Environment Planning Document

Environmental Assessment and Review Framework

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India: Rajasthan Renewable Energy Transmission Investment Program

Prepared by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPN), Government of Rajasthan.

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, RRVPN
GHG	–	Green House Gas
GOR	–	Government of Rajasthan
GoI	–	Government of India
GRM	–	Grievance Redress Mechanism
RSPCB	–	Rajasthan State Pollution Control Board
RRVPN	–	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

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ABBREVIATIONS

WEIGHTS AND MEASURES

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 accommodate both solar photovoltaic (PV) power plants and concentrated solar power (CSP) plants (in phase I). 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. The development of this 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 large solar park of nearly 250 MW in phase I that is unprecedented among ADB's developing member countries with associated technical and other challenges, (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 (RRVPN) is the state transmission utility (STU) of Rajasthan. RRVPN is responsible for the planning, development, operation and maintenance of the transmission facilities at 132 kV and above in Rajasthan. RRVPN has developed a detailed project report to evacuate nearly 4,000 MW of solar and wind energy from a high renewable energy potential zone identified in Western Rajasthan. RRVPN expects nearly 1,700 MW of solar power and 2,300 MW of wind power to be connected to its bulk power transmission system in this region. 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.

6. The main objective of RRVPN is to provide reliable electric transmission service as the State Transmission Utility (STU) whose infrastructure links to the national grid for transporting electricity to millions of electricity users across the country. RRVPN has following duties and responsibilities:

- Intra state transmission of electricity through Intra-State Transmission System
- Planning and co-ordination relating to intra-state transmission with all concerned agencies such as central transmission utility (CTU), state government generating companies, licensees, regional power committees etc.
- Ensuring development of an efficient, coordinated and economical system of intra-state transmission of electricity from generating stations to load centers.
- Non-discriminatory "Open Access" to its transmission system on payment of transmission charges.
- Complying with the directions of Regional Load Dispatch Center (RLDC) and State Load Dispatch Center (SLDC) as well as operating the SLDC until any other system is established by the state government.

7. 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 produce the following outcomes: (i) increased availability of clean energy to state grid at electrical grid substations for effective power evacuation in a financially sustainable manner, (ii) improved state finances and power sector financial viability from sales revenue earned from power exports, (iii) improved sector governance, (iv) improved capacity in Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPN) for better planning, implementation and management of power evacuation infrastructure, and energy efficiency through a better power management program, and (v) Improvement in standards of environmental and social safeguards in the sector. With ADB support, the proposed program will sustain the energy sector reform agenda, and is expected to help attract other long-term financiers to the state.

8. The potential for renewable energy sources envisaged in Rajasthan are:

Source	Total Potential
Wind	About 7,000 MW
Solar	>100,000 MW

9. The RRETIP will finance four major areas of transmission activities:

a. Power transmission lines:
- 840 km of 400 kV twin moose conductor double circuit line in Jaisalmer, Jodhpur, Bikaner, Barmer, Jalore and Sikar districts;
- 420 km of 400 kV quad moose conductor double circuit line in Jaisalmer, Jodhpur and Bikaner districts; and
- Charging of 132 kV lines in Jodhpur district.

b. New EHV grid substations (GSS):
- Construction of two new 400 kV grid substations in Bhadla village in Jodhpur district and Ramgarh in Jaisalmer district.

c. Augmentation in existing grid substations
- Augmentation of existing 400 kV at Bikaner, Jodhpur, Akal and Barmer Grid Substations.

d. Procurement Packages
- Transformer Package for grid substations;
- Shunt Reactors for grid substations; and
- 400 kV conductor for 400 kV lines.

10. This Environmental Assessment and Review Framework (EARF) is applicable to all investments funded by the MFF, and particularly to sub-projects included in subsequent tranches that are yet to be fully defined. The EARF outlines the policy, procedures, and institutional requirements for preparing subsequent subprojects. The Executing Agency (EA)

will be the Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPN) along with the Energy Department, Government of Rajasthan. RRVPN 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. 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 (including grant)	100.7	125.0	75.0	300.7	39.8
Clean Technology Fund[a]	50.0	100.0	50.0	200.0	26.4
Government of Rajasthan (including NCEF)	96.3	75.0	84.3	255.6	33.8
Total	**247.0**	**300.0**	**209.3**	**756.3**	**100.0**

[a] Under the Climate Investment Fund
Source: Asian Development Bank estimates.

