Environmental Assessment and Review Framework

August 2013 (updated version)

IND: Rajasthan Renewable Energy Transmission Investment Program

Prepared by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), Government of Rajasthan for the Asian Development Bank.

ABBREVIATIONS

ADB	–	Asian Development Bank
CEA	–	Central Electricity Authority
DC or D/C	–	Double Circuit
DPR	–	Detailed Project Report
EA	–	Executing Agency
EARF	–	Environmental Assessment and Review Framework
EIA	–	Environmental Impact Assessment
EMoP	–	Environmental Monitoring Plan
EMP	–	Environmental Management Plan
EHV	–	Extra High Voltage
ESC	–	Environment and Social Cell, RRVPNL
GHG	–	Green House Gas
GOR	–	Government of Rajasthan
GoI	–	Government of India
GRM	–	Grievance Redress Mechanism
RSPCB	–	Rajasthan State Pollution Control Board
RRVPNL	–	Rajasthan Rajya Vidyut Prasaran Nigam Limited
IA	–	Implementing Agency
IEE	–	Initial Environmental Examination
LILO	-	Line – in- Line- out
MFF	–	Multi-tranche Financing Facility
MOEF	–	Ministry of Environment and Forests, Government of India
PCB	–	Poly Chlorinated Biphenyl
PGCIL	–	Power Grid Corporation of India Limited
PMU	–	Project Management Unit
ROW	–	Right of Way
RP	–	Resettlement Plan
SF_6	–	Sulphur Hexafluoride

WEIGHTS AND MEASURES

ha (hectare)	–	Unit of area
km (kilometer)	–	1,000 meters
kV	–	kilovolt (1,000 volts)
kW	–	kilowatt (1,000 watts)
MW	–	Mega Watt

A. Introduction

1. India is blessed with abundant solar energy and if harnessed efficiently, the country is capable of producing trillion-kilowatts of electricity. Solar energy is extremely beneficial as it is non-polluting and its generation can be decentralized. Rajasthan, the largest state in the country, covers a tenth of the area and five percent of the country's population, and has access to only one percent of the country's water resources. Rajasthan is bestowed with significant amount of solar energy potential and an overwhelming response from Developers/Independent Power Producers (IPPs) has already been received for establishing solar power projects. Rajasthan government is fully committed to the promotion of solar energy.

2. Achieving the ambitious Jawaharlal Nehru National Solar Mission (JNNSM) target for 2022 of 20,000 MW is envisaged through the promotion and establishment of solar parks with dedicated infrastructure through state governments. These state governments will streamline the project development timeline by letting government agencies directly handle land acquisition and all necessary permits, and provide dedicated common infrastructure (site preparation, levelling, power evacuation arrangements, water pipelines, access roads, common security, smart grid facilities etc.). This approach will facilitate the accelerated installation of solar power generation capacity by addressing issues faced by decentralized projects. Government of India requested Asian Development Bank (ADB) to provide comprehensive support for the development of solar park and green grid development in the states of Gujarat, Maharashtra and Rajasthan. In this program, ADB has been requested to finance (i) solar power generation plants, (ii) associated facilities for solar parks including transmission evacuation and operation center, (iii) urban grid connected solar PV distribution, and (iv) green grid (including smart HVDS) to stabilize power flows and enhance energy efficiency.

3. Government of Rajasthan (GOR) has identified the Bhadla solar park with over 10,000 hectare in Phalodi tehsil of Jodhpur district, Rajasthan (to be developed in phases) to accommodate both solar photovoltaic (PV) power plants and concentrated solar power (CSP) plants. With ADB support, a master plan is being developed to ascertain the feasibility of the chosen location at Bhadla followed by the preparation of a detailed project report that includes laying out of plots, planning for common infrastructure facilities, developing cost estimates and financing plans.

4. Development of infrastructure to evacuate and transmit such a large quantum of renewable energy through power evacuation system has its challenges including (i) the development of a solar park of nearly 250 MW and overall renewable energy evacuation at a gigawatt scale, (ii) cost recovery from consumers in Rajasthan or other Indian states given significantly low load factors for infrastructure transmitting renewable energy compared to conventional fossil fuels, and (iii) technical challenges related to evacuation of such a large quantum of intermittent power in a stable and reliable manner that requires the use of innovative stabilizing equipment.

5. The Rajasthan Rajya Vidyut Prasaran Nigam (RRVPNL) is the state transmission utility (STU) of Rajasthan. RRVPNL is responsible for the planning, development, operation and maintenance of the transmission facilities at 132 kV and above in Rajasthan. RRVPNL has developed a detailed project report to evacuate solar and wind energy from a high renewable energy potential zone identified in Western Rajasthan. While some of the power will be consumed in the state by the distribution companies, a large part of this power would be wheeled to other states to support them to meet their renewable power procurement obligations.

Program to be assessed

6. The investment program to be supported by ADB will contribute to economic development in Rajasthan through expanded power supplies from clean energy sources, and support a sustainable state electricity sector in the state. The Rajasthan Renewable Energy Transmission Investment Program (RRETIP) will support the addition of clean energy in the grid in Western Rajasthan.

7. Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL) will be the Executing Agency (EA) along with the Energy Department, Government of Rajasthan. The cost breakup of the proposed tranches is shown in **Table 1**.

Table 1: Tranche wise breakup

	Amount ($ million)				
Source	**Tranche 1**	**Tranche 2**	**Tranche 3**	**Total**	**Share of Total** (%)
Asian Development Bank	62.0	150.0	88.0	300.0	37.5
Clean Technology Fund[a]	90.0[b]	70.0	40.0	200.0	25.0
Government of Rajasthan (including NCEF)	127.0	104.0	69.0	300.0	37.5
Total	**279.0**	**324.0**	**197.0**	**800.0**	**100.0**

[a] Under the Climate Investment Fund
[b] This includes a $ 2 million technical assistance grant from the Asian Development Bank (ADB) Clean Technology Fund associated with project 1 to support the implementation of the program.
Source: Asian Development Bank estimates.

8. The RRETIP will finance the following project components–

a. the construction of three grid substations (400/220/132 kilo Volt) and associated facilities at Bhadla, Ramgarh and Jaisalmer;
b. the construction of associated automation and control infrastructure,
c. the construction of nine grid substations (9 220/132 kV) and associated facilities at Bap, Kanasar, Chhatrail, Pokaran, Kolayat, Ramdev Nagar, Badisid, Aau and Bajju;
d. the augmentation of four 400 kilo Volt (kV) grid substations at Akal, Jodhpur, Barmer, Bikaner;
e. the upgradation of 3 substations to 132 kV in Bhadla;
f. the construction of nearly 1850 km. of 400 kV, 220 kV and 132 kV of transmission lines in Western Rajasthan by RRVPNL; and
g. non-physical outputs which include improving institutional capacity and effectiveness, including planning, project management, community involvement, financial management and improved monitoring and reporting.

9. Consistent with ADB's Safeguard Policy Statement (SPS 2009), this Environmental Assessment and Review Framework (EARF) shall apply to all tranche subprojects to be prepared after MFF approval. Tranche 1 of the MFF was categorized “B” for environment, and Initial Environmental Examination (IEE) has been prepared, which will be approved together with the MFF. As such, this EARF shall be applied to Tranche 2 and 3 projects which yet to be finalised after the MFF is approved.

B. Assessment of Legal Framework and Institutional Capacity

Environmental Regulatory and Policy Framework for Project Selection

10. The purpose of this Environmental Assessment and Review Framework (EARF) is to guide the project proponent to comply with all national environmental laws and regulations and ADB Safeguard Policy Statement 2009 for all future tranches 2 and 3 under the program. The EARF outlines the policy, procedures, and institutional requirements for preparing subsequent projects.

11. GoI, GoR and ADB’s environment policies and procedures apply to all projects. Power transmission projects normally are classified by ADB as Category B, and distribution

projects are normally classified as Category B or C. Category A may apply to projects located in environmentally sensitive areas1. For each major investment project, an Initial Environmental Examination (IEE) will be prepared by RRVPNL following ADB's Safeguard Policy Statement, 2009, Environmental Assessment Guidelines, 2003 and applicable National environmental laws and regulations. Based on these IEE reports, the environmental management plan (EMP) and a corresponding budget will be prepared for each project.

1. National/Local Government Environment Classification

12. Under the GoI Environment Impact Assessment (EIA) Notification 2009, the environmental classification of projects is determined by Ministry of Forest and Environment (MoEF), GoI and there are two possible outcomes:

Category A: A project is classified as Category A if it is likely to have significant negative impacts and is thus one of the types of project listed in this category in the EIA Notification. Such projects require EIA, plus Environmental Clearance (EC) from MoEF;

Category B: A project is classified as Category B if it is likely to have fewer negative impacts and is listed in this category in the EIA Notification. These projects require EC from the State Environment Impact Assessment Authority (SEIAA), who classify the project as B1 (requiring EIA) or B2 (no requiring EIA), depending on the level of potential impacts. Projects classified as B2 require no further study.

