

EXECUTIVE SUMMARY

A.1 BACKGROUND

APRDC has planned to improve the State road network by providing better quality and safer roads to the users in sustainable manner with loan assistance from World Bank. Improved quality of roads, better institutional operation and management system of APRDC and safe roads are important features of the project component. In this connection RDC has selected 38 corridors (cumulative length of 2002 km) of high-density (traffic) roads through Strategic Option Study (SOS) to be developed in phased manner.

A.2 OBJECTIVES OF THE ASSIGNMENT

The main objective would be to alleviate the current unsafe and congested conditions of the road network connecting the villages and towns by providing better quality and safe roads to the users in a sustainable and environment friendly manner. Government of India, GoI through Ministry of Environment and Forest (MoEF) enforces **Environment (Protection) Rules, 1986** for environmental protection because of intervention of new projects or activities, or on expansion and modernization of existing projects or activity based on their environmental impacts.

A.3 SCOPE OF ENVIRONMENTAL ASSESSMENT (EA)

The environmental assessment scope includes screening and scoping, environmental assessment and environmental management plans for the individual project roads as required. The EA process also envisages to develop a comprehensive environmental management frame work for the entire project which will adopted as part of the corporate environmental policy for AP Road Development Corporation.

A.4 DESCRIPTION OF PROJECT ROAD

Pedna – Nuzvid – Vissannapet Road, the project road is a section of State Highway No. 46, located in Andhra Region of Andhra Pradesh. The Project road starts at Pedana bypass(assumed km 7/0) at Buntumilli road jn. and traverses through km 9/4 of SH 46 at Pedna in Krishna district and runs north west direction connecting Gudlavalleru, Gudivada, Hanumanjunction, Nuzvid and terminates at km 96/0 Before Vissannapet . Cumulative Length of PR is 83.6 km. The project road provides connectivity between Machilipatnam Port with NH-214A, NH-214, NH-5 & NH-221 and is widely used by interstate traffic.

A.5 KEY ENVIRONMENTAL LAWS AND REGULATIONS

Table 1 presents the environmental regulations and legislations relevant to AP state road project.

Table 1: Environmental Regulations and Legislations

SR. No	Act / Rules	Purpose	Applicable Yes/ No	Reason for Applicability	Authority
1	Environment Protection Act-1986	To protect and improve overall environment	Yes	As all environmental notifications, rules and schedules are issued under this act.	MoEF, GoI; DoE, State Gov. CPCB; SPCB
2	Environmental Impact Assessment Notification 4 th April, 2011	To provide environmental clearance to new development activities following environmental impact assessment	NO	This notification is NOT applicable to Project road, as this is an up-gradation existing state highway	MoEF, EIAA
3	Notification for use of fly ash	Reuse large quantity of fly ash discharged from thermal power plant to minimize land use for disposal	NO	No thermal plant within 100km reaches.	