11. The ADB share for 1st tranche financing will be USD 150.7 million and the GOR share will be USD 96.3 million. **Table 2** provides performance targets for the investment program.

Table 2: 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 • 1440 km of transmission lines enabling 4,240 MW of additional capacity to be transmitted
2. Construction of grid substations	• Evacuation and supply of reliable power • Augmentation and construction of 6 new substation adding 5,465 MVA (2,033 MW) of additional transmission capacity will result from the project
3. Smart grid applications	• innovation, smart grid applications and automation system for 220 kV and 132 kV EHV schemes

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

12. As on August 2011, 1,674.795 MW of wind Farm Projects are already connected to the Grid. It is anticipated that the wind and solar Generation in Jaisalmer area would further increase by approximately 2,500-2,600 MW by 2013-14. The following additional transmission system would be required for evacuation of power generated from wind/solar projects located in Jaisalmer and Jodhpur area. **Table 3** provides a list of both ADB funded and RRVPN funded sub-projects components for all Tranches.

Table 3: Investment Components Funded under Project

S No	**Items**	**Total cost in Rs in Million (excluding IDC)**
	Tranche 1 Components	
	ADB Funded Components	
1	400 kV D/C Ramgarh (Jaisalmer district) to Akal (Jaisalmer district) line (Twin Moose conductor) - 100 km transmission line.	508.7
2	400 kV D/C Ramgarh – Bhadla transmission line (Twin Moose conductor) – 180 km transmission line.	915.7
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.	813.9
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.	884.7
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.	949.4
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.	416.7
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)	220.2

S No	Items	Total cost in Rs in Million (excluding IDC)
	line at Bikaner end of the lines.	
8	Transformer Package for Ramgarh, Bhadla and Akal.	480.1
9	Shunt Reactors Package for Ramgarh, Bhadla, Bikaner and Akal.	404.5
10	400 kV conductor for 400 kV lines mentioned at above Sr. No. 1,2 and 3.	1,659.2
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.	30.3
	RRVPN Funded Components	
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.	642.9
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.	748.1
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)	530.6
(ii)	LILO of 220 kV Barsingsar LTPS-Phalodi line at Bap.	77.0
(iii)	220 kV D/C Bap-Bhadla line.	277.1
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)	519.8
(ii)	220 kV D/C Bhadla- Kanasar line.	77.0
(iii)	LILO of 132kV PS1-PS2 line at proposed 220 kV GSS at Kanasar.	22.4
(iv)	LILO of 132kV PS2-PS3 line at proposed 220 kV GSS at Kanasar.	18.6
5	Up-gradation of PS No. 2 to 132kV Grid Substation with 132/33 kV, 2x20/25 MVA Transformers with associated 132kV line.	160.6
6	Up-gradation of PS No. 3 to 132kV Grid Substation with 132/33 kV, 2x20/25 MVA Transformers.	160.6
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.	57.9
	Tranche 2 Components (Expected)	
	ADB Funded Components	
1	400 kV D/C Akal-Jodhpur (New) line (Quad Moose).	2538.2
2	400 kV D/C Bhadla-Bikaner line (Quad Moose).	1903.6
3	400 kV D/C Bikaner-Sikar (PGCIL) line (Twin Moose).	1068.3
4	LILO of one circuit of 400 kV D/C Raj West-Jodhpur line at 400 kV GSS Jodhpur (New) (Twin Moose).	254.3
5	400 kV conductor for 400 kV lines mentioned at above Sr. No. 1 & 2.	3167.6
6	400 kV conductor for 400 kV lines mentioned at above Sr. No. 3 & 4.	980.5
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.	30.3
	RRVPN Funded Components	
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)	367.8
	(b) 2 Nos. 220 kV bays at Ramgarh (400 kV GSS).	17.4
(ii)	220 kV D/C Chatrail-Ramgarh (U/C 400 kV GSS) line	216.7
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.).	398.1
(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).	36.1
(iii)	LILO of existing 132 kV S/C Chandan-Pokaran line at proposed 220 kV GSS Pokaran.	23.9
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.).	381.7
	(b) 2 Nos. 220 kV bays at 220 kV GSS Gajner.	17.4
(ii)	220 kV D/C Gajner (U/C 220 kV GSS)-Kolayat line.	54.2
(iii)	LILO of existing 132 kV S/C Kolayat-Bajju line at proposed 220 kV GSS Kolayat.	23.9
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).	364.3
(ii)	LILO of one circuit of U/C 220 kV D/C Dechu-Phalodi line at proposed 220 kV GSS Ramdev Nagar.	18.1
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.	960.0
	Tranche 3 Components (Expected)	
	ADB Funded Components	
1A	400/220 kV, 2 X 500 MVA GSS at Jaisalmer-2 along with 1x125 MVAR , 400 kV Bus Type Reactor.	898.9
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).	128.8
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).	268.4
3	Transformer Package for Jaisalmer-2.	226.5
4	Shunt Reactors Package for Jaisalmer-2.	52.2
5	400 kV D/C Jaisalmer-2 -Barmer line.	661.3
6	400 kV S/C Akal(1)- Jaisalmer-2 line.	254.4
7	400 kV D/C Barmer-Bhinmal (PGCIL) line (Twin Moose).	712.2
8	400 kV conductor for 400 kV lines mentioned at above Sr. No. 5, 6 and 7.	1206.7
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.	30.3
	RRVPN Funded Components	
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.	384.2