13. As per EIA Act 2009, power transmission projects are not listed as environmental sensitive project and no clearance is required from Rajasthan State Pollution Control Board (RSPCB) or MoEF. Clearance from Forest department is required only in case where project is constructed on forest land or requires cutting of any forest tree/trees or passes through buffer zone of a sanctuary and/or national park.

14. Some of the relevant GoI Regulations and Acts are as follows:

(i) The Electricity Act, 2003
(ii) The Water (Prevention and Control of Pollution) Act, 1974, amended 1988
(iii) The Water (Prevention and Control of Pollution) Rules, 1975
(iv) The Air (Prevention and Control of Pollution) Act 1981, amended 1987
(v) The Air (Prevention and Control of Pollution) Rules, 1982
(vi) The Environment (Protection) Act, 1986, amended 1991 and including the following Rules/Notification issued under this Act.
- The Environment (Protection) Rules, 1986, including amendments
- The Municipal Solid Wastes (Management and Handling) Rules, 2000
- The Hazardous Wastes (Management and Handling) Rules, 2003
- The Hazardous Wastes (Management, Handling and Trans-boundary Movement) Rules 2009
- The Bio-Medical Waste (Management and Handling) Rules, 1998
- Noise Pollution (Regulation and Control) Rules, 2000,
- Wild Life (Protection) Amendment Act, 2002
- Ozone Depleting Substances (Regulation & Control) Rules, 2000.
- The Biological Diversity Act, 2002;
- The Environment Impact Assessment Notification, 1994; amended up to 2009;
- Batteries (Management & Handling) Rules, 2001
- The Environmental Clearance Notification, 1994

(vii) Noise Pollution (Regulation and Control) Rules, 2000

[1]Environmentally-sensitive areas include National Parks, Wildlife Sanctuaries, Bio-reserve zones, Eco Sensitive Zones, or wetlands as declared by GoI and areas declared as heritage sites. Environment and wildlife Department's approval is required for right-of-way and sites located in reserved forests, wildlife preserves, national parks, and other designated sensitive areas

(viii) The Indian Wildlife (Protection) Act, 1972, amended 1993
(ix) The Wildlife (Protection) Rules, 1995
(x) The Indian Forest Act, 1927
(xi) Forest (Conservation) Act, 1980, amended 1988 (National Forest Policy, 1988)
- Forest (Conservation) Rules, 1981 amended 1992 and 2003
- Guidelines for diversion of forest lands for non-forest purpose under the Forest (Conservation) Act, 1980

(xii) The National Environmental Appellate Authority Act, 1997
(xiii) The National Green Tribunal Act, 2010

2. Other Relevant Acts of Government of Rajasthan

- The Rajasthan Monuments, Archaeological Sites and Antiquities Act, 1961, Amended by Raj. Act No. 6 of 2006.
- The Rajasthan Land Acquisition Act, 1953, Amended by Rajasthan Act Nos. 27 of 1957, 40 of 1960, 8 & 21 of 1962, 22 of 1966, 15 of 1981 and 8 of 1987.
- The Rajasthan Religious Buildings and Places Act, 1954, Amended by Rajasthan Act Nos. 27 of 1957 and 8 of 1962.
- The Rajasthan Irrigation and Drainage Act, 1954, Amended by Rajasthan Act Nos. 21 of 1960 and 8 of 1962.
- The Rajasthan Agricultural Lands Utilization Act, 1954, Amended by Rajasthan Act Nos. 27 of 1957, 28 of 1960 and 8 of 1962.
- The Rajasthan Forest Act, 1953, Amended by Rajasthan Act No.27 of 1957.
- The Rajasthan Land Revenue Act, 2003.

15. **Annexure 1** gives the GOI and local regulatory requirements and procedures followed by RRVPNL.

3. Asian Development Bank's Environment Classification

16. The ADB's Safeguard Policy Statement (SPS), 2009 is applicable to all projects funded under the MFF. These projects can be categorized as A, B, C or FI.

4. Equivalence of ADB SPS 2009 with Government of India laws, regulations

17. Table 2 provides a brief write up on the equivalence of the current GoI Environmental Rules and Regulations and ADB Safeguard Policy Statement 2009. This equivalence table is taken from ADB's document - TA 6285-REG: Strengthening Country Safeguard Systems - Preliminary Country Safeguard Review for India: Environmental Safeguard (February 2011).

Table 2: Equivalence of the GoI Environmental Rules and Regulations and ADB Safeguards Policy Statement 2009

No	ADB's SPS 2009	Indian Laws	Equivalence	Comments	Changes recommended for full equivalence
1	Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment, so that appropriate studies are undertaken commensurate to the significance of potential impacts and risks.	The Environment (Protection) Act, 1986. National Environmental Policy 2006. The Environment Impact Assessment Notification, 1994 and amended up to 2009. National Environmental (Ambient Air, Water Quality and Noise) Standards, CPCB.	Full	The Environment (Protection) Act, 1986. National Environmental Policy 2006. The Environment Impact Assessment Notification, 1994 and amended up to 2009. National Environmental (Ambient Air, Water Quality and Noise) Standards, CPCB.	
2	Conduct an environmental assessment for each proposed project to identify potential impacts and risks on physical, biological, socio-economic (including health and safety), and physical cultural resources in the context of the project's area of influence. Assess potential trans-boundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.	The Environment Impact Assessment Notification, 1994 and amended up to 2009.	Partial	The EPA and EIA Notification do not require that an environmental assessment address impacts on physical cultural resources, trans-boundary and global impacts, including climate change. Nor are there any provisions for use of strategic environmental assessment where appropriate.	The legal framework should be revised to require that the EIA process addresses impacts on physical cultural resources, trans-boundary and global impacts, including climate change and to use strategic environmental assessment where appropriate.
3	Examine financially and technically feasible alternatives to the project location, design, technology and components, their potential environmental and social impacts, and document the rationale for selecting the particular alternative(s) proposed, where relevant. The no project alternative will be also considered.	National Environmental Policy, 2006. The Environment Impact Assessment Notification, 1994 and amended up to 2009.	Partial	Although the EIA Notification requires that the EIA document examine alternatives and provide an overall justification for the project it does not require consideration of the environmental implications of the "no project" alternative.	The legal framework should be revised to require consideration of the no project alternative as part of the EIA process and documentation.
4	Avoid and, where avoidance is not feasible, minimize, mitigate and/or offset for adverse impacts and enhance positive impacts through environmental planning and management. Prepare an environmental	National Environmental Policy, 2006.	Partial	Although the EIA Notification requires that the EMP address the "administrative aspects" of proposed that mitigative measures, it does not require	The legal framework should be revised to require that the EMP address reporting requirements, capacity development and training measures,

No	ADB's SPS 2009	Indian Laws	Equivalence	Comments	Changes recommended for full equivalence
	management plan (EMP) or equivalent planning document(s) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates and performance indicators.			that the EMP address reporting requirements, capacity development and training measures, implementation schedule, cost estimates or performance indicators	implementation schedule, cost estimates or performance indicators
5	Carry out free, prior and informed consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including project-affected people and concerned NGOs early in the project preparation and ensure that their views and concerns are made known and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address environmental assessment-related issues. Establish a grievance mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.	The Environment Impact Assessment Notification, 2006 and amended up to 2009. The National Environment Appellate Authority Act, 1997	Partial	The EIA Notification is fully equivalent with this Policy Principle with the exception of any specific provisions to ensure women's participation in the consultation process	The legal framework should be revised to include specific provisions to ensure women's participation in the EIA consultation process
6	Disclose draft environmental assessments (including EMP) before project appraisal, in a form, manner and language(s) accessible to affected people and other stakeholders.	The Environment Impact Assessment Notification, 1994 and amended up to 2009.	Full	Executing Agency to facilitate resolution of affected people's concerns. Component of IEE report. Grievance redress mechanism-addressed in accordance with the ADB requirement.	
7	Implement the EMP and monitor its effectiveness. Document monitoring results, including development and implementation of corrective actions, and disclose periodic	Public consultation and disclosure as per Indian EIA Act 2006. The Environment (Protection) Act, 1986	Partial	There is no requirement for public disclosure of EMP monitoring results. Public consultation and disclosure	The legal framework should be revised to include a requirement for periodical disclosure of monitoring results

No	ADB's SPS 2009	Indian Laws	Equivalence	Comments	Changes recommended for full equivalence
	progress reports.			as per Indian EIA Act 2006. ADB's SPS 2009 requires disclosure of EIA[2], IEE, Environmental Assessment and Review Framework (EARF) and Environmental Monitoring Reports	
8	Do not implement project activities that involve or are likely to result directly or indirectly in the significant conversion or degradation of critical habitats. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. If the project has the potential to adversely impact non-critical habitats, proceed only if there are no technically and financially feasible alternatives, overall benefits from the project substantially outweigh the environmental costs, and any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development and management of renewable natural resources.	Environmental Protection Rules 1986 (EPR) Indian Forest Act of 1927 (Forest Act) The Forest (Conservation) Act, 1980 The Wild Life (Protection) Act, 1972 Biodiversity Act of 2002 The Biological Diversity Act, 2002	Full	ADB requires Environmental Monitoring Plan for monitoring of mitigation of environmental impacts. State Environmental Appraisal Committee (SEAC) releases guidelines and recommendations for the mitigating environmental impacts.	
9	Application of pollution prevention and control technologies	The Water (Prevention and Control of Pollution) Act, 1974 as amended; The Air (Prevention and Control of Pollution) Act, 1981 as amended Environmental Standards published by Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB) Water (Prevention And Control Of Pollution) Rules, 1975 Insecticide Act of 1968	Full	ADB requires Environmental Monitoring Plan for monitoring and mitigation of environmental impacts and risks. SEAC releases specific guidelines and recommendations for the mitigation of environmental impacts relevant to each sub	