SR. No	Act / Rules	Purpose	Applicable Yes/ No	Reason for Applicability	Authority
4	Coastal Regulation Zone(CRZ) Notification 1991 (2002)	Protection of fragile coastal belt	NO	Road is not located along coastal belt	
5	National Environment Appellate Authority Act (NEAA) 1997	Address Grievances regarding the process of environmental clearance.	Yes	Grievances if any will be dealt with, within this act.	NEAA
6	The Land Acquisition Act 1894 & 1989	Set out rule for acquisition. of land by government	Yes	This act will be applicable to as there will be acquisition of land for widening, geometric improvements and realignments.	Revenue Department State Government.
7	MoEF Circular on Marginal Land Acquisition and Bypasses 1999	Defining "marginal land" acquisition relating to the 1997 Notification	NO	Not applicable as per Environmental Impact Assessment Notification 14th Sep-2006	MoEF
8	The Forest (Conservation) Act 1927 The Forest (Conservation) Act. 1980 forest (conversion) Rules 1981	To check deforestation by restricting conversion of forested areas into non- forested areas	NO	NO forest area.	Forest Department, GoAP
9	MoEF circular (1998) on linear Plantation on roadside, canals and railway lines modifying the applicability of provisions of forest (Conversation) Act, to linear Plantation	Protection / planting roadside strip as avenue/strip plantations as these are declared protected forest areas.	NO	Roadside tree plantation in Andhra Pradesh does not come under the forest act.	MoEF
10	Wild Life Protection Act 1972	To protect wildlife through certain of National Parks and Sanctuaries	NO	This act is not applicable to as there are NO points of wildlife crossing along project corridor.	Chief Conservator Wildlife, Wildlife Wing, Forest Department, GoAP
11	Air (Prevention and Control of Pollution) Act, 1981	To control air pollution by & Transport controlling emission of air Department. Pollutants as per the prescribed standards.	Yes	This act will be applicable during construction; for obtaining NOC for establishment of hot mix plant, workers' camp, construction camp, etc.	SPCB
12	Water Prevention and Control of Pollution) Act1974	To control water pollution by controlling discharge of pollutants as per the prescribed standards	Yes	This act will be applicable during construction for (establishments of hot mix plant, construction camp, workers' camp, etc.	SPCB
13	Noise Pollution (Regulation and Control Act) 1990	The standards for noise for day and night have been promulgated by the MoEF for various land uses.	Yes	This act will be applicable as vehicular noise on project routes required to assess for future years and necessary protection measure need to be considered in design.	SPCB
14	Ancient Monuments and Archaeological Sites and Remains Act1958	Conservation of cultural and historical remains found in India	NO	This act not applicable as the project route is not close to any Ancient Monument, declared protected under the act.	Archaeological Dept Gol, Indian Heritage Society and Indian National Trust for Art and Culture Heritage (INTACH).

SR. No	Act / Rules	Purpose	Applicable Yes/ No	Reason for Applicability	Authority
15	Public Liability and Insurance Act 1991	Protection form hazardous materials and accidents.	Yes	Contractor need to stock hazardous material like diesel, Bitumen, Emulsions etc.	SPCB
16	Explosive Act 1984	Safe transportation, storage and use of explosive material	Yes	For transporting and storing diesel, bitumen etc.	Chief Controller of Explosives
17	Minor Mineral and concession Rules	For opening new quarry.	Yes	Regulate use of minor minerals like stone, soil, river sand etc.	District Collector
18	Central Motor Vehicle Act 1988 and Central Motor Vehicle Rules 1989	To check vehicular air and noise pollution.	Yes	This rule will be applicable to road users and construction Machinery.	Motor Vehicle Department
19	National Forest Policy 1952 National Forest Policy (Revised) 1988	To maintain ecological stability through preservation and restoration of biological diversity.	NO	This policy will not be applicable as NO eco sensitive feature exists along the project corridor.	Forest Department, Gol and GoAP
20	The Mining Act	The mining act has been notified for safe and sound mining activity.	Yes	The construction of project road will require aggregates. These will be procured through mining from riverbeds and quarries	Department of mining, GoAP

On the basis of data and information collected during field survey and discussion with local expert and visualise potential associated impact, consultant has categorised this project as **category-B**, which requires a lesser level of environmental investigation.

A.6 BASE LINE ENVIRONMENT

Data was collected from secondary sources for the macro-environmental setting like climate, physiography (Geology and slope), biological and socio-economic environment within Project Influence Area, PIU/ Project District, PD . First hand information have been collected to record the micro-environmental features within Corridor of Impact, CoI. Collection of first hand (Primary) information includes preparation of base maps, extrapolating environmental features on proposed road design, tree enumeration, location and measurement of socio-cultural features abutting project road.

A.7 STAKEHOLDER CONSULTATION

Consultative procedure, since the inception of the project, has been continued during pre-feasibility, feasibility, Environmental Assessment and Management Plan preparation stage. Considering the fact that involving local communities in the project planning is basis of the participatory planning, often suggestion and option given by the people improves technical and economic efficiency of the project and suggested improvements proposals (if adopted by the project) of the people also generates sense of ownership within communities thus eases implementation process.