S No	Items	Total cost in Rs in Million (excluding IDC)
	(b) 2 Nos. 220 kV bays at 220 kV GSS Bap.	17.4
(ii)	220 kV D/C Badisid-Bap (U/C 220 kV GSS) line.	54.2
(iii)	220 kV D/C Badisid - Aau (Proposed 220 kV GSS) line.	180.6
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.	394.6
	(b) 2 Nos. 220 kV bays at 220 kV GSS Baithwasia.	17.4
(ii)	220 kV D/C Aau - Baithwasia (U/C 220 kV GSS) line.	144.4
(iii)	LILO of existing 132 kV S/C Aau (132 kV GSS)-Phalodi line at proposed 220 kV GSS Aau.	12.0
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).	381.7
	(b) 2 Nos. 220 kV bays at 400/220 kV GSS Bhadla.	17.4
(ii)	220 kV D/C PS_1 / Bajju - Bhadla (U/C 400 kV GSS) line.	72.2
(iii)	LILO of existing 132 kV S/C PS1-Bajju line at proposed 220 kV GSS PS_1 / Bajju.	23.9
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.	960.0
(iii)	LILO of existing 132 kV S/C PS1-Bajju line at proposed 220 kV GSS PS_1 / Bajju.	23.9

GSS= Grid Substation

B. Environmental Regulatory and Policy Framework for Sub-project Selection

13. GoI, GoR and ADB's environment policies and procedures apply to all sub-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 areas[1]. For each major investment component, an Initial Environmental Examination (IEE) will be prepared by RRVPN 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 sub-project.

National/Local Government Environment Classification

14. 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 subproject 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 subproject 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.

15. 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 subproject 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.

16. 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

[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

(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
(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

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.

17. **Annexure 1** gives the GOI and Local Regulatory Requirements and Procedures followed by RRVPN.

Asian Development Bank's Environment Classification

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

19. **Table 4** provides a brief write up on the equivalence of the current GoI Environmental Rules and Regulations and ADB Safeguard Policy Statement 2009.

Table 4: Equivalence of the GoI Environmental Rules and Regulations and ADB Safeguards Policy Statement 2009