[2] a draft full EIA (including the draft EMP) at least 120 days prior to ADB Board consideration, and/or environmental assessment and review frameworks before project appraisal,

No	ADB's SPS 2009	Indian Laws	Equivalence	Comments	Changes recommended for full equivalence
		Ministry of Commerce and Industry (Department of Commerce) Directorate General of Foreign Trade Public Notice No 72 (Re-2003)/2002-2007, July 2004		project	
10	Provide workers with safe and healthy working conditions, and prevent accidents, injury, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not feasible, to minimize the adverse impacts and risks to the health and safety of the local communities.	The Environment Impact Assessment Notification, 1994 and amended up to 2009. National Policy on Safety, Health and Environment at Work Place The Public Liability Insurance Act, 1991	Full	Appropriate extent of workers safety and the health discussed under the EMP	
11	Conserve physical cultural resources (PCR) and avoid their destruction or damage by using field based surveys with qualified and experienced expert(s) during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	Environmental Protection Rules 1986 The Environment Impact Assessment Notification, 1994 and amended up to 2009. The Ancient Monument and Archaeological Sites and remains (Amendment and Validation) Act, 2010	Partial	There are no provisions that require pre-approved procedures for "chance finds" for chance finds within the EIA or PCR legal framework.	The EIA Notification should be revised to include a provision requiring pre-approved procedures for "chance finds" of PCR.

5. Institutional Capacity

18. RRVPNL has implemented World Bank program on power transmission recently past and implemented programs followed an Environmental Social Management Framework (ESMF). The normal work practise of RRVPNL involves following all GOI and donor norms on environment and social safeguards compliances. The borrower has adequate in-house institutional capacity in implementing national laws and Asian Development Bank (ADB) requirements. The capacity development needs will be identified and included in tranche 1. Some of the nonphysical investment include: Non-physical outputs would include improving institutional capacity and effectiveness, including planning, project management, community involvement, financial management and improved monitoring and reporting.

19. This EARF has been developed and agreed with RRVPNL to ensure that the Program complies with the provisions of ADB's SPS 2009 and Indian laws (described in section B above.) The EARF provisions shall guide RRVPNL in the selection, screening and categorization, environmental assessment, and preparation and implementation of safeguard plans (such as an environmental management plan or EMP) of Tranche 2 and 3 projects. The preparation of environmental assessment documents by RRVPNL shall follow the procedures outlined in this EARF. Since the environmental assessment reports and environmental management plans to be prepared for subsequent tranches are the Borrower's documents, these documents shall be officially endorsed by RRVPNL and submitted to ADB.

C. Anticipated Environmental Impacts

20. Table 3 provides a list of both ADB funded and RRVPNL funded projects for all Tranches. The ADB share for 1st tranche finance will be USD 150 million.

Table 3: Investment Projects Funded under RRETIP

S No	Items
1	400 kV D/C Ramgarh (Jaisalmer district) to Akal (Jaisalmer district) line (Twin Moose conductor) - 100 km transmission line.
2	400 kV D/C Ramgarh – Bhadla transmission line (Twin Moose conductor) – 180 km transmission line.
3	400 kV D/C transmission line from 400/220 kV grid substation Bhadla to LILO point at 400 kV S/C Jodhpur-Merta transmission line (Twin Moose conductor) – 160 km.
4	400/220 kV, 2 X 500 MVA grid substation GSS at Ramgarh (Jaisalmer district) along with 400 kV, 1x125 MVAR, 400 kV Shunt Reactor (Bus type) and 2x50 MVAR Shunt Reactor (line type) for 400 kV D/C Ramgarh-Bhadla transmission line.
5	400/220 kV, 2 X 315 MVA grid substation GSS at Bhadla (Jodhpur district) along with 400 kV, 1x125 MVAR Shunt Reactor (Bus type) and 4x50 MVAR, 400 kV Shunt Reactors (Line type) for Bhadla ends of 400 kV D/C Bhadla-Bikaner transmission line, 400 kV LILO Jodhpur-Merta at Bhadla transmission line and 400 kV D/C Ramgarh - Bhadla transmission line.
6	Augmentation of 400 kV GSS Akal by installation of 400/220 kV, 1 X500 MVA Transformer along with 400 kV, 1x125 MVAR Bus Reactor and 400 kV, 2x50 MVAR Shunt Reactor.
7	Augmentation at 400 kV GSS Bikaner along with 1x125 MVAR, 400 kV Bus Reactor at 400 kV GSS Bikaner and 400 kV Bays for 400 kV D/C Bhadla-Bikaner line and 400 kV D/C Bikaner-Sikar (PGCIL) line at Bikaner end of the lines.
8	Transformer Package for Ramgarh, Bhadla and Akal.
9	Shunt Reactors Package for Ramgarh, Bhadla, Bikaner and Akal.
10	400 kV conductor for 400 kV lines mentioned at above Sr. No. 1,2 and 3.
11	Charging of 132 kV line from PS_No.5 to PS_No.1 on 132 kV voltage level via 132 kV PS_No.2 GSS, 132 kV PS_No.3 GSS and 132kV PS_No.4 GSS.
1	220/132kV, 3x160 MVA with 132/33 kV, 2x40/50 MVA grid substation GSS at Ramgarh along with 220 kV, 132kV and 33 kV bays.
2	220/132kV, 3x160 MVA with 132/33 kV, 2x40/50 MVA grid substation GSS at Bhadla along with 220 kV, 132kV and 33 kV bays.
3	**220 kV GSS at Bap and associated 220 kV & 132kV lines:**
(i)	220/132kV, 2x160 MVA & 132/33 kV, 2x40/50 MVA GSS at Bap (Distt. Jodhpur)
(ii)	LILO of 220 kV Barsingsar LTPS-Phalodi line at Bap.
(iii)	220 kV D/C Bap-Bhadla line.
4	**220 kV GSS at Kanasar and associated 220 kV & 132kV lines**
(i)	220/132kV, 2x160 MVA & 132/33 kV, 2x40/50 MVA GSS at Kanasar (Distt. Jodhpur)
(ii)	220 kV D/C Bhadla- Kanasar line.
(iii)	LILO of 132kV PS1-PS2 line at proposed 220 kV GSS at Kanasar.
(iv)	LILO of 132kV PS2-PS3 line at proposed 220 kV GSS at Kanasar.