A.8 INFORMATION DISSEMINATION

- While conducting tree enumeration and inventory of road side environmental features (**hot spots**), the consultant has also conducted information dissemination by one to one campaigning about proposed improvement,
- Potential project affected families were consulted to inform them about proposed road improvement program and possible environmental conflict such as tree cutting, relocation of hand pumps,
- Pictorial Methods were adopted to explain proposed improvement and possible environmental impacts in the concerned villages,

- Information dissemination through pumhlet / *Khadapatralu* among the villagers explaining proposed road improvement.

A.9 ANALYSIS OF ALTERNATIVES

At four locations, Kavtaram (km18/500 to km20/500), Gudlavalleru (km22/0 to km23/600) , Gudivada (km 35/200 to km 37/500) and Nuzvid (km79/500 to 83/500), the existing alignment, passes through congested areas. All four sections were investigated for bypass provision based on detailed reconnaissance surveys carried out along the project road. The information and proposals summarized below:

Pedna Village: As suggested by client already identified alignment from Bantumilli road to project road is included as Pedna bypass. The start (jn. with Bantumilli) Chainage of bypass is assumed as km 7.0 and end point of bypass is meeting the project road at existing km 9/4.

Kavutharam: Around one km length, from km 19/500 to km 20/500, project road passes through very congested areas of Kavatharam village. There are five sharp curves/ bends along the alignment. The railway track (Rajahmundry – Machalipatnam line) runs, on south of the village, parallel to the project road at around 800m distance south of the Kavatharam village. Hence village is getting extended towards south side and there is hardly any open space through which bypass alignment can be proposed. In such scenario, the only alternative available is to take the alignment on northern side of village. The existing project road, constraints on south side and proposed bypass alignment on north side of town is discussed in detail in Feasibility Report. It is concluded that bypass alignment is proposed on RHS (north side) of existing road at Kavatharam village.

Gudlavalleru: Around 1.0 km length, from km 22/000 to km 23/000, project road passes through congested area of Gudlavalleru town. The geometric along the existing alignment are acceptable and one bridge over Palleru Canal is under construction (as part of Headwork's, by Irrigation and CAD Department). Once bridge is opened for traffic movement would be smooth. The ROW in this stretch varied from 25.0m to 32.0m and presently the existing road, in the main town, is having 12m wide carriageway. However, between km 23/700 to km 24/300, two private buildings on LHS and two government buildings on RHS need to be acquired for improvement of geometric. Hence, it is proposed to improve the geometrics with the available roadland width and provide lined drains within the built-up area of Gudlavalleru town.

Gudivada: Around 2.3 km length of the project road section from km 35/200 to 37/500, road traverses through the congested area. There is a four lane portion existing from Km 35/200 to Km 36/900 and the remaining part from Km 36/900 to 37/500 is of two lane. There is no much congestion observed on this four lane / two lane portions. The geometrics are straight and acceptable in these portions. In such scenario, **bypass at this portion of Gudivada town is not essential.**

Nuzvid: Around 3.0 km length, from km 80/500 to 83/500, road traverses through the big and congested town of Nuzvid and there are three sharp curves /bends along the alignment. Because of too much congestion and sharp / blind curves, local administration has earmarked around 2km of the project road through town, for one-way movement and for reverse direction, one town road is being used. Through town portion, owing to ROW restriction and abutting commercial/ residential structures, improvement of geometric is not at all advisable. In such scenario, bypass at Nuzvid is very much essential.

A.10 POTENTIAL IMPACT

Table 2 below presents the general environmental impacts expected due to the proposed upgradation of the project road. Impacts have been assessed based on the first hand information collected from the screening & scoping of environmental attributes. The quanta of all the impacts on Natural Environment are analyzed in detail.