No	Policy Statement	India	ADB	Comments
1	Commensurate Environmental 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.
2	Asses potential impacts and risks to physical, biological, socio-economic and physical cultural resources of the project affected area	✓	✓	The Environment Impact Assessment Notification, 1994 and amended up to 2009.
3	Examine alternatives for project's location, design, technology and potential environmental impacts	✓	✓	National Environmental Policy, 2006.
4	Preparation of Environmental Management Plan	✓	✓	National Environmental Policy, 2006.
5	Carrying out Public Consultations and concerns	✓	✓	The Environment Impact Assessment Notification, 2006 and amended up to 2009.
6	Establish a grievance redress mechanism to receive and facilitate resolution to the affected people's concerns and grievances regarding the project's environmental performance	✓	✓	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	Disclose a draft Environmental Impact Assessment report: then disclose the final Environmental Assessment.	✓	✓	Public consultation and disclosure 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	Implementation of monitoring effectiveness	✓	✓	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	✓	✓	ADB requires Environmental Monitoring Plan for monitoring and mitigation of environmental impacts and risks. 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) SEAC releases specific guidelines and recommendations for the mitigation of environmental impacts relevant to each sub project
10	Provision of workers safety and health	✓	✓	National Policy on Safety, Health and Environment at Work Place Appropriate extent of workers safety and the health discussed under the EMP The Public Liability Insurance Act, 1991
11	Conserve physical cultural resources and avoid destroying or damaging them	✓	✓	The Ancient Monument and Archaeological Sites and remains (Amendment and Validation) Act, 2010

C. Environmental Criteria for Additional Sub-project Selection

20. Specific environmental criteria for sub-project selection are:

i. Sub-projects will not be located within national parks, wildlife sanctuaries and nature reserves, or wetlands, unless unavoidable for technical reasons.
ii. Monuments of cultural or historical importance will be avoided.
iii. Construction activities do not adversely affect the population living in the vicinity of the proposed lines and does not create any threat to the survival of any community

[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,

with special reference to tribal community or any public utility services like playgrounds, schools, other establishments etc.

iv. Resettlement of households by the program, and compensation for loss of livelihood, shall be carried out in an equitable manner and with due consultation with the local government units concerned.

v. An Environmental Management Plan (EMP) with adequate budget will be developed for each sub-project. Proper Environmental Monitoring Plan must be in place to monitor EMP during implementation and operation stages.

vi. Environment Category A sub-projects must comply with ADB's 120-day disclosure policy.

vii. Potential environmental impacts will be minimized by routing and siting to avoid sensitive areas. Re-alignment or selection of alternative sites to minimize impacts may be required.

viii. Clearing of any existing forest resources will be avoided if possible, and where unavoidable, will be minimized and compensated as per GoI regulatory criteria.

ix. New equipment/facilities specifications shall follow international standards and best practices to avoid use of chemicals causing Green House Gas (GHG) emissions. All equipment procured shall be free from Poly Chlorinated Biphenyls (PCBs). If SF_6 (Sulphur Hexafluoride, a highly non-toxic greenhouse gas (GHG)) based equipment is installed, proper maintenance management program will have to be implemented to avoid leakage beyond international norms for GHG to the atmosphere.

D. Environmental Assessment and Review Procedures of Additional Sub-projects

1. Application of Selection Criteria

21. Proposed sub-projects will be screened for compliance with selection criteria listed above prior to additional analysis. 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]. Design changes may be suggested or required by ADB and GoI for proposed projects that initially do not meet the selection criteria.

2. Preparation of IEEs and EIAs

22. 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/or EIA describe the studies needed to be conducted to identify the potential environmental impacts.

23. IEEs and EIAs will need to be prepared and disclosed in accordance with ADB's Public Communication Policy 2005. 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 sub-project approval by ADB[5].

3. Responsibilities /Authorities of various agencies

a. Responsibility of RRVPN

24. The proposed Project Management Unit (PMU) and field based Project Implementation Unit (PIU) levels for project implementation is shown in **Figure 1.** RRVPN

[3]ADB's Safeguards Policy Statement-2009 issued on 20 January 2010 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 sub-projects, the EIA shall be made available to the ADB Board of Directors and publicly disclosed 120 days before Board Consideration.

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 RRVPN 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.

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

26. RRVPN 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

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

4. Preparation of detailed design

28. Detailed design work for each additional sub-project will follow the recommendations of the IEE/EIA. RRVPN will review detailed designs before contracts are finalized and modifications will be incorporated if considered 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 components under the 3 tranches of proposed MFF is presented in **Table 5.**

Table 5: Type of Sub-projects and 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

5. Preparation of Construction Contracts

29. Construction contracts will incorporate the Environmental Management Plan (EMP) for environmental safeguards compliance. Specific individual contracts will include appropriate contract language, and will be vetted by RRVPN to ensure that EMP requirements are covered within the contract.