S No	Items
5	Up-gradation of PS No. 2 to 132kV grid substation with 132/33 kV, 2x20/25 MVA Transformers with associated 132kV line.
6	Up-gradation of PS No. 3 to 132kV grid substation with 132/33 kV, 2x20/25 MVA Transformers.
7	Charging of 132 kV line from PS_No.5 to PS_No.1 on 132 kV voltage level via 132 kV PS_No.2 GSS, 132 kV PS_No.3 GSS and 132kV PS_No.4 GSS.
1	400 kV D/C Akal-Jodhpur (New) line (Quad Moose).
2	400 kV D/C Bhadla-Bikaner line (Quad Moose).
3	400 kV D/C Bikaner-Sikar (PGCIL) line (Twin Moose).
4	LILO of one circuit of 400 kV D/C Raj West-Jodhpur line at 400 kV GSS Jodhpur (New) (Twin Moose).
5	400 kV conductor for 400 kV lines mentioned at above Sr. No. 1 & 2.
6	400 kV conductor for 400 kV lines mentioned at above Sr. No. 3 & 4.
7	Smart Grid Applications and Optical Fiber Cable System for 220 kV & 132kV Schemes already approved under Main transmission System for New solar & wind power plants.
1	**220 kV GSS at Chhatrail along with associated 220 kV lines.**
(i)	(a) 220/132 kV, 1x160 MVA and 132/33 kV, 1x20/25 MVA GSS at Chatrail (Jaisalmer) (b) 2 Nos. 220 kV bays at Ramgarh (400 kV GSS).
(ii)	220 kV D/C Chatrail-Ramgarh (U/C 400 kV GSS) line
2	**220 kV GSS at Pokaran along with associated 220 kV lines.**
(i)	220/132 kV, 1x160 MVA and 132/33 kV, 1x20/25 MVA GSS at Pokran (New loc.).
(ii)	LILO of both circuits of U/C 220 kV D/C Ramgarh GTPP – Dechu line at Pokaran (5kM D/C each x 2 = 10kM D/C).
(iii)	LILO of existing 132 kV S/C Chandan-Pokaran line at proposed 220 kV GSS Pokaran.
3	**220 kV GSS at Kolayat along with associated 220 kV lines**
(i)	(a) 220/132 kV, 1x160 MVA and 132/33 kV, 1x20/25 MVA GSS at Kolayat (New loc.). (b) 2 Nos. 220 kV bays at 220 kV GSS Gajner.
(ii)	220 kV D/C Gajner (U/C 220 kV GSS)-Kolayat line.
(iii)	LILO of existing 132 kV S/C Kolayat-Bajju line at proposed 220 kV GSS Kolayat.
4	**220 kV GSS at Ramdev Nagar along with associated 220 kV lines.**
(i)	220/132 kV, 1x160 MVA and 132/33 kV, 1x20/25 MVA GSS at Ramdev Nagar (Phalodi).
(ii)	LILO of one circuit of U/C 220 kV D/C Dechu-Phalodi line at proposed 220 kV GSS Ramdev Nagar.
5	5 numbers 132kV GSSs along with 132kV approx. 20kM D/C line around 220 kV GSSs as per solar potential in respective areas @ Rs. 19.20 Crores per scheme.
1A	400/220 kV, 2 X 500 MVA GSS at Jaisalmer-2 along with 1x125 MVAR , 400 kV Bus Type Reactor.
1B	400 kV Terminal Bay Equipment at 400/220 kV GSS Akal 1 (for termination of 400 kV S/C Akal 1 - Jaisalmer 2 line at Akal 1 end).
1C	400 kV Terminal Bay Equipment at 400/220 kV GSS Barmer (for termination of 400 kV D/C Jaisalmer 2 - Barmer line at Barmer end).
3	Transformer Package for Jaisalmer-2.
4	Shunt Reactors Package for Jaisalmer-2.
5	400 kV D/C Jaisalmer-2 -Barmer line.
6	400 kV S/C Akal(1)- Jaisalmer-2 line.
7	400 kV D/C Barmer-Bhinmal (PGCIL) line (Twin Moose).
8	400 kV conductor for 400 kV lines mentioned at above Sr. No. 5, 6 and 7.
9	Smart Grid Applications and Optical Fibre Cable System for 220 kV & 132kV Schemes already approved under Main transmission System for New solar & wind power plants.
1	**220 kV GSS at Badisid along with associated 220 kV lines.**
(i)	(a) 220/132 kV, 1x160 MVA and 132/33 kV, 1x20/25 MVA GSS at Badisid. (b) 2 Nos. 220 kV bays at 220 kV GSS Bap.
(ii)	220 kV D/C Badisid-Bap (U/C 220 kV GSS) line.
(iii)	220 kV D/C Badisid - Aau (Proposed 220 kV GSS) line.
2	**220 kV GSS at Aau along with associated 220 kV lines.**
(i)	(a) 220/132 kV, 1x160 MVA and 132/33 kV, 1x20/25 MVA GSS at Aau. (b) 2 Nos. 220 kV bays at 220 kV GSS Baithwasia.
(ii)	220 kV D/C Aau - Baithwasia (U/C 220 kV GSS) line.
(iii)	LILO of existing 132 kV S/C Aau (132 kV GSS)-Phalodi line at proposed 220 kV GSS Aau.
3	**220 kV GSS at PS-1/Bajju along with associated 220 kV lines.**
(i)	(a) 220/132 kV, 1x160 MVA and 132/33 kV, 1x20/25 MVA GSS at PS_1(New location) / Bajju (New location). (b) 2 Nos. 220 kV bays at 400/220 kV GSS Bhadla.
(ii)	220 kV D/C PS_1 / Bajju - Bhadla (U/C 400 kV GSS) line.
(iii)	LILO of existing 132 kV S/C PS1-Bajju line at proposed 220 kV GSS PS_1 / Bajju.
4	5 numbers 132kV GSSs along with 132kV approx. 20kM D/C line around 220 kV GSSs as per solar potential in respective areas @Rs. 19.20 Crores per scheme.
(iii)	LILO of existing 132 kV S/C PS1-Bajju line at proposed 220 kV GSS PS_1 / Bajju.

GSS= Grid Substation

21. Table 4 provides performance targets for the investment program.

Table 4: Outcomes and Indicators

Outputs	Performance Targets and Indicators
1. Construction of power transmission lines	• transmission of power from solar parks and wind power projects to national grid • Nearly 1850 km of transmission lines enabling 4,240 MW of additional capacity to be transmitted

Outputs	Performance Targets and Indicators
2. Construction of grid substations	• Evacuation and supply of power in a reliable manner • Augmentation and construction of substations adding 6,575 MVA of additional transformation capacity
3. Smart grid applications	• Smart grid applications, control and and automation system

Source: Project Report for transmission system associated with evacuation of wind and solar generation from Jaisalmer, Barmer and Jodhpur Districts of Rajasthan, RRVPNL

22. Table 5 illustrates anticipated impacts on the environment for proposed program activities on project area.

Table 5: Potential Environmental Impacts

SNº	Environmental attribute	Potential impacts	Nature of impact	Magnitude of impacts		
				Low	Medium	High
A. Physical Resources						
.	Topography	Change in the surface features and present aesthetics due to the construction of the project.	Direct/Local/ irreversible		X	
2.	Climate	No impact on the climatic conditions	Direct/Local/ irreversible	X		
		Monitoring of SF_6 gas from Electrical Sub-stations.	Direct/Local/ irreversible	X		
B. Environmental Resources						
1.	Air Quality	Project will have marginal impact on air quality during the construction period due to increase in the dust emission.	Direct/Local/ reversible	X		
2.	Noise	Noise due to general construction activities.	Direct/Local/ reversible	X		
		Noise arising from corona noise from conductors.	Direct/Local/ reversible	X		
3.	Surface and Ground Water quality	Runoff from the construction site.	Direct/Local/ reversible	X		
		Domestic wastewater from construction sites.	Direct/Local/ reversible	X		
4.	Soils and Geology	Soil erosion due to tower erecting and clearing of vegetation in the RoW and access roads.	Direct/Local/ reversible		X	
		Damage due to seismic activity.	Direct/regional/ reversible	X		
C. Ecological Resources						
1.	Terrestrial Ecology	Loss of vegetation.	Direct/Local/ irreversible		X	
2.	Terrestrial Fauna Avifauna	Disturbance to the local fauna during construction.	Direct/Local/ reversible	X		
		Disturbance to the local fauna during operation.	Direct/Local/ reversible	X		
3.	Aquatic Ecology	No significant impacts envisaged.	Direct/Local/ reversible	X		
D. Human Environment						
1		Fires, explosion and other accidents at the route alignment of transmission line.	Direct/Local	X		
2.	Health and Safety	Exposure to electromagnetic fields	Direct/Local/ continuous	X		
3.	Agriculture	Permanent and temporary loss of agriculture land due to tower erection and due to access routes.	Direct/Local/ reversible	X		
4.	Socio-economics	Beneficial impacts job opportunities during construction phase	Direct/regional		X	
5.	Resettlement	Resettlement of any house falling along the RoW.	Direct/Local/ reversible	X		
6.	Cultural sites	No archaeological, historical or cultural important sites are affected by the construction of the lines.	Direct/Local/ reversible	X		
7.	Traffic and Transportation	Traffic congestion due to movement of construction vehicles.	Direct/Local/ reversible	X		
8.	Solid Waste Generation	Probability of Surface and ground water pollution.	indirect/Local/ reversible	X		

D. Environmental Assessment for Subprojects and/or Components

I. Screening and Classification

Selection Criteria

23. Additional projects proposed under the Program will be screened for compliance with selection criteria listed below prior to additional analysis. Projects that will be planned and implemented shall meet the following specific environmental criteria:

a. Projects will not be located within national parks, wildlife sanctuaries and nature reserves, or wetlands, unless unavoidable for technical reasons.
b. Any monument of cultural or historical importance is not affected by the project.
c. Projects do not create any threat to the survival of any community with special reference to tribal community.
d. Minimises impacts to large habitations, densely populated areas, crossings of national highways, railway lines, and airport areas, other EHV lines, hydrocarbon pipelines etc. to the extent possible.
e. Requires minimal clearing of any existing forest resources in the project area – wherever it is unavoidable, can be minimized and compensated as per regulatory criteria.
f. Any community utility services like playgrounds, schools, cemetery etc. and any other similar establishments etc. will not be adversely affected.

24. Projects that involve any one of the ten activities in the ADB Prohibited Investment Activities List (Appendix 5 of the Safeguard Policy Statement, 2009) shall be excluded.

25. As soon as sufficient information on projects is available, PMU will screen them to determine the environmental category by completing ADB's rapid environmental assessment (REA) checklist in Annexure 2 and submitting this to the ADB for review; and

26. Environmental categories will be assigned using the rapid environmental assessment checklist (as described in ADB Environmental Assessment Guidelines 2003) and adhering to the ADB Safeguard Policy Statement (SPS) 2009[3]. Some projects that do not conform to the above criteria shall be dropped or design changes may be suggested or required by ADB and GoI.

II. Preparation of environmental assessments and environmental management plans

1. Preparation of IEEs and EIAs

27. After categorization, IEE (or full EIA for category A projects) including an EMP with implementation budget will be prepared[4] according to both ADB and MoEF guidelines. IEE and EIA should be prepared in accordance with Safeguard Requirements 1 (SR 1) in Appendix 1 of the SPS 2009. The outline for preparation of an EIA, and the IEE is attached as Annexure 3. IEE and/or EIA describe the studies needed to be conducted to identify the potential environmental impacts.