Table 2: General Impacts on Natural Environment

Project Activity	Planning and Design Phase	Pre-construction Phase		Construction Phase					Road Operation	Indirect effects of operation or Induced development
Env. component Affected	Land acquisition	Removal of Structures	Removal of trees and vegetation	Earth works including quarrying	Laying of pavement	Vehicle & Machine operation & maintenance	Asphalt & crusher plants	Sanitation & Waste (labour campus)	Vehicle operation	
Air		Dust generation during dismantling	Reduced buffering of air and noise pollution, Hotter, drier microclimate	Dust generation	Asphalt odour	Noise, dust, pollution	Noise, soot, odour, dust, pollution	Odour / smoke	Noise, dust, pollution	other pollution
Land	Loss of productive Land	Generation of debris	Erosion and loss of top soil	Erosion and loss of top soil		Contamination by fuel and lubricants Compaction	Contamination Compaction of soil	Contamination from wastes	Spill from accidents Deposition of lead	Change in cropping pattern
Water	Loss of water sources	Siltation due to loose earth	Siltation due to loose earth	Alteration of drainage Break in continuity of ditches Siltation, Stagnant water pools in quarries.	Reduction of ground water recharge area	Contamination by fuel and lubricants	Contamination by asphalt leakage or fuel	Contamination from wastes Overuse	Spill Contamination by fuel, lubricants and washing of vehicles	Increased contamination of ground water
Noise		Noise Pollution	Noise Pollution due to machinery	Noise Pollution		Noise pollution	Noise Pollution		Noise Pollution	Noise pollution
Flora		Loss of Biomass		Lowered productivity Loss of ground for vegetation		Removal of vegetation	Lower productivity Use as fuel wood	Felling trees for fuel	Impact of pollution on vegetation Lowered productivity Toxicity of vegetation.	
Fauna			Disturbance Habitat loss	Disturbance		Disturbance	Disturbance	Poaching	Collision with traffic	Distorted habitat

A.11 AVOIDANCE, MITIGATION & ENHANCEMENT

Prevention or avoidance of impact is better than mitigation of impact. Hence avoidance and reduction of adverse impacts approaches were adopted during the design stage through continued interaction between the design and environmental teams. This is reflected in the designs of the horizontal & vertical alignment, cross sections adopted, construction methods and construction materials. In-depth site investigations have been carried out so that sensitive environmental resources are effectively avoided, leading to the environmentally best-fit alignment option. As a result many of the trees, cultural properties, water bodies etc. have been avoided at the design stage itself, as presented in Table 3 below.

Table 3: Environmental features saved through Avoidance measure at design stage

Environmental Features	Potential Impact	Under Direct Impact	Saved through alignment design
Trees (nos.)	2580	1957	623
Surface Water source	32	6	26
Ground Water source	15	4	11
Schools and Hospitals	28	1	27
Sensitive Cultural Properties	72	10	62
Bus Shelters	30	10	20

A.12 ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan (EMP) deals with the implementation procedure of the guidelines and measures recommended to avoid, minimize and mitigate environmental impacts of the project. It also includes management of measures suggested for enhancement of the environmental quality along the highways.

The institutional arrangement made under project will look into the implementation of project as well as EMP and the various legal settings applicable to the project are briefly stated in chapter 3.

The avoidance, mitigation & enhancement measures for protection of the environment along highways have been discussed in detail in previous chapter. Although the social environmental impacts, its mitigation and management is an essential component of the EMP, this chapter excludes it for the purpose of clarity and procedural requirements. Social environmental elements have been separately dealt in separate volume namely, Resettlement and Rehabilitation Action Plan (RAP).

A.13 OBJECTIVE OF EMP

The EMP is a plan of action for mitigation / management / avoidance of the negative impacts of the project and enhancement of the project corridor. For each measure to be taken, its location, timeframe, implementation and overseeing / supervision responsibilities are listed. These components of the EMP have been given in Chapter 9 which explains the environmental issues and the avoidance/ mitigation/ minimization or enhancement measures adopted and/or to be adopted during different phases of the project. It also provide the references for the suggested measures, responsible agency for its implementation/ management as well as its timeframe.