6. Monitoring During the Construction Period

30. Monitoring during construction will be the responsibility of RRVPN. 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 RRVPN.

7. Monitoring of Sub-project Operations

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

E. Environmental Management Plan

32. An environmental management plan (EMP) will be prepared that will apply to all sub-projects[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 sub-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.

33. 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 6** presents the summary monitoring plan for sub-projects to be funded, whereas **Table 7** provides the Minimum Provisions for Environmental Monitoring.

Table 6: 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,RRVPN	Prior to issue of bidding documents
Monitor contractor's detailed alignment survey to ensure relevant environmental mitigation measures in EMP have been included.	RRVPN through PMU	Prior to RRVPN 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, RRVPN	Prior to RRVPN approval of contractor's detailed designs.
Approvals from GoR/GoI agencies such as forest department, roads, railways etc. as required before finalization.	RRVPN	Prior to RRVPN approval of contractor's detailed designs.
Construction Phase		
Regular monitoring and reporting of contractor's compliance with contractual environmental mitigation measures.	PIU, PMU	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.	PIU	As per RRVPN inspection schedules
Handling of waste oil from transformers to be handled by certified agencies.	PIU	As per GoI/GoR statutory requirements
Monitoring SF_6 leakages in GIS equipment.		

[6] The EMP is presented as a stand-alone document.

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

Table 7: Minimum Provisions for Environmental Monitoring[8]

Project Stage	Mitigation Measures	Parameters to be Monitored	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.	RRVPN /PIU 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	RRVPN /PIU to include in bidding documents. 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.	Contractors to implement, PIU to provide oversight via regular field inspections; ADB to review during project review missions	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	Spot checks for solid waste activities	PIUs have responsibility for solid waste management	
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 RRVPN for SF_6, Oil and Noise	RRVPN through PIU, 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, PIU = Project Implementation Unit, SPM = suspended particulate matter, TSS = total suspended solids, SF_6 – Sulphur Hexafluoride gas, a highly non toxic GHG gas

[8] Monitoring of 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.

F. Institutional Arrangements and Responsibilities

34. The RRVPN will be the Executing Agency (EA) along with the Energy Department, Government of Rajasthan for the project. The RRVPN will constitute a Project Management Unit (PMU) for implementing the ADB loan at the corporate level and Project Implementing Units (PIUs) at the sub-project level. The proposed structure is shown in **Figure 1**. 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 RRVPN. 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, RRVPN may hire appropriate consultants for monitoring purposes.

35. Under PMU, there will be Project Implementation Units (PIUs) which 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 RRVPN, it is proposed that this ESC must coordinate with each project divisions (PIU along with other engineering units) to address environmental and social issues[11].

36. The duties of the ESC will include at a minimum: (i) oversight of PIU and construction contractors for monitoring and implementing mitigation measures; (ii) liaising with the PIU 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).

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

38. The PIU will have overall responsibility to manage the site activities. The RRVPN will ensure that contractor engaged for each subproject is involved in EMP monitoring and implementation. Further details on agencies responsible for EMP activities are in **Table 8.**

Table 8: Institutional Roles and Responsibilities for EMP Implementation Activities

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

[11] 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.

Activity	Responsible Agency
External monitoring*	External Experts

ADB-Asian Development Bank; AP-Affected Persons; EA-Executing Agency; EMP-Environmental Management Plan; ESC – Environment and Social Cell: PIU- Project Implementation Unit; PMU- Project Management Unit
*Note –External monitoring only required when projects are noticed to have significant adverse environmental impacts.

G. Information Disclosure, Consultation and Participation, and Grievance Redress Mechanism

8. Information Disclosure

39. RRVPN 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 RRVPN'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 2005 in English and local language.

9. Consultation and Participation

40. 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 RRVPN may hold public hearings[12] to determine or investigate any matter that it considers necessary in the public interest.

41. During public consultation sessions of the IEE study, the discussions with groups and individuals 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.