28. IEEs and EIAs will need to be prepared and disclosed in accordance with ADB's Public Communication Policy 2011. For Category A projects, the EIA shall be made available to general public (in English and local language) and the ADB Board of Directors at least 120 days before the project approval by ADB[5].

29. Based on the environmental assessment of the project activities, an Environment

[3]ADB's Safeguards Policy Statement-2009 includes safeguard requirements for environment, involuntary resettlement and indigenous people.
[4] In the case of Category C, an environmental review is required.
[5]For Category A projects included in the list of projects, the EIA shall be made available to the ADB Board of Directors and publicly disclosed 120 days before Board Consideration.

Management Plan (EMP) will be developed for the project to mitigate the adverse environmental impacts. The EMP will include adverse impacts and likely mitigation measures, mitigation cost, monitoring requirements and responsible authorities to implement the EMP.

2. Responsibilities/Authorities of various agencies

a. Responsibility of RRVPNL

30. The proposed Project Management Unit (PMU) will have field based project implementation support from the field offices of RRVPNL. RRVPNL will be solely responsible for the implementation of the entire environmental assessment and review procedures as laid down by Government of India as well as this EARF document. This includes, among others, ensuring that the selection criteria are adhered to, the preparation of IEEs and/or EIAs be done in a timely and adequate manner, environmental monitoring and institutional requirements be fully met while public consultations be carried out satisfactorily. The RRVPNL will submit the Rapid Environmental Assessment (REA) Checklists, EIAs/IEEs for each tranche and submit monitoring reports of previous stage subprojects six monthly to ADB for review. RRVPNL will also be responsible for obtaining regulatory approval of the environmental protection agencies, if required as per GoI and GoR environmental regulations.

b. Responsibility of ADB

31. ADB will be responsible for regular review and timely approval of checklists, IEEs and/or EIAs. Technical guidance will be provided by ADB to RRVPNL as needed. ADB will also be responsible for reviewing regular monitoring reports and officially disclosing the IEEs and/or EIAs on its website.

3. Preparation of detailed design

32. Detailed design work for each additional project will follow the recommendations of the IEE/EIA. RRVPNL will review detailed designs before contracts are finalized and modifications will be incorporated if considered necessary. During the detailed design, the RRVPNL will update the EMP as deemed necessary. Certification to ADB that the detailed designs will comply with IEE/EIA (including EMP) recommendations will be required before contracts can be made effective. A tentative list of type of infrastructure projects under the 3 tranches of proposed MFF is presented in Table 6.

Table 6: Type of Projects and their components

Type of Sub projects	Main Components	Infrastructure
1. 400/220/132 kV grid Substations 2. 400/220/132 kV transmission lines 3. Facilities, buildings 4. IT infrastructure	Electrical and Mechanical Equipment	Control Room Panels etc. Switchyard equipment Transformers
	Steel/Concrete structures	transmission tower, conductors
	Civil Works	Buildings- control room, other equipment housing facilities

4. Preparation of Construction Contracts

33. Construction contracts will incorporate the Environmental Management Plan (EMP) for environmental safeguards compliance. RRVPNL shall prepare bidding documents that take into account the relevant provisions in the EMP to ensure contract documents reflect the relevant provisions of the EMP.

5. Monitoring During the Construction Stage

34. Monitoring contractor's implementation of the EMP as stipulated in the works contracts will be the responsibility of RRVPNL. Monitoring will be sufficient to confirm that construction activities meet contractual requirements, determine the environmental resources are not impacted negatively, and to determine the effectiveness of mitigation measures. Report to ADB and the relevant environmental agencies on a regular basis will be

provided by RRVPNL.

35. RRVPNL will be responsible for preparing the required environmental assessments and obtaining ADB concurrence prior to implementation. All applicable forest approvals must be in place prior to finalization of contracts and commencement of works.

6. Monitoring During Operations Stage

36. Compliance with EMP should be monitored on regular basis during operational stage to ensure minimal impact to environment.

7. Environmental Management and Monitoring Plan

37. An environmental management plan (EMP) will be developed for each project[6]. The summary matrix is developed on the basis of environmental analysis of project facilities and review of environmental impacts of typical power transmission projects. The mitigation measures for subsequent projects will be developed in the spirit of the principles agreed upon in this EMP framework. Any unanticipated consequence of the project will be documented.

38. Environmental monitoring will consist of routine systematic checking that the above environmental management measures have been implemented effectively during each stage of the project. Table 7 presents the summary environmental monitoring plan for projects to be funded, whereas Table 8 provides the Minimum Provisions for implementing the Environmental Management Plan (EMP).

Table 7: Summary Environmental Monitoring Plan

Environmental Monitoring Tasks[7]	Implementation Responsibility	Implementation Schedule
Pre-Construction Phase		
Verify project bidding documents to ensure EMP is included.	PMU, RRVPNL	Prior to issue of bidding documents
Monitor contractor's detailed alignment survey to ensure relevant environmental mitigation measures in EMP have been included.	RRVPNL through PMU	Prior to RRVPNL approval of Contractor's detailed alignment survey.
Verify detailed design of facilities to ensure standard environmental safeguards/mitigation measures (as identified in EMP) have been included.	PMU, RRVPNL	Prior to RRVPNL approval of contractor's detailed designs.
Approvals from GoR/GoI agencies such as forest department, roads, railways etc. as required before finalization.	RRVPNL	Prior to RRVPNL approval of contractor's detailed designs.
Construction Phase		
Regular monitoring and reporting of contractor's compliance with contractual environmental mitigation measures.	PMU through field office	Continuous throughout the construction period.
Operation and Maintenance		
Observations during routine maintenance inspections of transmission lines. RoW inspections will include monitoring implementation status of mitigation measures specified in EMP.	PMU through field office	As per RRVPNL inspection schedules
Handling of waste oil from transformers to be handled by certified agencies.	PMU through field office	As per GoI/GoR statutory requirements
Monitoring SF_6 leakages in GIS equipment.		

[6] EMP could vary from project to project due to variation in terms of environmental attributes and sensitivity on account of change in location.

[7] Monitoring of issues related to compensation of landowners for land acquisition and loss of production, etc. are addressed in the Resettlement Plan.

Table 8: Minimum Provisions for Implementing the Environmental Management Plan (EMP)[8]

Project Stage	Mitigation Measures	Monitoring Scope	Location	Measurements	Frequency	Responsibility	Cost
Pre- construction	Route survey to define alternative alignments	Any encroachment on reserved forests	All substation sites/selected locations along lines.	Field mapping with Global Positioning System (GPS) equipment	1-time survey to finalize design.	RRVPNL field office through route survey contractor	N/A
	Dust, equipment emissions, erosion, and noise control. Waste management	Incorporation of appropriate clauses in construction contracts	All construction contracts for all substation sites.	Field inspection to ensure that appropriate measures are implemented and facilities are installed	1 time in 3 months	RRVPNL to include in bidding documents, monitor through field office. ADB to verify through review of bidding documents.[9]	Included in construction contract
Construction	Dust, equipment emissions, and erosion control Waste management	Suspended particulate matter (SPM) Noise Water: pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), total suspended solids (TSS), Solid waste generation and disposal	All substation sites/selected locations along lines.	"Grab" samples for air and water Spot check for noise using portable monitoring device. Spot check for solid waste generation and disposal.	Every 6 months, beginning with initial activity, for total of 24 months. Monitoring will be extended if necessary. Spot checks for solid waste activities	Contractors to implement, field office to provide oversight via regular field inspections; ADB to review during project review missions RRVPNL to have responsibility for solid waste management	Included in construction contract
	Noise, Heat, GHG related Equipment emissions	SF_6 gas leakage, oil leakage		Periodic measurements of SF_6 gas, Noise and oil at substations sites			
Operations and Maintenance	GHG related Equipment emissions, and erosion control, Waste management	Same parameters as during construction period	All substations/ selected locations along lines	Spot checks based on visual inspections and any complaints along lines.	As necessary based on inspections and complaints[10]. Standard O&M schedules of RRVPNL for SF_6, Oil and Noise	RRVPNL through field office, ADB to verify during project review missions	Included in construction contracts. Thereafter in O&M schedules and standard operating procedures
	Monitoring of excessive Noise, Heat, Oil leakage, SF_6 leakage			Periodic measurements of SF_6 gas, Noise and oil in substations.			

ADB = Asian Development Bank, BOD = biochemical oxygen demand, DO = dissolved oxygen, SPM = suspended particulate matter, TSS = total suspended solids, SF_6 – Sulphur Hexafluoride gas, a highly non toxic GHG gas

[8] For issues related to compensation of landowners for land acquisition will be included in the resettlement plan.
[9] ADB will review documents and provide "no objection" at each stage of bidding, contract evaluation, and contract award.
[10] Parameters should be monitored if warranted based on visual observations or complaints.

E. Consultation, Information Disclosure, and Grievance Redress Mechanism

Consultation and Participation

39. Public consultations will be conducted with local community and potentially affected people during IEE and/or EIA preparation and is carried out on an on-going basis throughout the project cycle. The RRVPNL may hold public hearings[11] to determine or investigate any matter that it considers necessary in the public interest.