A.14 COST ESTIMATES FOR ENVIRONMENTAL MANAGEMENT

Mitigation measures proposed in the EMP will be implemented by the Contractor. The works to be undertaken by the Contractor have been quantified and the quantities included in the respective BOQ items such as earth works, slope protection, noise barriers, road safety features, and shrub plantation.

Provisional quantities have also been included for additional measures that may be identified during construction and for silt fencing which will depend on the Contractors work methods and site locations. Items and quantities have also been included for enhancement measures.

More general environmental management measures to be followed by the contractor have been included in the specifications and this EMP. These cannot be quantified and are to be included in the contract rates. A total of **Rs. 70,09,000/-** has been allocated for the environmental management for the Project road.

A.15 ORGANIZATIONAL FRAMEWORK

The proposed project will be implemented by APRDC through its Environmental Management Unit (EMU). The EMU comprises of officers from Department of Forest, GoAP, and other environmental Engineers. The EMU will be coordinating with the field level implementing agencies

such as Engineer (Supervision Consultant), Contractor and field level APSHP officials. Role and responsibilities of important officials is detailed in chapter 9.

ORGANISATIONAL FRAMEWORK OF PIU - APRSP

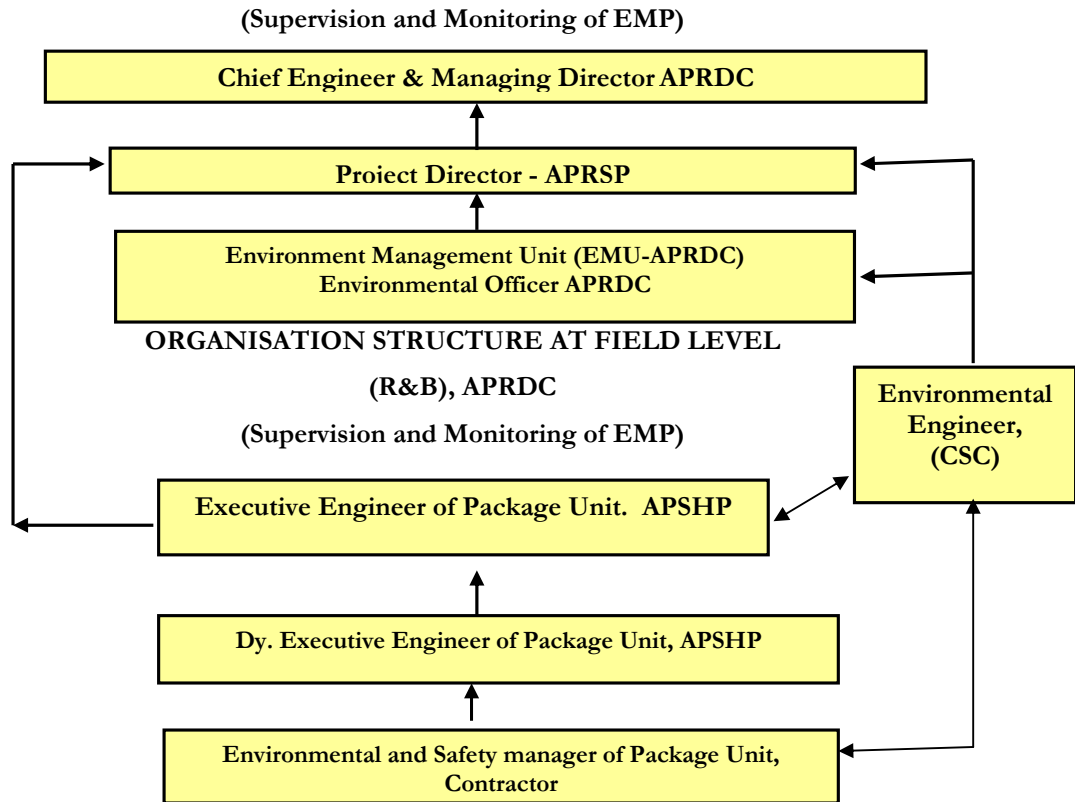


Fig. 1: Organization Framework