stage] ➢ Cash crops such as fruit trees may be cut down under transmission lines and at tower sites. [Operation Stage] ➢ Restrictions are imposed under transmission lines.

22	Local conflicts of interest	B-	B-	[Construction stage] ➢ Cash crops such as fruit trees may be cut down under transmission lines and at tower sites. [Operation Stage] ➢ Restrictions are imposed under transmission lines.
23	Cultural heritage	B-	C	[Planning stage] ➢ Impacts on movable cultural properties, intangible cultural heritages and cultural sites are expected. [Operation Stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.
24	Landscape	B-	B-	[Planning stage] ➢ Impacts on movable cultural properties, intangible cultural heritages and cultural sites are expected. [Construction stage] ➢ Impacts by construction works are expected. [Operation Stage] ➢ Impacts by soil erosions and slope failures at tower sites and along access roads are expected depending on topography and geology.
25	Gender	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
26	Children's rights	C	C	Details of impacts (including their existences) are not known because specific plans are not available, however impacts will be evaluated again when the content of the Project is determined.
27	Infectious diseases such as HIV/AIDS	B-	C	[Construction stage] ➢ Infectious diseases may be spread because of the inflow of external workers. [Operation Stage] ➢ No particular negative impact by the Project is expected, however impacts will be evaluated again when the content of the Project is determined.

28	Working conditions (including occupational safety)	B-	B-	[Construction stage] ➢ Accidents of workers are expected. [Operation Stage] ➢ Accidents such as traffic accidents during maintenance activities are expected.
29	Accidents	B-	B-	[Construction stage] ➢ Accidents and traffic congestions by construction works are expected. ➢ Accidents to neighboring residents including electrocution are expected. [Operation Stage] ➢ Short-circuit accidents at substations and fires accompanying short-circuit accidents are expected. ➢ Slope failures along access roads are expected depending on topography and geology. ➢ Accidents such as traffic accidents during maintenance activities are expected.
Other				
30	Trans-boundary impacts or climate change	B-	B+	[Construction stage] ➢ Emissions from forest clearance are expected. ➢ Emissions from heavy machines and vehicles are expected. [Operation Stage] ➢ Positive impact is expected because of reduction of transmission line losses.

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C: Extent of positive/negative impact is unknown. A further examination is needed, and the impact could be clarified as the study progress.

D: No impact is expected

9. Result of the consultation with recipient government on environmental and social consideration including roles and responsibilities.

They have basically understood the essence of JICA Guidelines.

10. Terms of Reference for Environmental and Social Considerations

SEA will be implemented in the Project at master plan level according to JICA Guidelines. Its procedures and methods will be discussed and decided through coordination among the stakeholders during the Project. Terms of Reference (TOR) for the study of environmental and social considerations to be conducted in this project are presented as follows.

(1) Review the existing development plans (upper level/related plans), development projects, studies, and policies.

(2) Examine the issues on environmental and social aspects for energy and power development planning.

(3) Confirmation of legal framework and institution of the GOB on environmental and social considerations, and SEA cases in Bangladesh.

1) Laws, regulations and standards related to environmental and social considerations (environmental impact assessment, resettlement, public participation, information disclosure and others).
2) Gaps between the JICA Guidelines and legal framework of Bangladesh on environmental and social considerations.
3) Outlines of relative agencies and institutions responsible for the implementation of the Project.
4) SEA cases conducted in Bangladesh

(4) Examine the methods to implement the SEA for the Project

(5) Examine the plans, and configure alternatives, which are subject to the SEA.

(6) Study the baseline situation on environmental and social aspects of the plans subject to the SEA.

(7) Conduct scoping (clarify extremely important items on environmental and social impacts and its evaluation methods at the time of decision making such as policy, plan, and program levels).

(8) Predict the environmental and social impacts of each alternative based on the results of scoping.

(9) Compare and evaluate the alternatives including ‘without project’ option from technical, financial, and impacts of environmental and social points of view, and select the optimal plan.

(10) Study the mitigation measures in the optimal plan (to be avoided, minimized and compensated).

(11) Study the monitoring method based on the mitigation measures.

(12) Support to hold stakeholder consultations hosted by the counterparts, and incorporate the outputs into the Project.

11. Other relevant information

None.