40. During public consultation sessions of the IEE study, the discussions with groups and individuals, and specially women will be conducted to make them aware of the proposed project. The project-affected community must be made aware of benefits, rights and responsibilities and should gain a reasonable knowledge about the potential grievances, which will arise in the future.

41. A community awareness program must be conducted one month prior to construction by the RRVPNL regarding the scope of the project, procedure of construction activities, utility of resources, identified impacts and mitigation measures. IEE results will also be communicated to the local community before commencement of construction.

Information Disclosure

42. RRVPNL will ensure that information will be disclosed through public consultation and more formally by making documents at locations in which they can be easily accessed by stakeholders. This would involve making draft summary environmental and social reports available at public locations and providing a mechanism for the receipt of comments. The documents may be made available through ADB and the RRVPNL's website. For Category A projects, the full EIA must be made available to the public and ADB's Board of Directors at least 120 days before board considers the loan as per SPS 2009 and in accordance with the ADB Public Communications Policy 2011 in English and local language.

Grievance Redress Mechanism (GRM)

43. RRVPNL does not have any specific Environment or Social Safeguards Policy currently. ADB procedures require RRVPNL to establish a Grievance Redressal Mechanism[12] (GRM) having suitable grievance redress procedure for the project affected persons. The GRM would address affected persons' concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to the affected persons at no costs. This GRM would consist of a Grievance Redress Committee (GRC) headed by the Project Head. The committee would consist of the following constitution as listed in Table 9:

Table 9: Constitution of Grievance Redress Committee

1	Project Head / CE (ADB Projects), RRVPNL
2	Sub District Magistrate or nominee of SDM
3	Land acquisition officer / Secretary
4	Head of Finance wing at the project level
5	Representative of local Panchayat/ NGO
6	Representative of contractor
7	Executive Engineer-Environment and Social Cell, RRVPNL

44. This Grievance Redress Mechanism (GRM) would provide an effective approach for resolution of complaints and issues of the affected person/community. Project Management Unit (PMU) shall formulate procedures for implementing the GRM. The PIU shall undertake GRM's initiatives that include procedures of taking/recording complaints, handling of on-the-

[11] A public hearing is a public investigation or inquiry which is held in a public forum and in which those who are affected by the matter(s) being heard or investigated.

[12] ADB requires that the borrower/client establish and maintain a grievance redress mechanism to receive and facilitate resolution of affected peoples' concerns and grievances about the borrower's/client's social and environmental performance at project level. The grievance redress mechanism should be scaled to the risks and impacts of the project. It should address affected people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people.

spot resolution of minor problems, taking care of complainants and provisions of responses to distressed stakeholders etc. paying particular attention to the impacts on vulnerable groups.

45. Grievances of APs will first be brought to the attention of the Project head of the Project Implementing Unit. Grievances not redressed by the PIU will be brought to the Grievance Redress Committee (GRC) set up to monitor project Implementation for each project area. The GRC will determine the merit of each grievance, and resolve grievances within three months of receiving the complaint, further grievances will be referred by APs to the appropriate courts of law. The PIU will keep records of all grievances received including: contact details of complainant, date that the complaint was received, nature of grievance, agreed corrective actions and the date these were effected, and final outcome. The flow chart showing Grievance Redress Mechanism is presented in Figure 1.

F. Institutional Arrangement and Responsibilities

46. The RRVPNL will be the Executing Agency (EA) along with the Energy Department, Government of Rajasthan for the project. The RRVPNL will constitute a Project Management Unit (PMU) for implementing the ADB loan at the corporate level and the PMU will be supported for implementation activities through the RRVPNL field offices. The proposed structure is shown in Figure 2. The PMU shall be headed by the Chief Engineer (T&C) and the Superintending Engineer (Planning) shall be responsible for coordinating all external functions with ADB. GOI, DEA, GOR as well as the internal functions such as Environment and Social/R&R reporting, Legal, Finance and Accounts, Field Project offices, Procurement and Contracts etc. and other functions from within RRVPNL. One Environment and Social Cell (ESC) shall be designated and headed by an Executive Engineer who shall be designated for monitoring ADB funded projects in areas such as Environment, R&R and Social safeguards. To assist ESC in these specialist functions, RRVPNL may hire appropriate consultants for monitoring purposes.

47. Under PMU, the relevant field offices of RRVPNL will assume primary responsibility for the environmental assessment as well as implementation of EMPs through contractors or third party consultants in consultation with ESC. The Project Head will be assisted by the PMU's Environmental and Social cell (ESC) for environmental monitoring and designing of appropriate mitigation measures. Keeping in view the minimal capacity of RRVPNL, it is proposed that this ESC must coordinate with each project divisions to address environmental and social issues[13].

48. The duties of the ESC will include at a minimum: (i) oversight of field office and construction contractors for monitoring and implementing mitigation measures; (ii) liaising with the field office and contractor and seeking their help to solve the environment-related issues of project implementation; and (iii) preparation of environmental management reports every 6 months (as required by ADB).

49. For each project EMPs, RRVPNL will do the overall coordination, preparation, planning, implementation, and financing of all activities. Additional third-party services may be employed by the RRVPNL as necessary.

50. The field office of RRVPNL will have overall responsibility to manage the site activities. The RRVPNL will ensure that contractor engaged for each project is involved in

[13] ADB advises that all EAs develop in-house capability for environmental, health, and safety (EHS) program consistent with international best practices. The EHS program should include accounting for environmental benefits resulting from investment projects within three months of loan approval. The monitoring agency shall report on semi-annual basis directly to ADB and determine whether sound environmental management practices have been achieved, and suggest suitable recommendations and remedial measures for midterm correction and improvement.

EMP monitoring and implementation. Further details on agencies responsible for EMP activities are in Table 10**.**

Table 10: Institutional Roles and Responsibilities for EMP Implementation Activities

Activity	Responsible Agency
Project Initiation Stage	
Assign field offices for each project	RRVPNL
Clearances/approvals from relevant GOI/GoR agencies- forest, roads, rivers, railways, telecom etc.	RRVPNL
Disclosure of project EMP details on RRVPNL website	PMU-ESC/ RRVPNL
Conducting discussions/meetings/workshops with APs and other stakeholders	PMU-ESC/RRVPNL
Updating of EMP mitigation measures based on discussions	PMU – ESC
EMP Implementation Stage	
Meetings at community/household level with Aps	Field Office/Contractor
Implementation of proposed EMP mitigation measures	Field Office/Contractor
Consultations with APs during EMP mitigation measures implementation	Field Office/Contractor
Grievances Redressal	PMU/RRVPNL/Sub-Divisional Administration, ESC
Internal monitoring	PMU/RRVPNL, ESC
External monitoring*	External Experts

ADB-Asian Development Bank; AP-Affected Persons; EA-Executing Agency; EMP-Environmental Management Plan; ESC – Environment and Social Cell: PMU- Project Management Unit

*Note –External monitoring only required when projects are noticed to have significant adverse environmental impacts.

Staffing Requirements and Budget

51. Costs required for operating the Environmental Assessment and Review Framework should cover the following - i). conducting IEE studies, preparing and submitting reports and public consultation and disclosure, which involves collection and analysis of data of proposed project, assessment and mitigation of impacts, preparation of the EMP, budget, public consultation, and preparation of the IEE report and summary; and ii). Implementation of EMP by Engineering, Procurement and Construction (EPC) contractor, the cost of which is included in the construction contracts. RRVPNL will make necessary budgetary provision and staffing requirement for preparation of IEE and its due monitoring for the future tranches and the EPC contractor will be responsible for bearing all the cost for implementing the EMP.

G. Monitoring and Reporting

52. RRVPNL will be responsible for implementing internal monitoring systems for EMP implementation, and will forward semi-annual progress reports to the Government and ADB. The reports will cover EMP implementation with attention to compliance and any needed corrective actions. On-going consultation measures will be incorporated in the EMP.

53. The field office will be responsible for internal monitoring of the EMP implementation, and will forward quarterly progress reports to the PMU with details of activities and progress made during EMP implementation. The PMU will submit semi-annual monitoring reports to ADB. If project activities are noticed to have significant adverse environmental impacts, ADB requires RRVPNL to retain qualified and experienced experts[14] or qualified Non-Government Organisation (NGO) or Community Based Organization (CBO) to verify the report. If required, these external experts/NGO or CBO will report on a semi-annual basis directly to ADB to verify if sound environmental management practices were followed during implementation. In case the implementation of EMP measures is not satisfactory, the external experts/NGO or CBO will recommend actions to enhance environmental compliance.