42. A community awareness program must be conducted one month prior to construction by the RRVPN 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.

10. Grievance Redress Mechanism (GRM)

43. RRVPN does not have any specific Environment or Social Safeguards Policy currently. ADB procedures require RRVPN to establish a Grievance Redressal Mechanism (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 consists of a Grievance Redress Committee (GRC) headed by the Project Head. The committee consists of the following constitution as listed in **Table 9**:

Table 9: Constitution of Grievance Redress Committee

1	Project Head / CE (ADB Projects)
2	Sub District Magistrate or nominee of SDM
3	Land acquisition officer / Secretary RRVPN
4	Head of Finance wing at the project level
5	Representative of local Panchayat/ NGO

[12]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.

6	Representative of contractor
7	Executive Engineer -Environment and Social Cell

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-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 2**.

H. Monitoring and Evaluation

46. RRVPN 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.

47. The PIU 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 RRVPN to retain qualified and experienced experts[13] 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.

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

Figure 1: PMU structure of RRVPN

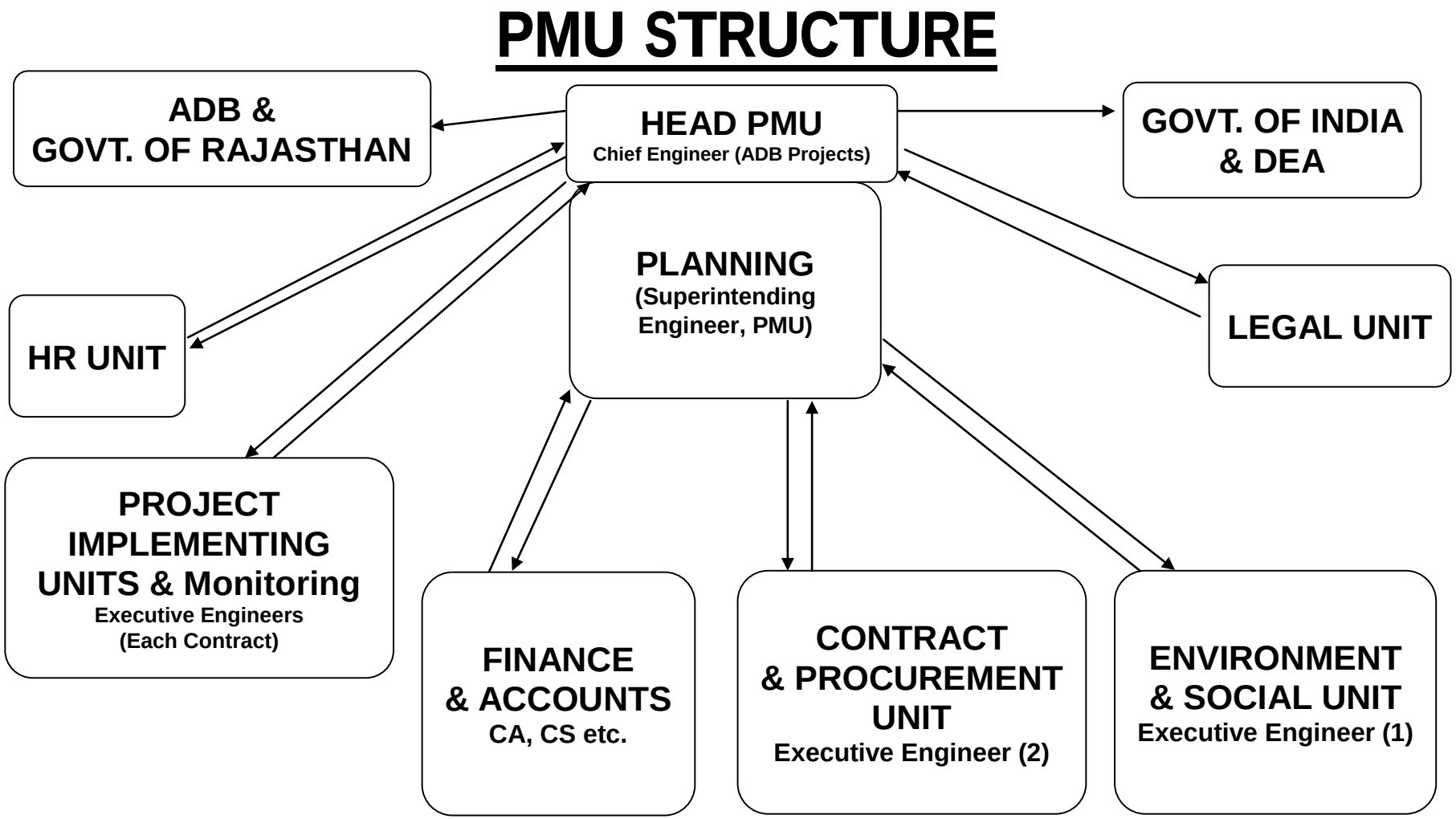
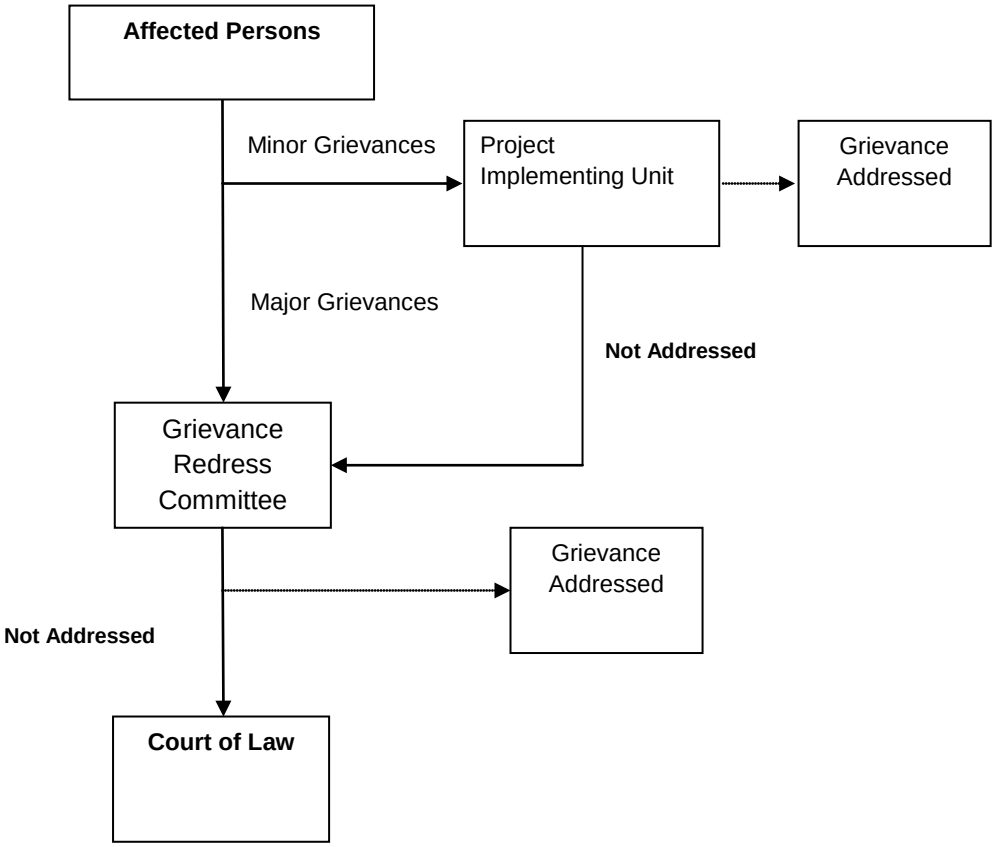


Figure: 2: Flow chart showing Grievance Redress Mechanism



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

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. RRVPN 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 RRVPN 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 RRVPN (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. RRVPN 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, RRVPN 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 RRVPN 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 RRVPN and the Forest Department.

6. During the application review and approval process the review agencies comment on the application, and can return it to RRVPN 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, RRVPN 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." RRVPN would apply to MoEF for clearance of any projects in the Aravali Range areas.

Crop Compensation

11. RRVPN 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. RRVPN 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. RRVPN 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. RRVPN 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 RRVPN and the work is undertaken only after obtaining approval, and under supervision of the railway authority.