[14] External expert who is not involved in day-to-day project implementation or supervision

Figure: 1: Flow chart showing Grievance Redress Mechanism

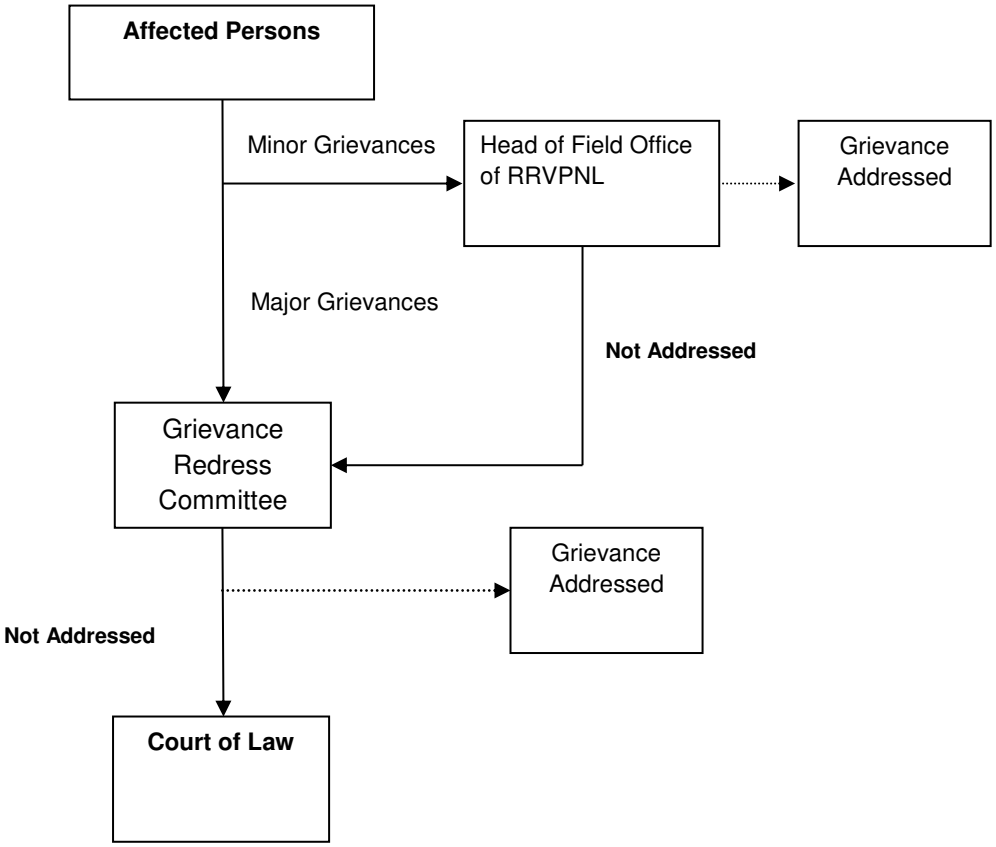
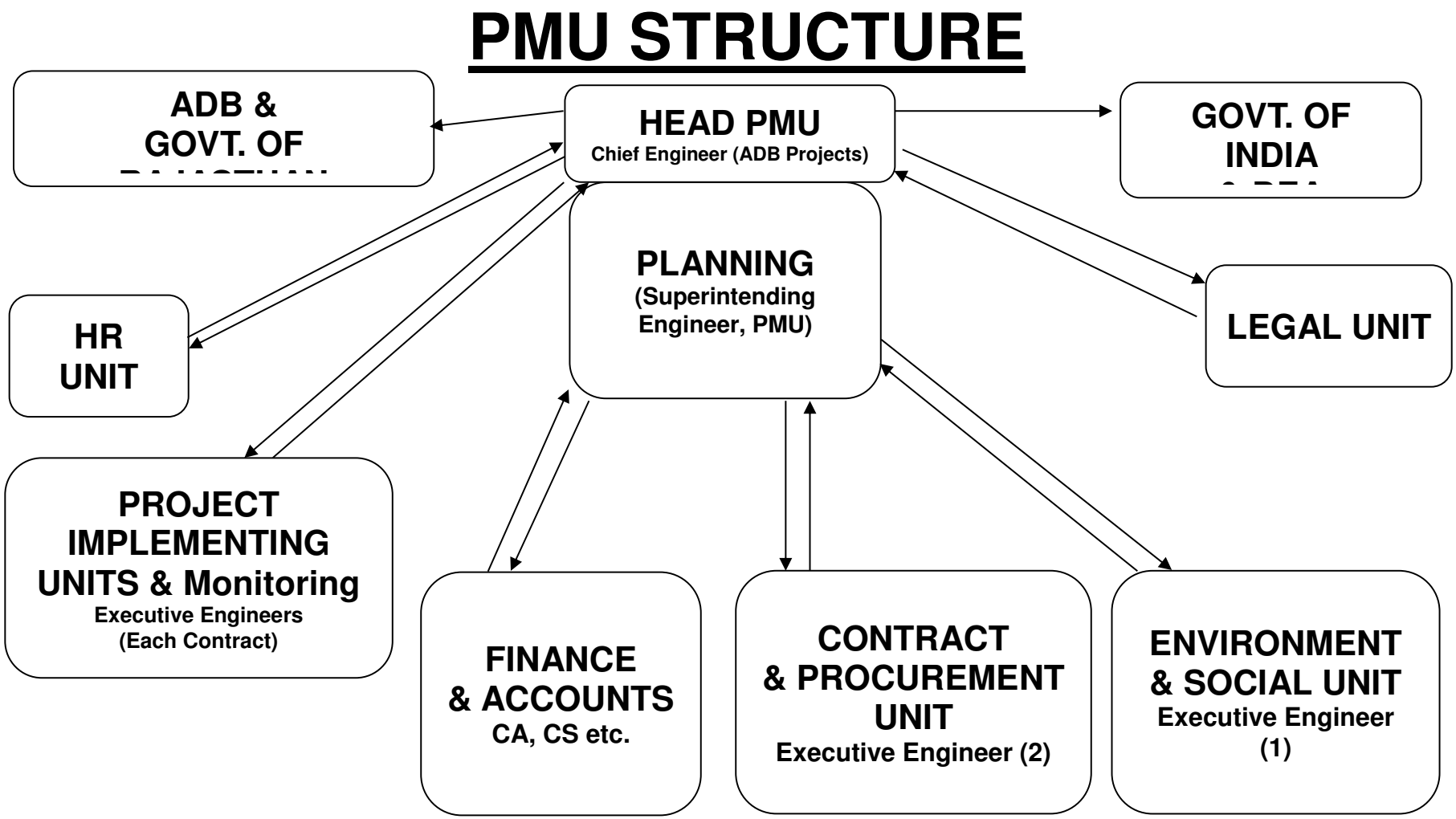


Figure 2: PMU structure of RRVPNL



Annexure 1: GOI and Local Regulatory Requirements and Procedures Followed by RRVPNL

Land Acquisition

1. Under the Indian Telegraph Act, transmission towers can be erected on private land. The ownership of the land is not acquired by the transmission company.

2. RRVPNL follows the provisions of the Land Acquisition Act of 1894 and the Rajasthan Land Acquisition Act, 1953. Section 6 of the Rajasthan Land Acquisition Act stipulates that the state government or any agency thereof (such as the Collector) can declare a certain piece of private land is required for public purpose. The RRVPNL may submit a request to the Collector for acquisition of land for grid substations. Section 4 of the same act requires the state government to publish a gazette notification regarding the acquisition of land. Under Section 5A of the same act, the interested or affected person is given the opportunity to record objection to the land acquisition within thirty days of the publication of the notice. The District Collector would then enquire into the matter and may give the award.

3. Under Section 5 of the Rajasthan Land Acquisition Act, the RRVPNL (or any public agency) must have the land to be acquired surveyed in the presence of the Collector or his nominee, and the owner of the land or the owner's authorized representative. RRVPNL would also be required to make payment for damages. Under Section 11 of the Rajasthan Land Acquisition Act, such payment is at the market value of the land on the date of notification made under Section 4(1). Section 16 of the Rajasthan Land Acquisition Act provides that the Collector may take possession of the land after he has made the award, and payment has been made.

4. In case of urgency, the state government can issue a Notification under Section 17 of the Rajasthan Land Acquisition Act, Subsection (1) and (4), to take over the land within 15 days of the notification under Section 9, irrespective of the compensation award. Compensation is decided subsequently by the Collector as described above; but tender payment of 80% of the compensation is to be made immediately.

Forest Clearance

5. The Ministry of Environment and Forests (MOEF) has gazetted a statutory notification called the Forest (Conservation) Act, 1980. According to this act permission of MoEF is required for use of any forest land for construction of power lines. In case the forest land is involved in a planned project, RRVPNL must show that the power line routing involves a minimum of forest land and that alternative routes have been considered. The application form for Forest Clearance includes: project description; detailed map; alternatives and reasons for rejection of alternatives; population benefited; employment granted; details of flora and fauna in the area; density and other specific details of vegetation; status as wildlife sanctuary, biosphere reserve, national park, nature reserve; rare or endangered species; habitat for migrating fauna; vulnerability to erosion; number of displaced families; scheduled caste/scheduled tribes involved in displacement; rehabilitation plan; and details of the compensatory afforestation scheme. The application includes a detailed route marked on a Survey of India map. The concerned Executive Engineer of the RRVPNL submits Forest Clearance applications to the concerned Divisional Forest Officer. The locations of reserved and protected forest are checked and marked on a map, and the Forest Clearance application in the required format is prepared jointly by RRVPNL and the Forest Department.

6. During the application review and approval process the review agencies comment on the application, and can return it to RRVPNL for required modifications. After review, the application is forwarded to the Conservator of Forests, Government of Rajasthan. The application requires a detailed opinion of the Chief Conservator of Forests/Head of Forest Department with regard to: self sufficiency of the district in fuel wood and timber; the effect of the proposal on rural fuel wood supply, the economy and livelihood of tribal and backward communities; and a certification that all other alternatives for the purpose have been

explored, and the demand for the required area is the minimum with respect to demand for forest land. Forest areas can be cleared and used only after payment for compensatory afforestation is made as detailed in the Forest clearance and final approval is obtained thereafter from the MoEF.

Procedure for submission of forest diversion case

7. The proposals relating to diversion of forest land should be submitted in prescribed performa (available on forest department website - http://www.rajforest.nic.in) directly to the Nodal officer (Additional Principal Chief Conservator of Forests (Protection), Rajasthan, Jaipur). The Nodal officer will send the proposals to the concerned DFO/ DCF's for completion of necessary formalities. These papers will be returned through Conservator of Forests.

8. However, for diversion of Forest land in Sanctuaries/National Parks, in view of the orders of the Hon'ble Supreme Court of India, the State Governments have been advised not to submit any proposal for diversion of forest land under FCA, 1980 without seeking prior permission of the Hon'ble Supreme Court. For seeking permission of Hon'ble Supreme Court, RRVPNL should submit the proposal to the Chief, Wild Life Warden (CWLW) Rajasthan in the prescribed Performa.

9. For small development and public utility projects involving diversion of forest land up to 5 Ha, the state government may authorize the Nodal Officer or any other officer to submit the proposals directly to the Regional Office of the MoEF. All proposals relating to diversion of forest land upto 40 hectares shall be sent directly to the concerned Regional office of the MOEF, Lucknow (as per the in case of Rajasthan) by the State Government. All other proposals shall be sent by the State Government to the Secretary, MoEF, Government of India.

Aravali Range Environmental Notification

10. The Ministry of Environment and Forests issued a Notification (May 7, 1992) restricting certain activities in specified areas of the Aravali Range (Alwar District of Rajasthan) which were deemed to be causing environmental degradation in the region. Among the activities restricted in the specified areas is electrification, "laying of new transmission lines." RRVPNL would apply to MoEF for clearance of any projects in the Aravali Range areas.

Crop Compensation

11. RRVPNL pays compensation to farmers whose crops are damaged during transmission line construction. Normally, construction work on the line is done during the non-crop season; however, when a crop is in the ground and any damage is caused, compensation is paid to the farmer as decided by the revenue authorities of the government, such as Tehsildar. Compensation applications are requested from the farmers in the subdivisions where work has been carried out. The applications are verified by the Sarpanch or Patwari. The area of land where the crop has been damaged is calculated and checked by the Governmental Subdivision Officer in charge personally and the yield of the crop is calculated on the yield declared by the Agriculture Department. The monetary value of the crop is calculated from rates declared by the Market Committee, or the agency of the district, and compensation is paid to the farmers.

Indian Electricity Act and the Indian Telegraph Act

12. On finalization of the transmission line route, a gazette notification is published in the state gazette concerning the right of way for the line, mentioning the revenue villages through which the line will pass. This notification is issued to meet the requirements of the Indian Electricity Act and the Indian Telegraph Act.

Power Telecommunication coordination Committee

13. RRVPNL applies to the Power Telecommunication Coordination Committee to clear

all transmission line projects. Interference through EMF effects could occur where the planned transmission lines would run in close proximity to telecommunications lines. The induced voltages on the communications circuits are limited to prescribed safe values. Telecommunications circuits are to be crossed at not less than a 60 degree angle, and guards are provided at the crossings of telecommunications and power lines of voltages of 33 kV and below. These approvals are issued only after the line survey work is completed.

Airport Authority

14. RRVPNL would apply to the Airport Authority for clearance if any power lines are planned within 15 km of an existing airport; however, transmission lines are not routed in the vicinity of airports.

Railway Authority

15. RRVPNL would apply to the Railway Authority for clearance should any power lines be planned that cross railways. In cases where planned lines would cross railways, detailed applications, including maps, showing tower locations on either side of the railway and vertical clearances are submitted. Railway lines are crossed at right angles to the extent possible. All stipulations of the railway authorities are followed by RRVPNL and the work is undertaken only after obtaining approval, and under supervision of the railway authority.

Annexure 2: Rapid Environmental Assessment (REA) Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
B. Potential Environmental Impacts Will the Project cause…			
▪ encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?			
▪ encroachment on precious ecosystem (e.g. sensitive or protected areas)?			
▪ alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?			
▪ damage to sensitive coastal/marine habitats by construction of submarine cables?			
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased local air pollution due to rock crushing, cutting and filling?			

Screening Questions	Yes	No	Remarks
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?			
▪ noise and vibration due to blasting and other civil works?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?			
▪ hazardous driving conditions where construction interferes with pre-existing roads?			
▪ creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?			
▪ dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?			
▪ environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?			
▪ facilitation of access to protected areas in case corridors traverse protected areas?			
▪ disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?			
▪ large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?			
▪ risks to community safety associated with maintenance of lines and related facilities?			
▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			

Screening Questions	Yes	No	Remarks
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	**Yes**	**No**	**Remarks**
▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)?			
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost?			
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?			
▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?			

Appendix I: Environments, Hazards and Climate Changes

Environment	Natural Hazards and Climate Change
Arid/Semi-arid and desert environments	Low erratic rainfall of up to 500 mm rainfall per annum with periodic droughts and high rainfall variability. Low vegetative cover. Resilient ecosystems & complex pastoral and systems, but medium certainty that 10–20% of drylands degraded; 10-30% projected decrease in water availability in next 40 years; projected increase in drought duration and severity under climate change. Increased mobilization of sand dunes and other soils as vegetation cover declines; likely overall decrease in agricultural productivity, with rain-fed agriculture yield reduced by 30% or more by 2020. Earthquakes and other geophysical hazards may also occur in these environments.
Humid and sub-humid plains, foothills and hill country	More than 500 mm precipitation/yr. Resilient ecosystems & complex human pastoral and cropping systems. 10-30% projected decrease in water availability in next 40 years; projected increase in droughts, heatwaves and floods; increased erosion of loess-mantled landscapes by wind and water; increased gully erosion; landslides likely on steeper slopes. Likely overall decrease in agricultural productivity & compromised food production from variability, with rain-fed agriculture yield reduced by 30% or more by 2020. Increased incidence of forest and agriculture-based insect infestations. Earthquakes and other geophysical hazards may also occur in these environments.
River valleys/ deltas and estuaries and other low-lying coastal areas	River basins, deltas and estuaries in low-lying areas are vulnerable to riverine floods, storm surges associated with tropical cyclones/typhoons and sea level rise; natural (and human-induced) subsidence resulting from sediment compaction and ground water extraction; liquefaction of soft sediments as result of earthquake ground shaking. Tsunami possible/likely on some coasts. Lowland agri-business and subsistence farming in these regions at significant risk.
Small islands	Small islands generally have land areas of less than 10,000km2 in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small island developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP.
Mountain ecosystems	Accelerated glacial melting, rockfalls/landslides and glacial lake outburst floods, leading to increased debris flows, river bank erosion and floods and more extensive outwash plains and, possibly, more frequent wind erosion in intermontane valleys. Enhanced snow melt and fluctuating stream flows may produce seasonal floods and droughts. Melting of permafrost in some environments. Faunal and floral species migration. Earthquakes, landslides and other geophysical hazards may also occur in these environments.
Volcanic environments	Recently active volcanoes (erupted in last 10,000 years – see www.volcano.si.edu). Often fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ashfall.

Annexure 3: Outline of An Environmental Impact Assessment Report

This outline is Annex 1 of Safeguard Requirements 1: Environment (Appendix 1 of ADB's Safeguard Policy Statement, June 2009). An environmental assessment report is required for all environment category A and B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.

A. Executive Summary

This section describes concisely the critical facts, significant findings, and recommended actions.

B. Policy, Legal, and Administrative Framework

This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

C. Description of the Project

This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project's layout and components, the project site, and the project's area of influence.

D. Description of the Environment (Baseline Data)

This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

E. Anticipated Environmental Impacts and Mitigation Measures

This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media [Appendix 2, para. 6]), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, transboundary, and cumulative impacts as appropriate.

F. Information Disclosure, Consultation, and Participation

This section:

(i) describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders;

(ii) summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and

(iii) describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

G. Grievance Redress Mechanism

This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

I. Environmental Management Plan

This section deals with the set of mitigation and management measures to be taken during

project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

(i) Mitigation:
   (a) identifies and summarizes anticipated significant adverse environmental impacts and risks;
   (b) describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and
   (c) provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.

(ii) Monitoring:
   (a) describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and
   (b) describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.

(iii) Implementation arrangements:
   (a) specifies the implementation schedule showing phasing and coordination with overall project implementation;
   (b) describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and
   (c) estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan.

(iv) Performance indicators: describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

J. Conclusion and Recommendation

This section provides the conclusions drawn from the assessment and provides recommendations.